Bridging the divide between standardisation and individualisation of care to minimise on-the-day surgery cancellations.

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Health Services Management Centre

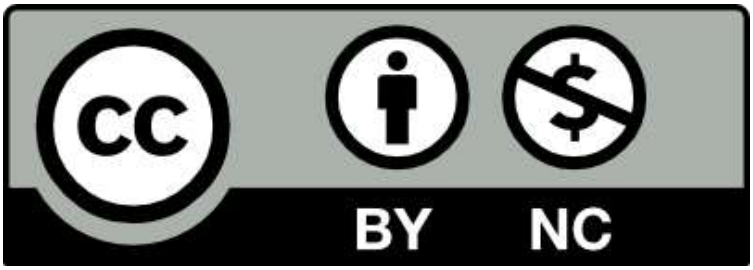
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Abstract

Reasonably high levels of unintended outcomes (e.g., hospital-acquired infections, delayed discharges, wrong diagnosis, surgery cancellations) in Healthcare Delivery Systems (HDSs) are a global problem. Standardisation of care has been seen as a panacea to minimising unintended outcomes and improving healthcare. Care delivery in modern HDSs has become dominated by various forms of standardised care, such as care pathways, interventions, terminology, protocols, checklists, targets and best practice guidelines. Nonetheless, finding a 'standard patient' in a real care setting is hard. Individualised care delivery approaches, careful understanding of patient needs, and individualised diagnoses and treatment plans are fundamental to minimising unintended outcomes and improving healthcare quality.

To understand how standardisation and individualisation of care influence unintended outcomes, the thesis investigates On-The-Day Surgery Cancellations (OTDSCs), a widely reported long-standing problem in Scheduled Surgical Care Systems (SSCSs). An OTDSC is defined as any surgery appointment cancelled on the scheduled day. The study design comprises five phases and uses a realist methodology. The study used a multi-method approach for theory gleaning and refining: incorporating examining literature related to OTDSCs (n=55), findings on the feasibility study including results from eight NHS trusts, two feedback events with patient representatives (n=6), eight expert practitioners (n=8), and 28 semi-structured interviews conducted in a "teacher–learner style" with healthcare professionals.

The iterative analysis identified OTDSCs resulting from clinical reasons as a complex phenomenon dependent on closely connected variables: micro-context (i.e., clinical autonomy), standardised clinical care planning interventions, individualisation of care related to clinical care planning, and behavioural mechanisms (i.e., compassion, self-efficacy, trust and situational awareness). The realist investigation found that OTDSCs resulting from clinical reasons were preventable through minimising

tensions between the standardisation and individualisation of care. The study contributes to knowledge by developing a taxonomy and transferable explanations of how and in what contexts OTDSCs, for clinical reasons, are reduced, developing a reporting tool to categorise OTDSCs that can be useful in minimising OTDSCs.

By using findings relating to OTDSCs for clinical reasons, the thesis contributes to knowledge in academic research about the impact on standardisation and individualisation of care in HDSs. The thesis synthesises a theory explaining how individualisation and standardisation of care work together to minimise unintended outcomes that could be used in other HDSs. Behavioural mechanisms activated by the clinical autonomy of clinical actors, namely compassion, self-efficacy and situational awareness, play a vital role in enabling standardisation and individualisation of care to work together.

Despite the polarised nature of standardisation and individualisation of care, the thesis findings are associated with the concept of “individualised standardisation” Despite the significant reliance on standardisation of care, it is not a ‘universal’ or simple solution to minimise unintended outcomes. One of the main recommendations emerging from the study highlighted the need to caution policymakers on over relying on the standardisation of care to minimise unintended outcomes and improve quality instead of maintaining a judicious balance between standardisation and individualisation of care delivery in HDSs.

Acknowledgements

Words cannot express the sincere love and gratitude of everyone who supports me in undertaking this important research. Without my dearest wife and daughter's patience, encouragement, and support, I could not have undertaken this important research. My mother and father lived more than six thousand miles away from me, but they have been incredibly supportive of me at every step of my life and in completing this research project. I wanted to take this opportunity to acknowledge all the love, kindness and support my dearest wife, daughter, mother, and father offered me during my doctoral studies.

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My master's studies in the Health Service Management Centre (HSMC) at the University of Birmingham have transformed my thinking from a laboratory-based scientist to a researcher interested in real-world social phenomena (i.e. social and implementation science). I wanted to thank the academic staff at HSMC for transforming my thinking. Consequently, I became interested in social science and secured a doctoral research fellowship award from NIHR. I would also like to thank NIHR for funding through a doctoral research fellowship award. The views expressed in the submitted work are based on my own and do not represent or influence the funder.

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Abbreviations

ASA	American Society of Anaesthesiologists
CMOC	Context–Mechanism–Outcome Configuration
COPD	Chronic Obstructive Pulmonary Disease
CR	Cancellation Rate
DGH	District General Hospital
DH	Department of Health
DNA	Did Not Attend
EBM	Evidence-Based Medicine
EPR	Electronic Patient Records
FHTO	From Home To Operation
GA	General Anaesthesia
GP	General Practitioner
HDS	Healthcare Delivery System
HDU	High Dependency Unit
HRA	Health Research Authority
HRG	Health Resource Group
ICAMO	Intervention Context Actors Mechanism Outcome
ICD	International Classification of Diseases
ICU	Intensive Care Unit
IL	Institution Logic
IOM	Institute of Medicine
LA	Local Anaesthetist
LOS	Length of Stay
MMAT	Mixed Methods Appraisal Tool
MRC	Medical Research Council
NPO	Nil Per Os
OT	Operating Theatre
OTDSCs	On The Day Surgery Cancellation
PACU	Post-Anaesthesia Care Unit
PCPP	Pre-Operative Care Planning Protocol

POC	Pre-Operative Clinic
PON	Pre-Operative Nurse
PPI	Patient Public Involvement
RAMESES	Realist and Meta-narrative Evidence Syntheses: Evolving Standards
RCT	Randomised Control Trial
RSI	Resource Separation Intervention
SSCS	Scheduled Surgical Care System
SPP	Structured Pre-operative Protocol
WHO	World Health Organisation

A glossary of terms is given in Appendix 1

1 Introduction Chapter

1.1 Introduction to thesis

Despite the ingenuity of administrators, policymakers and clinicians, there is strong evidence that a significant number of unintended outcomes are reported in Healthcare Delivery Systems (HDSs) all over the world. An unacceptably high number of prescription errors, surgery cancellations, infections and patient safety incidents have been reported globally (Berwick et al., 2018; Wong et al., 2018; Weprin et al., 2021; Miller et al., 2007). In developed countries, the complication rates in patients undergoing inpatient surgery can be around 22% and half of these incidents are arguably preventable (WHO, 2009). Unintended outcomes create enormous suffering for patients and carers and can be expensive (Andel et al., 2012; Walsh et al., 2017).

High levels of unintended outcomes in HDSs mean healthcare does not improve health in patients. From service users' perspectives, it creates many additional problems and can occasionally lead to significant harm in addition to increasing further suffering. From a provider and policymakers' perspective, the damage done due to unintended outcomes needs to be repaired, forestalled or mitigated; while that is vital and honourable work, on most occasions, it is a largely reactive and expensive exercise. For example, almost 15% of hospital expenditures in Organisation for Economic Cooperation and Development (OECD) countries are attributed to patient safety related functions (Leatherman and Berwick, 2020). Standardisation of care is considered the solution to minimise unintended outcomes and improve healthcare outcomes.(Smith, 2009; Leotsakos et al., 2014; Rozich et al., 2004).

The last three to four decades have witnessed the “industrialisation of medicine”, whereby policymakers have increasingly relied upon standardisation of care to minimise unintended outcomes and improve quality (Pfaff et al., 2010). Many sociologists have documented how standardisation has come to dominate all social systems: Questioning this sometimes feels like questioning a divine authority (Timmermans and Epstein, 2010; Reiger and Morton, 2012). As the management of healthcare systems has increasingly shifted to models of standardisation, modern care settings have become dominated by various forms of standardised care, such as care

pathways, terminology, protocols, checklists, targets, and best practice guidelines. However, such approaches are not without their limitations. Finding “standard” patients, or even standard Health Care Professionals (HCPs), is nearly impossible in ageing and diverse patient populations. This begs the question: why does care delivery rely so heavily on standardisation if we do not have “standard” patients and HCPs? While compelling evidence from some healthcare settings and other industries suggests that standardisation can minimise unintended outcomes and improve the overall provision of quality and safety, there is a growing demand for individualisation of care (Suhonen et al., 2007; López-Domingo and Rodríguez-Martín, 2021). Furthermore, patients frequently see themselves and are seen by clinicians as “co-producers” in their care, and either patients volunteer or are asked to participate in their care actively (Mannion and Exworthy, 2018). Real practice individualised approaches that can clash with standardised imperatives(Reiger and Morton, 2012). Individualised care delivery approaches are fundamental to minimising unintended outcomes and improving healthcare quality (Berwick, 2009).

Some scholars claim that standardisation and individualisation are divergent and opposing approaches (Kvæl et al., 2022; Rostgaard, 2012a; Mannion and Exworthy, 2017). Some have sought to question why they exist simultaneously in HDSs despite their supposed opposing nature(Needham, 2018), while others argue that they co-exist productively in modern HDSs (Ansmann and Pfaff, 2018).

While both standardisation and individualisation are important paradigms influencing the quality of HDSs, there is a dearth of research considering how and why these approaches to care co-exist and how their co-existence influences healthcare quality (Mannion and Exworthy, 2017; Ferlie, 2017; Needham, 2018; Kvæl et al., 2022). As Kvæl puts it, “There is an urgent need for a clearer understanding of the tension between standardisation and individualisation in transitional care pathways…to ensure better healthcare quality for patients and more realistic working environments for healthcare professionals” (Kvæl et al., 2022, p. 1).

1.2 The aims and research questions

To understand how standardisation and individualisation of care influence unintended outcomes, this study investigates On-The-Day Surgery Cancellations (OTDSCs), a widely reported long-standing unintended outcome in Scheduled Surgical Care Systems (SSCSs). OTDSCs have been a long-standing global problem, with global prevalence as high as 18%(Abate et al., 2020).

The study's long-term aim is to develop a theory-driven, evidence-based intervention to minimise other unintended outcomes of OTDSCs in HDSs.

RQ1. How can OTDSCs be categorised and used in a wide range of SSCSs?

RQ2. How and in what contexts can OTDSCs for clinical reasons, be minimised?

RQ3. How can Programme Theory(PT) be used in a wide range of SSCSs to minimise OTDSCs for clinical reasons?

RQ4. How and in what contexts do the interactions of standardisation and individualisation of care influence unintended outcomes in HDSs?

1.3 Research motivation

In this short section, I write in the first person to describe my motivation for carrying out this study and my personal impetus to develop evidence-informed practices to minimise unintended outcomes.

I have worked as a scientist and leader in the NHS for more than ten years, providing leadership to various NHS organisations at regional and national level to improve various aspects of healthcare quality in scheduled care systems. In my time working for the NHS, I have witnessed many patients experience a range of unintended outcomes, such as OTDSCs, incorrect blood transfusions, prescription errors, medical errors, delayed discharges and hospital-acquired infections. Despite various national and organisational efforts to minimise unintended outcomes,

particularly by hard-working and stretched HCPs and leaders, patients continue to suffer from unintended outcomes, leading to valuable healthcare resources being wasted. Frequently, I have seen significant adverse impacts of unintended outcomes affecting patients and carers, including serious economic impacts, and witnessed the demoralising effect this has on HCPs. I am therefore motivated to understand why unintended outcomes are common and to contribute to knowledge on minimising these. Professionally, completing doctoral studies allows me to broaden my knowledge and ability to play an influential role in improving patient care in the NHS.

My years of experience have taught me that, to improve patient care, it is important to embrace the enquiry's complexity or "reality" to provide solutions to very complicated and dynamic problems rather than ignoring complexity in HDSs. Inspired by leading academics who embrace complexity, such as Jeffery Braithwaite, Trish Greenhalgh and Ray Pawson, I endeavoured to embrace this approach in both practice and research, studying OTDSCs to make a small contribution to knowledge and a wider contribution to the healthcare economy. As such, the main motivation informing my methodological approach has been to improve healthcare quality by embracing complexity and contributing to evidence-informed approaches to minimise unintended outcomes in NHS services in England and elsewhere.

1.4 Overview of the research process

The study followed a detailed protocol which is registered with the International Prospective Register for Systematic Reviews (PROSPERO) database [Ref: CRD42019124272].

The contents of the five phases of the research process are now briefly outlined. A detailed account of each research phase can be found in Chapter 3.

The study developed its research aims, questions and design in phase one.

Phase two developed initial programme theories (IPTs) using theory gleaning and refining using multiple methods, including purposive literature searches for OTDSCs. In the first instance, preliminary IPTs were developed using a purposive sample of

OTDSC literature (n=35). Second, the identified preliminary IPTs were further refined using multiple methods. The findings of the feasibility study included eight NHS trusts, two feedback events with patient representatives (n=6), and theorising with eight expert practitioners (n=8). Phase two ended with identification of four IPTs and a discussion of the rationale for prioritising one IPT.

In phase three, 28 semi-structured interviews were conducted with a wide range of clinical and non-clinical healthcare workers to refine IPTs. In line with the realist approach, interviews were completed using the “teacher and learner” method (Pawson, 1996; Manzano, 2016). The interview participants consisted of surgeons, anaesthetists, managers and nurses. At the end of phase three, a series of Context–Mechanism–Outcome configurations (CMOCs) are developed that might influence OTDSCs.

Phase four consisted of five stages of realist synthesis(Pawson, 2006b): defining the scope of the review, searching primary studies using keywords from each IPT, evidence appraisal, extracting data and synthesis. At the end of phase three, the CMOCs identified in phase three were validated.

Phase five consisted of using an iterative analysis to combine the findings of all the preceding phases and all the CMOCs to answer the research questions set out in phase one.

The overall study presents novel and transferable contributions to knowledge by developing a Programme Theory (PT) to be used in a wide range of SSCSs to minimise OTDSCs for clinical reasons. Using OTDSCs as a case study, the study concludes by developing a refined theory and making recommendations on managing the interplay between standardisation and individualisation of care to minimise unintended outcomes and improve quality in HDSs.

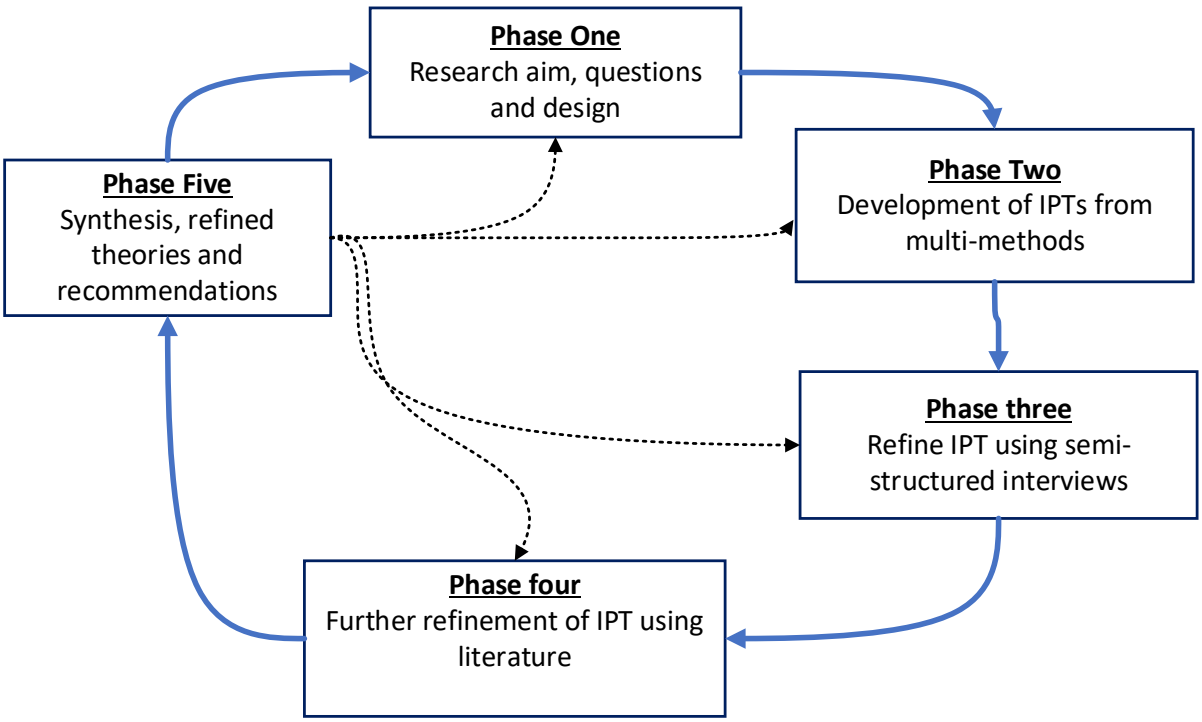


Figure 1.4-1 Five phases of the research process.

Figure 1.4-1 illustrates the summarised five-phased research process used to address the research questions. The blue continuous lines with arrows indicate the sequence of how each phase was completed. The dotted line with black arrows shows how the iterative analysis revisits all other five phases in the final phase of the process.

1.5 Overview of the thesis chapters

The contents of each chapter of this thesis are now briefly outlined.

Chapter 1 introduces the study's key concepts and provides an overview of the thesis.

Chapter 2 presents the theoretical underpinning for the thesis and the research setting in which research is conducted. The chapter begins by explaining the overarching dynamics between the unintended outcomes, standardisation and individualisation of care. The second section provides an overview of a summary of various concepts identified during the explorative empirical investigation: clinical autonomy, self-efficacy, situational awareness and compassion. The third section explains the setting of the research investigation: an overview of the policy

landscape in SSCSs in general, and in the NHS. The fourth section explains the unintended outcome under investigation – OTDSCs.

Chapter 3 describes the philosophical assumptions, with specific attention given to the realist methodology. In particular, the justification behind the methodology used to answer the research questions is presented. The chapter also explains how various realist principles are applied, including a detailed description of each of the study phases and methods used. This research study conceptualises that actor (e.g., anaesthetists, nurses, surgeons, patients and administrators) and contexts (i.e., micro, meso and macro) can influence the inner workings of standardised interventions (e.g., standardised clinical care planning interventions) and create tension between the standardisation and individualisation of care to prepare patients for surgery (refer section 3.2 for further information). Consequently, it leads to unintended outcomes such as OTDSCs. The standardised clinical care planning interventions referred to as several terminologies: clinical protocols, reassessment tools and checklist and pre-operative care tool (refer section 2.3 for further information).

Chapter 4 set out the findings of phase two of the study, which considered the literature related to OTDSCs using different types of empirical data (i.e., expert practitioners and feedback from patient experts) that identify four IPTs. By undertaking a multi-methods research approach, Chapter 4 theorises that, although OTDSCs are influenced by a wide range of interconnected variables and all three types of contexts (macro, meso and micro), managing tensions between standardisation and individualisation of care is vital to minimise OTDSCs. The end of Chapter 4 sets out a taxonomy developed to make sense of different types of OTDSCs and provides a rationale to prioritise IPT related to clinical reasons for further refinement.

Chapters 5 and 6 explain the findings of phase three and present CMOCs that influenced OTDSCs through iterative analysis based on the 28 semi-structured interviews conducted with a wide sample of healthcare actors.

Chapter 7 presents the findings of phase four, the realist synthesis, including the search strategies, study selection using exclusion and inclusion criteria, data extraction, analysis and synthesis.

Chapter 8 is the discussion chapter related to phase five, which brings together the findings of all the chapters. The chapter expands upon the research findings to develop a theoretical framework consisting of six interconnected components that respond to the main research question of this study, and the findings are compared with other relevant literature. The chapter discusses the strengths, weaknesses, limitations and future research directions from the study, and ends with a summary of personal reflections.

Chapter 9 presents the conclusion to the thesis, answers the research questions set up in phase one and highlights the contribution to knowledge this thesis makes in understanding and minimising OTDSCs. The chapter also presents a reporting tool to categorise OTDSCs, which can play a useful role in minimising OTDSCs. Finally, it discusses the implications for practice and policy, including recommendations that target different actors in the healthcare economy, such as policymakers, hospital leaders, HCPs and researchers.

2 Chapter - Overall theory and research setting

2.1 Introduction to Chapter

This chapter sets the scene for the thesis, explaining the overall theory and research setting in which the research is conducted. The chapter consists of four sections.

The first section explains the dynamics between unintended outcomes, standardisation and individualisation of care. Neither patients nor healthcare providers want unintended outcomes in their care. However, such outcomes are relatively common, creating suffering for patients AND wasting valuable healthcare. Unintended outcomes in HDSs are a global problem – most HDSs recorded unintended outcomes, some more than others. Standardisation of care is seen as one of the most important, if not the universal, solution to minimising unintended outcomes and improving the quality of HDSs while maintaining interconnected dynamics in modern HDSs.

Standardisation of care exists and dominates in many forms in modern HDSs. Nonetheless, research evidence has inconsistently determined the extent to which this emphasis on standardisation minimises unintended outcomes and improvements (Katz-Navon et al., 2007; Leape and Berwick, 2005). Some argue for the importance of individualisation of care or similar concepts (patient-centred care or person-centred care) in HDSs. Many scholars have highlighted the urgent need to understand how the importance of understanding the dynamics of standardisation and individualisation of care influences modern HDSs (Ansmann and Pfaff, 2018; Kvæl et al., 2022).

The second section provides an overview of various concepts identified during the explorative empirical investigation: clinical autonomy, self-efficacy, situational awareness and compassion. The third section explains the care setting related to the research investigation and summarises the policy landscape in SSCSs in general, the promise of standardisation of care in SSCS. Like many other HDSs, the policy

landscape for SSCSs in the NHS is influenced by many socio-economic factors, high demand and concerns about high levels of unintended outcomes. Most countries are grappling to reduce waiting lists related to scheduled surgical care while maintaining efficient use of resources. As with many other HDSs, standardisation of care is seen as the universal solution to manage these interconnected dynamics and deliver intended outcomes while minimising unintended outcomes in SSCSs.

The fourth section explains the unintended outcome under investigation – OTDSCs – discussing the mainly negative impact of OTDSCs, which result in suffering and inconvenience for patients and their carers, wasting valuable healthcare resources, and noting the multi-factorial nature of OTDSCs.

2.2 Unintended outcomes, standardisation and individualisation of care

This section explains the significance of the identified research topic and the three important theoretical concepts (unintended outcomes, standardisation and individualisation of care) related to the enquiry.

2.2.1 Unintended outcomes

Although many service delivery systems want to create intended outcomes, they also end up creating unintended outcomes. When a patient visits a healthcare provider for surgical treatment, they expect intended outcomes. For example, scheduled care patients undergoing surgery are expected to undergo surgery as scheduled, and undergo treatment and post-operative care, subsequently being discharged without delays. Sometimes, patients undergoing surgery can experience unintended outcomes such as OTDSCs. On some occasions, various unintended clinical complications or incidents occur (i.e., medication errors, hospital-acquired infections, delayed discharges). Many unintended outcomes reported in surgical care were related to the patient journey, including medication, preparation, administration and registration (van Wagtendonk et al., 2010).

In numerous forms, the problem of unanticipated consequences of purposive action has been widely discussed throughout history using various terms and contexts (Merton, 1936). Events can be unorganised, individually, or officially organised, and both may produce unintended consequences (Merton, 1936). Scholars use significant variations of terms related to unintended outcomes include unintended or unanticipated effects, or undesirable (Suchman, 1968; Jabeen, 2016). The term unanticipated consequences, coined by Robert K. Merton (1936), has generally been swapped in current social science by its known synonym, unintended consequences, or outcomes(Jabeen, 2018; De Zwart, 2015).

It is acknowledged that the first significant recognition of the term unintended outcomes in evaluation was coined by Suchman (1968). The changes that programmes are intended to generate are stated to as the "intended outcomes". In contrast, any other effects or outcomes of an intervention which were not function or part of the initial intention are "unintended outcomes" (Jabeen, 2018).

For programme evaluation, such unintended outcomes could be categorised based on their knowability, value, distribution and temporality (Jabeen, 2018; Merton, 1936). Merton (1936) identified five sources of anticipated but unforeseen unintended outcomes: error, ignorance, basic values, imperious immediacy of interest, and self-defeating predictions. Unintended effects or outcomes of social programmes do not always occur due to error or ignorance (Jabeen, 2018). For example, encouraging working mothers to participate in productive domains without explicit efforts to change the caring role may increase women's burdens. Yet, this is by and large neglected when designing programmes or interventions (Grasmuck and Espinal, 2000). Another example is that although there are rare occasions that HCPs harm patients intentionally, on most occasions, they want to minimise unintended outcomes such as prescription errors, misdiagnosis and OTDSCs. Key sources of preventable patient harm (i.e., unintended outcomes), could include the actions of HCPs, healthcare system failures, or involve a combination of oversights made by individuals, HDSs failures, and patient characteristics (Panagioti et al., 2019).

Despite the continuous efforts and ingenuity of administrators, policymakers and clinicians, there is strong evidence that a significant number of unintended outcomes are reported in HDSs all over the world (Berwick, 2022). Unintended outcomes due to injuries related to patients' safety alone take as many lives as tuberculosis or malaria globally (Berwick et al., 2018). An unacceptably high number of prescription errors, surgery cancellations, infections and delayed discharges have been reported globally (Stelfox et al., 2006; Miller et al., 2007; Wong et al., 2018; Rojas-García et al., 2018). Surgical care-related infections are responsible for 14% to 17% of all hospital infections (Weigelt et al., 2010; Spagnolo et al., 2013). In developed countries, the unintended complication rates in patients undergoing inpatient surgery can be around 22%, and half of these incidents are arguably preventable (WHO, 2009). Unintended outcomes lead to enormous suffering for patients and carers and can be an expensive waste of valuable healthcare resources (Andel et al., 2012; Walsh et al., 2017). Many practising HCPs are dismayed by broad statements about eliminating unintended outcomes but may be more keen to discuss substantially reducing the risk of, or eliminating entirely, preventable unintended outcomes(Nabhan et al., 2012).

The manufacturer-based approach defines quality as “conformance to specifications” where quality may meet or exceed the customer’s expectations (Gilmore, 1974; Deming, 1986a). However, quality in HDSs is a multi-dimensional concept compared to the manufacturing industry, where different professionals compete for the ownership and definition of quality in healthcare (Øvretveit, 1997). To improve quality, organisations need to develop processes that aim simultaneously to reduce unintended outcomes (i.e., errors or defects) while increasing the desired outcomes. The relationship between managing variation using standardisation appears to be an essential approach to improving quality and minimising unintended outcomes (Deming, 1986; Lander and Liker, 2007; Litvak et al., 2005). However, inspired by various commercial industries, standardisation of care is considered the universal solution to minimise unintended outcomes and improve quality, including HDSs (Rozich et al., 2004).

2.2.2 Standardisation of care

Timmermans and Berg (2010) refer to standardisation as the process of “rendering things uniform”. Standards are considered “the outcome” of such processes in this definition. Standardisation is “the process of developing, agreeing upon and implementing uniform technical specifications, criteria, methods, processes, designs or practices that can increase compatibility, interoperability, safety, repeatability and quality” (Leotsakos, 2014, p. 111). Timmermanns and Epstein (2010) argue that standardisation of care exists in various sizes and shapes and present a taxonomy consisting of four sub-types to explain organisational standardisation processes: design, terminological, performance and procedural standards.

Design standards can be explicit and provide the structural framework or specification of care that defines care delivery features. A good example of design standards is that of clinical guidelines developed with the help of the evidence-based medicine (EBM) movement. Terminological standards represented by, for example, the health resource group (HRG) or the International Classification of Diseases (ICD) ensure that a consensus exists across healthcare economies. Performance standards refer to various process and outcome specifications, such as acceptable waiting times for scheduled surgical procedures or maximum acceptable survival or mortality rates. Procedural standards refer to the sequence of steps taken to deliver a cohort of patients or disease management programme HDSs widely reliant on procedural standards to deliver care – for example, use of a clinical protocol, clinical assessment, checklist, algorithm or process improvement tool to enable care delivery.

The EBM movement’s clinical standards aim to improve healthcare quality by ensuring that medical decision-making is not dependent on clinical autonomy. Instead, clinical decisions should be based on high-quality evidence derived from “gold standard” research findings from randomised controlled trials and meta-analyses (Berg and Berg, 1997). EBM is used to identify the best clinical practices to deliver care and design various care tools such as guidelines, protocols, checklists and assessment tools. Standards can be explicit and formal and therefore have a

certain authority attached to them and the capacity to regulate behaviours (Timmermans and Epstein, 2010). Various monitoring practices, including clinical audits, are used to measure compliance, maintain adherence to clinical guidelines and promote standardised organisational practices and behaviours (Lord and Littlejohns, 1997).

Despite significant investment in EBM and endorsement from professional bodies, reviews have shown low adherence to clinical guidelines among healthcare professionals (Jeffery et al., 2015; Donnellan et al., 2013). In practice, healthcare professionals rarely follow guidelines, working instead with their local context and using tacit knowledge acquired during their training (Gabbay and le May, 2004). Managers tend to believe in standardisation of hospital practices to reduce unintended or unwanted outcomes and improve patient safety, while clinicians see patient safety based on the validity of professional judgement and art (Waring et al., 2016).

In the last two to three decades, driven by policymakers, healthcare providers have tried to implement the four sub-types of standardisations of care that have worked well in manufacturing industries. Going further, most organisations have adopted improvement approaches used in standardisation of care, such as Lean Six Sigma (DelliFraine et al., 2010). Various attempts have been made to integrate some of these standardised improvement approaches into healthcare settings, including variability methodology (Litvak et al., 2001) and care pathways (Schrijvers et al., 2012). The theoretical assumption behind the use of standardisation of care is that it reduces variation from all sources, including in quality, quantity and timing (Schmenner, 2015). The dominant logic of standardisation of care for each patient is that patients should be processed in the same prescribed way irrespective of individual values to comply with institutional standards (Timmermans and Berg, 1997; Mannion and Exworthy, 2017). Traditionally, when patient safety is compromised, the main cause is mostly found to be inadequate standardisation and lack of safety procedures (Katz-Navon et al., 2007). Despite the efforts of policymakers and the endorsement of royal colleges and many other professional

groups, in practice, standardisation of care is hard to achieve in HDSs (Borges et al., 2019; Katz-Navon et al., 2007).

Despite efforts to standardise care leading to assembly lines and factory-like systems, many argue that hospitals are more than factory-like systems (Rouse and Serban, 2014; Morton and Cornwell, 2009). Scholars argue that different standardisation of care can lead to various unintended outcomes. For example, standardised performance targets can create unintended outcomes that distract and deviate care delivery from patients' vital concerns and needs (Mannion and Braithwaite, 2012a; Powell et al., 2012). Similarly, impacts of the inner workings of procedural standards (clinical protocols, checklists) on patient outcomes are far from linear and can lead to unintended outcomes (Rycroft-Malone et al., 2009; Petrakaki and Kornelakis, 2016; Greenhalgh et al., 2014, 2009).

With a few exceptions, quality management approaches using standardisation of care, such as Lean Six Sigma, have failed to make a sustainable improvement in healthcare quality (D'Andreamatteo et al., 2015; Mason et al., 2015). In real care settings, there are neither standard patients nor processes (Timmermans and Berg, 2010; Katz-Navon et al., 2007). Various complex system dynamics are inherent in HDSs and present significant barriers to implementing approaches to standardised process improvement (Radnor et al., 2012; Radnor and Osborne, 2013). As a result, some argue that there is an implementation problem related to standardisation of care. Consequently, to address the limitations of implementation or implementation problems, various ideas were developed, including accountability frameworks (Zuiderent-Jerak, 2007; Grocott et al., 2019; Massenburg et al., 2017).

The following quote from Hartzband and Groopman (2016, p. 107) attempts to capture the challenges of using standardised process improvement approaches in healthcare organisations:

"If patients were cars, we would all be using cars of different years and models, with different and often multiple problems, many of which had previously been repaired by various mechanics. Moreover, those cars would all communicate in different

languages and express individual preferences regarding when, how, and even whether they wanted to be fixed."

Different sub-types of standardisation of care, including checklists, standardised interventions and EBM, have been fully embraced by policymakers and various influential groups (e.g., royal colleges, academics), but evidence relating to the ability to improve quality and minimise untended outcomes is inconsistent. Many sociologists argue that individualisation results from de-standardisation (Berger et al., 1993; Nordesjö et al., 2020). However, some argue that individualisation of care or other similar concepts minimises unintended outcomes in HDSs (Nordesjö et al., 2020; Sharp et al., 2018).

2.2.3 Individualisation of care

Modern society embodies individualised behaviours such as individual choice, risk, responsibility and personal uncertainty (Lindbladh et al.,1998). Individualism is a political and social cognisance that assigns a high value to the individual's autonomy and generally focuses on self-directed, self-contained, and relatively unrestrained ideas, including ego (Realo et al., 2002). The individualisation of care is regarded as one of the attributes of person-centred care, holistic care considering individuals' needs, experiences, preferences, behaviours, perceptions, feelings, and understandings(Bukecık and Terzioglu, 2021a). The term individualisation is an umbrella term that covers concepts such as customisation and personalisation of care (Pfaff et al., 2010). Charalambous (2018) defined the term individualisation of care as "care delivery which takes into account patients' personal characteristics in their clinical situations (=condition), personal life situation and preferences and promoting patient participation and decision-making in his/her care (=decisional control)" (p. 34). Common themes in the individualised care literature have included the recognition of patients' individual clinical conditions, personal life situations and decisional control over care(Suhonen et al., 2018). The table 2.2-1 illustrates the domains and elements of individualised of care. Although these separate themes are helpful to conceptualise, they are closely intertwined in practice. Individuality in patient care may also be assessed from other viewpoints, such as nurses' perceptions of the individuality of patient care (Leino-Kilpi and Rannikko, 2019; Bukecık and Terzioglu, 2021a).

Patient's clinical situation	**Patient's personal life situation and preferences**	**Patient's participation and decision control**
Healthcare condition including physical and psychological care needs, fears and anxieties	General life situation (employment)	Knowledge about the illness and treatment
Abilities, capacities or resources	Cultural background and traditions	Making choices and having alternatives
Meaning of illness	Family involvement	Expressing own views and proposals

Table 2.2-1 illustration of the domains and elements of individualised care

There is significant evidence in many areas, of a positive relationship between individualisation of care and good patient outcomes (Papastavrou et al., 2015; Suhonen and Charalambous, 2018). Promoting individualised care requires a broader understanding beyond the nurse-patient relationship including contexts that promote care settings (Papastavrou et al., 2015; Bukecık and Terzioglu, 2021). Policymakers widely acknowledge that care delivery needs to incorporate the principle of holism to achieve better patient outcomes and individualisation of care, which share common attributes based on the principles of holism (Suhonen and Charalambous, 2018; Ansmann and Pfaff, 2018).

Recent advancements in human genetics and sequencing technology have helped personalise care or medicine based on individual patients' genomic and molecular profiles, enabling delivery of individualised diagnosis and treatments (Dzau et al., 2016). This approach delivers better patient outcomes and predicts and prevents disease and recovery (Brittain et al., 2017; Dzau et al., 2016).

In the last few decades, healthcare policymakers have encouraged a partnership approach with patients through individualisation of care instead of a clinician-centred decision-making approach (i.e., “doctor knows best”), involving shared decision-making between clinicians, patients and carers. In addition to having clinical skills, healthcare professionals are trained to increase awareness of their behaviors and improve communication skills to provide patient-centred or person-centred care. Various mobile and smart technological advancements were also introduced to improve the individualisation of disease management for long-term conditions (Jeddi, Nabovati and Amirazodi, 2017; Miller, Schüz, Walters and Walters, 2017).

The degree of patients’ satisfaction with their care experiences is an important to measure professional and organisational performance (Dwamena et al., 2012). Some healthcare systems have introduced strategies to improve patient choice, increase care ownership and promote competition between providers. Using personal healthcare budgets, the NHS has given purchasing powers to patients and carers to individualise their care (Forster and Gabe, 2008).

2.2.4 Individualisation and standardisation of care

Individualised care approaches and standardisation are consequently often presented as opposing trends (Berwick, 2009). It is possible to argue that the famous Greek philosopher Socrates favours individualisation, while Plato promotes standardisation (Leino-Kilpi and Rannikko, 2019).

Care settings have become dominated by various forms of standardisation of care, including care targets, standard reporting outcomes, terminology, care pathways, protocols, checklists, and guidelines. The high reliance on standardisation of care in healthcare systems has been created by “tick-box cultures” and “task-based” care (Sharp et al., 2018). Practitioners are compelled to adopt such approaches but, in doing so, are met with added tensions and complexities in delivering care at the frontline. Yet, finding a ‘standard’ patient is nearly impossible in ageing and diverse

patient populations. This reality begs the question: What is the impact of patient care relying so heavily on standardisation if we do not have ‘standard’ patients?

In practice, standardisation or individualisation of care can create various dynamics that can lead to an impact on patients receiving healthcare. HCPs are pressured to complete care using various standardised interventions (e.g., protocols, checklists), while observing standardised time slots for all patients. In the NHS, GPs are given standardised clinic times based on a one-size-fits-all approach. Especially patients with mental health and other complex needs (e.g., comorbidities, cancer, learning disabilities) need more than a 10-minute GP appointment. The pressure to work within standardised clinic times, for example, can often provoke complaints from patients (Pollock and Grime, 2003).

Another example of the simple dichotomy between standardisation and individualisation of care can be found in social care budget allocation. Traditionally, social care budget allocation tends to take a one-size-fits-all approach, where each recipient goes through the standardised process and receives a standard budget. Several developed countries have introduced personalised budget allocation in the last few decades (Glasby and Littlechild, 2009). On most occasions, personalised budgets (i.e., the individualised approach) offer service users and carers a better quality of life through increased control or personal autonomy for decision-making and greater satisfaction with care for people with disabilities (Robinson et al., 2022).

Another example of interaction between the standardisation and individualisation of care can be found in public health interventions. While smoking prevalence in developed countries has overall dropped over the past decades, socioeconomic inequalities in smoking have widened (Nguyen et al., 2023). Current approaches to tobacco control appear to be more standardised and less effective, and there is a need for individualised approaches to reduce prevalence further while minimising the widening of inequalities (Nguyen et al., 2023).

Mannion and Exworthy (2017) have highlighted subtle differences between personalisation, individualisation and customisation and present sharply different ways of organising and delivering care, in comparison to standardisation of care. Lambel and Mintzberg (1996) argued that the need for standardisation and customisation exists at different organisational levels. In contrast, 'local universality' indicates that standardisation and individualisation of care can work in 'harmony' (Timmermans and Berg, 1997). For example, standardised protocols are essential to organisational practice, and working practices transform such protocols. Standardised care assessment can address individualised or patient-centred care by means of mediation and translation between the two approaches (Lydahl, 2021). The convergence from 'sameness' to 'difference' also suggests that these two opposing concepts have the flexibility to work in 'harmony', but critical actors need to 'tinker' with the two concepts to make them work (Dugdale, 1999).

Ansmann and Pfaff (2018) argue that 'individualised standardisation' is a matter of perspective and can exist at macro-, meso- and micro-level in systems, highlighting that, at policy level (i.e., macro-level), propriety involves reducing variation and cost-effectiveness, which standardisation tends to favour, while the focus at micro-level tends to be on various individualised aspects such as patient preference, treatment success and side effects. In addition, many scholars argue that there is a need to understand how standardisation and individualisation of care or similar concepts (personalisation, customisation) interact with each other (Yu and Frempong, 2012; Reiger and Morton, 2012; Ansmann and Pfaff, 2018; Nordesjö et al., 2022; Mannion and Exworthy, 2018; Kvæl et al., 2022). Mannion and Exworthy (2018, p. 573) also highlight that "furthermore, the implementation and impact of hybrid forms (such as mass customisation or individualised standardisation) are under-researched." Ansmann and Pfaff emphasised the importance of exploring "how stakeholders in healthcare balance or decide between standardisation and individualisation together with their patients" (2018, p. 351). As Kvæl (2022) argues, there is an urgent need to understand the tension between standardisation and individualisation of care to improve healthcare quality for patients and better working environments for HCPs.

Despite the efforts of multiple influential groups, unintended outcomes are high in HDSs. Standardisation of care is seen as the universal solution to minimising

unintended outcomes and improving quality and safety (Weiser et al., 2009; Wilhelm et al., 2019; Rozich et al., 2004). However, despite policymakers' efforts and the endorsement of royal colleges and many professional groups, standardisation of care has failed to provide the intended outcomes (Katz-Navon et al., 2007). Many scholars argue that individualisation of care can improve the quality and safety of care while minimising unintended outcomes (Suhonen and Charalambous, 2018; Reiger and Morton, 2012). Standardisation and individualisation of care are fundamental pillars of HDSs, but there is little known about how the interactions between standardisation and individualisation of care influence unintended outcomes. The thesis aims to understand how two fundamental concepts interact HDSs and influence unintended outcomes by investigating OTDSCs. The following figure (2.2-1) is a simplified illustrates how standardisation and individualisation of care interactions lead to unintended outcomes. The arrows in blue in Figure 2.2-1 present the interactions between the three concepts, which are very little is known.

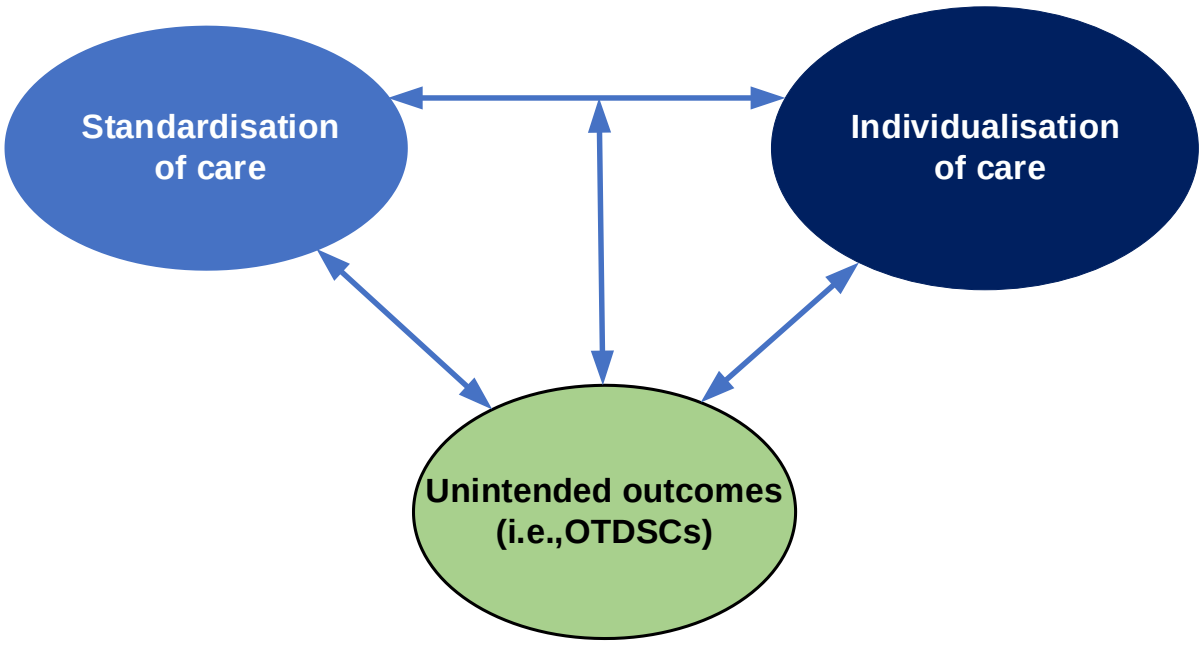


Figure 2.2-1 Simplified conceptualisation of the research investigation

Before exploring the empirical research setting, the next section explains some of the terms used in the thesis.

2.3 Pre-operative care assessments, protocols, checklists and OTDSCs

This research study investigates the tension between standardisation and individualisation of care to study OTDSCs (refer to section 3.2) by focusing on the inner workings of standardised clinical care planning interventions in SSCSs. To set the scene for the thesis, this section provides a critical and in-depth explanation of the tension between standardisation and individualisation in terms of clinical planning standardised interventions (i.e., protocols, checklists and pre-assessment tools).

Several terms (e.g., pre-operative clinical tool, standard toolkit, checklist, protocol, decision tool, algorithm, clinical planning tool) are used in clinical practice to explain standardised clinical care planning interventions. Although these might differ slightly depending on the local context (i.e., organisations and country), they all aim to rely on the principle of standardisation of care to prepare patients for surgery by identifying individual patient risks. To avoid confusion among readers, the thesis considers all these interventions as standardised clinical care planning interventions.

General clinical care planning, other organisational support services and resource allocations are completed using protocols, checklists and pre-assessment tools (Rycroft-Malone et al., 2004). These are referred to as procedural standards– one type of standardisation of care out of four (section 2.2.2). Standardised interventions are used in all stages of scheduled planned care, from referral to discharge, and are considered a one-size-fits-all approach (Gawande, 2010). In essence, standardised care planning interventions (e.g., clinical care planning, communication and scheduling) usually ensure that patients undergoing surgery are fit by identifying and addressing various individual risk factors or vulnerabilities (Turunen et al., 2018).

In surgical care, these standardised clinical care planning interventions, which are the main focus of this thesis (i.e., prioritised and refined IPT), are known by different terminologies, such as pre-assessment care protocols, tool kits, checklists and pre-operative assessments (Ellis et al., 2012; Brazil et al., 2021).

In surgical care, these standardised clinical care planning interventions (protocols, pre-operative care assessments, checklists and pre-assessment tools) helped to identify comorbidities that may lead to patient complications during treatment (surgery or anaesthetic) or after surgery (2.2.1). In some contexts, strengthening clinical care planning interventions such as pre-operative care assessments and checklists has reduced length of stay, resulted in fewer procedures being cancelled and minimised serious post-operative complications (Ellis et al., 2012). Improving pre-operative care minimises OTDSCs and improves patient outcomes, especially for clinical reasons (Kenton et al., 2007; Emanuel et al., 2013). However, very little evidence is available regarding how this can be achieved.

Standardised clinical care planning interventions can help improve the consistency and comprehensiveness (i.e., addressing various clinical issues) of clinical care planning, minimising OTDSCs for clinical reasons (Jiménez et al., 2006). However, systematic reviews indicate that the current evidence level is low related to the effectiveness of nurse-led pre-operative care assessment (Hines et al., 2015). Some studies used a high level of standardised clinical care planning interventions that failed to achieve high efficiency and minimise OTDSCs (Hovlid et al., 2012; Gaucher et al., 2016). Standardisation of care using pre-assessment care protocols, tool kits, checklists and pre-operative assessments is a practical solution to minimise variation and different types of OTDSCs (McKendrick et al., 2014). Some studies have focused on implementing several standardisation approaches from the start to the end of the patient journey, such as standard care pathways and various pre-assessment care protocols, tool kits and checklists to minimise OTDSCs (Seme et al., 2010; Turunen et al., 2018).

However, finding a standard patient undergoing surgery in real care settings is hard and might be impossible (Samarasinghe et al., 2024). The main themes in individualised care literature have included recognising patients' individual clinical conditions, personal life situations and decisional control over care (Suhonen et al., 2018). Every patient is unique in their physiological, biological and psychological

individual needs (section 2.4.1). In modern care systems, standardised clinical care planning interventions are used to manage individualised clinical care needs (Lazzara et al., 2022; Rozich et al., 2004, Turunen et al., 2018). In practice each patient requires careful identification and individualisation of care needs, incorporating clinical and emotional preparation for undergoing surgery. Understanding and accommodating these individual needs using standardised clinical care planning is therefore crucial in providing effective and safe surgical care (section 2.4.1). However, how and why they work in real practice is rarely understood.

Failure to identify risks and addressing them in pre-operative care can lead to patient OTDSCs for clinical reasons. For example, a patient undergoing a low-risk surgical procedure might have several comorbidities such as anaemia, a history of smoking, depression and latex allergy. Failure to identify all these risks and understand the overall impact before surgery can lead to patients being cancelled by anaesthetists or surgeons because they believe that failure to manage risks can harm patients during or after the surgery. In addition to navigating various challenging working conditions, the PONs and other professionals must comply with standard clinical times, guidelines and performance targets. Several studies have indicated that individualisation of care concerning clinical care planning plays an important part in standardised clinical care planning interventions minimising OTDSCs (Schretlen et al., 2021b; Brazil et al., 2021) but have failed to understand how.

Most literature focuses on the benefits of standardising care using protocols, checklists and pre-assessment tools to minimise variation and improve care quality (Grocott et al., 2019; Massenburg et al., 2017). Protocol-based care (e.g., protocols, checklists and pre-assessment tools) is widely used in healthcare systems, and the inner workings of this can be complex and create various intended and unintended consequences (Rycroft-Malone et al., 2004). Although standardised clinical care planning interventions are widely used, some argue that the one-fit-for-all approach can create challenges for some patients undergoing surgery and lead to OTDSCs (Vaughn et al., 2017). For example, various social and economic contexts can create

complications that can lead to patients not attending surgery (i.e., OTDSCs initiated by patients). Many authors have argued the importance of embracing social and organisational complexities and understanding standardisation and individualisation of care in clinical contexts. In line with many arguments made by other scholars (Kvæl et al., 2022; Rostgaard, 2012a; Mannion and Exworthy, 2017), this perspective encourages critical thinking around the tension between standardisation and individualisation of care, particularly in the context of patient diversity and individual needs.

This thesis explores the nature of the tension between standardisation and individualisation of care in different types of standardised interventions (clinical care planning, communication, scheduling) and with different aspects of individualisation of care in phase two as part of IPTs (section 4.9). Various IPTs are developed based on different standardised interventions impacting different types of OTDSCs (table 4.8.2). For example, IPT 1 related to OTDSCs resulting from patients unfit for surgery linked to standardised clinical care planning interventions (i.e., checklists, clinical protocols, pre-assessment tools). IPT 2 relates to OTDSCs because of DNA or refusal to undergo surgery linked to standardised communication interventions (i.e., pre-interview protocols, texts, communication checklists and follow-up calls).

This thesis prioritises IPT 1, considering different types of evidence and critically investigating the tension between the standardisation and individualisation of care in standardised clinical care planning interventions. The thesis explores the nature of the tension between standardisation and individualisation concerning OTDSCs by investigating standardised clinical care planning interventions. This research study conceptualises that actors (e.g., anaesthetists, PONs, surgeons and administrators) and contexts (i.e., micro, meso and macro) can be influenced by the inner workings of standardised interventions. Consequently, this leads to tension between standardisation and individualisation of care when preparing patients for surgery (refer to section 3.2), which might result in unintended outcomes such as OTDSCs. As part of the prioritised IPT 1, the thesis discusses how various favourable (section 6.3) and unfavourable organisational contexts (section 5.7and 6.2) influence the

behaviours of PONs who complete standardised clinical care planning interventions, appearing to create tension between standardisation and individualisation of care.

2.4 Clinical autonomy, self-efficacy, compassion and situational awareness

Modern HDSs have become more complex: in addition to implementing standardisation of care, HDSs operate in a highly regulated environment where the patient population is ageing and new technologies and public scrutiny drive care delivery. In this context, the interactions of standardisation and individualisation of care to minimise unintended outcomes are far from linear, and often context-dependent. This section explains several concepts identified during the empirical exploration of the thesis. Most of these are widely discussed within several disciplines, including healthcare. The section below does not, therefore, aim to cover all the arguments related to these concepts but provides an overview of four key concepts: clinical autonomy, compassion, situational awareness, and self-efficacy.

2.4.1 Clinical autonomy

Autonomy refers to a professional's right to choose how to execute treatments and procedures (Freidson, 2001). The autonomy of healthcare professionals (individually and collectively) has long been under scrutiny (Exworthy et al., 2019; Pursio et al., 2021; Harrison and Ahmad, 2000). This thesis extensively discusses clinical autonomy among Pre-Operative Nurses (PONs). It is, therefore appropriate to define clinical autonomy related to nurses as *"the freedom to act based on what you know in the best interests of the patient…to make independent clinical decisions in the nursing sphere of practice and inter-dependent decisions in those spheres where nursing overlaps with other disciplines"* (Kramer et al., 2006, p. 480).

Going further, Kramer et al. (2006) identified three dimensions of autonomy in clinical practice settings. Dimension 1 is clinical/practice autonomy, which refers to nurses' inter-dependent, independent and accountable decision-making for the primary and immediate benefit of the patient. Dimension 2 is control over nursing practice autonomy/organisational autonomy, which relates to the regulation and development

of policies for nursing by nurses. Dimension 3 is job/work autonomy, which describes unit-level group decision-making to organise the work day and set priorities among tasks.

Many scholars in multiple fields, including science, healthcare and accounting, argue that front-line professionals resist standardisation (Mcdonald et al., 2006; Wilhelm et al., 2019; Freidson, 2001). For example, scholars argue that “professional logic” is increasingly oppressed by “managerial logic” influenced by organisational needs – consequently, professional autonomy is weakened in the name of efficiency and competition (Freidson, 2001; Wilhelm et al., 2019). Others argue that new public management approaches turned professionals into “occupational professionals” held accountable to their self-developed “bureaucratic” standards (Exworthy and Halford, 1998; Thomas and Hewitt, 2011). On the other hand, there are claims that standardisation is not so much challenging to professional autonomy – on the contrary, it may generate alternative possibilities and behaviours that might further strengthen the position of professionals and their autonomy (Ferlie et al., 2005; Borkowski and Allen, 2003; Thomas and Hewitt, 2011).

2.4.2 Compassion

Compassion occupies a prominent role in the creation and nourishment of the human community, including contemporary health systems. The link between high quality of care and compassion is often taken for granted in literature on contemporary healthcare systems (West, 2021). Many argue that compassion brings HCPs closer to the “whole” patient rather than just illness (Amutio-Kareaga et al., 2017). Compassionate care has many dimensions: ethical, professional, effective communication, human, spiritual/religious and getting involved with patients (Tehranineshat et al., 2019). Facilitating and inhibiting factors in delivering compassionate care vary based on various micro- (i.e., nurse characteristics, patients’ behaviours), meso- (i.e., workloads, role models, supportive communication among colleagues) and macro- (i.e., value of compassionate care in healthcare systems) factors (Tehranineshat et al., 2019).

Studies indicate that caring actions (compassionate actions) directed towards patient-centred or person-centred care are vital (Poirier and Sossong, 2010; Babaei et al., 2016; Arakelian et al., 2017; Tehranineshat et al., 2019; Mako et al., 2016). Delivery of expected high-quality care (i.e., safe care) consisted of noticing and acknowledging suffering is an important part of safe care or achieving desired outcomes (Mako et al., 2016).

The nurse's ability to identify and acknowledge a person's needs (customs, beliefs, values, cultural issues) and respond compassionately helps to improve patient-centred care and the quality of care (Babaei et al., 2016). Compassion manifests itself differently in different contexts and means different things to different people. It is often conflated with other ideas such as "empathy", "kindness", "caring" and "sympathy" (Schantz, 2007; Fotaki, 2015). Consequently, studies use different terms, including "caring actions" (Arakelian et al., 2017), "caring attitude" (Mako et al., 2016), "caring mindset" and "caring behaviours" (Poirier and Sossong, 2010; Babaei et al., 2016), which come very close to the idea of the (Kanov et al., 2004) definition of "compassion" in organisations. The thesis accommodates the following definition from Kanov at al. (2004) that compassion is a process comprising three interrelated elements: *"noticing" another's suffering… "feeling" the other's pain … "responding" to that person's suffering* (p. 812). Healthcare actors notice patients' suffering, feel or understand the impact on the patient and act towards minimising the suffering of patients and families.

Babaei et al. (2016) also identified compassion as three sub-processes: "*empathy with others", "love expression in the form of non-verbal emotional behaviours" and "emotional support of others by attendance at their risk"* (p. 319). Babaei and et al.'s (2016) three sub-processes have similarities to the definition from Kanov et al. (2004).

2.4.3 Situational awareness

Situational awareness is used in high-risk industries (e.g., offshore drilling and commercial aviation) to improve decision-making and quality and safety or minimise unintended outcomes (Wiegmann and Shappell, 2001; Sneddon et al., 2006). Based on different theoretical lenses, several theoretical models have been used to understand how situational awareness can minimise unintended outcomes(Hunter et al., 2020) . Situational awareness can be defined as “the perception of the elements in the environment in a volume of time and space, the comprehension of their meaning and the projection of their status in the near future” (Endsley, 1995, p. 36). The widely used model by Endsley(1995) for situational awareness consists of three levels: Level 1 – perception of the current situation and elements in the system (gathering data); Level 2 – comprehension of the current situation (interpreting information); and Level 3 – capability to project what can happen in the future state (anticipation of future).

Situational awareness is taken as a key component of decision-making to minimise unintended outcomes and improve patient safety and clinical performance in many healthcare settings: paramedicine (Hunter et al., 2020), critical care (Schulz et al., 2015) and Operating Theatres (OTs) (Brennan et al., 2020; Flin et al., 2007). In surgical care settings, these three levels identified in the Endsley’s model are influenced by various macro- (i.e., perceptions of decision-makers and skills) and meso- (i.e., inter- and intra-professional collaboration, complexity of the situation, workload)factors (Stubbings et al., 2012). The use of “tunnel vision” because of “task in hand” approaches is identified as an example of limited awareness that can be detrimental to minimising unintended outcomes or safety (Brennan et al., 2020). The standardised approach (i.e., using a tool with criteria) that carefully considers individual needs and expectations has helped to improve handover decisions (Shahid and Thomas, 2018).

2.4.4 Self-efficacy

Self-efficacy, a concept proposed in the seminal work of psychologist Albert Bandura (1977), implies an individual’s belief in their ability to fulfil behaviours necessary to

produce specific performance outcomes. Self-efficacy is a vital mechanism in human agency and improves competencies (Bandura, 1982; Falk-Brynhildsen et al., 2019). In short, it can be explained as confidence in one's capacity to influence events and control one's environment (Bandura, 1977). The concept of self-efficacy is constructed from three principal information sources: active mastery experiences that serve as capability indicators, vicarious experiences that alter efficacy beliefs compared to attaining other role models, and verbal persuasion (Bandura, 1977).

Individual high levels of self-efficacy have been linked with various benefits, such as healthy lifestyle habits, resilience to adversity and improved performance of employees and students (Moran et al., 2018; Falk-Brynhildsen et al., 2019; Lee et al., 2008). Some argue that standardisation of care has limitations in improving safety in healthcare (i.e., minimising unintended outcomes), and self-efficacy has a role as a substitute-for-standardisation to promote the behaviours of HCPs and influence patient safety (Katz-Navon et al., 2007).

2.5 Research setting

This section explains the research setting in which the research was conducted, which includes how the various policies influenced SSCSs in the NHS and an overview of OTDSCs.

2.5.1 Schedule Surgical Care System overview

Surgery is a foundational building block of HDSs all over the world. Surgical care is critical for global cancer care in all care settings. It is estimated that, every year, around 234 million major surgeries are completed globally (Weiser et al., 2008a). Around 15 million new cases of cancer emerged in 2015, and over 80% of cases will need surgery, sometimes more than once (Sullivan et al., 2015).

Surgical care is an invasive and high-risk procedure, usually requiring a local or general anaesthetic. The review defines surgery as an invasive medical procedure

performed in an Operating Theatre (OT). All surgeries can be divided into two main umbrella categories: scheduled (sometimes called elective or planned) and emergency, or urgent. Emergency, or urgent, and semi-emergency surgery are outside the scope of this study. Instead, the study focuses on scheduled and planned surgery, sometimes called elective surgery. This study focused on SSCSs, which deliver scheduled surgical care in three closely linked stages: pre-operative care, intra-operative care and post-surgical care.

All age groups can elect to schedule surgery, and many patient groups do so, including high-risk groups such as cancer, palliative care and cardiology patients. Although different models of delivering surgical care exist worldwide, the journeys of most scheduled care patients begin with a referral from primary care, and most patients who undergo scheduled surgical care are admitted to hospitals from home. Although there are substantive variations in individual patient journeys (sometimes known as care pathways) and experiences, depending on local healthcare systems and hospital infrastructure or surgical procedures, it is useful to consider a hypothetical journey most patients can anticipate undergoing as part of the scheduled surgical care patient journey. Usually, once a patient has reached a decision to undergo surgery, the multi-disciplinary clinical team, consisting of PONs, anaesthetists and surgeons, makes pre-operative care arrangements (i.e., prepares patients for surgery). Based on the facilities available, most scheduled care patients undergo a pre-operative clinical assessment, which focuses on identifying and modifying existing risk factors where possible to avoid risks to patients throughout the surgical care journey, including during (intra-operative) and after (post-operative)surgery (Bougeard et al., 2017; Grocott et al., 2019). The pre-operative assessment is given various names (e.g., pre-assessment, care protocol), and the scope varies depending on the healthcare system. However, on most occasions, the aim is to identify patients' clinical and communication needs and allocate resources based on these needs to undergo surgery.

As a result of the high risks involved in surgery, managing clinical risks is vital in SSCSs. From a clinical perspective, during pre-operative care, patients' clinical risks

and allergies are identified and managed based on prevailing clinical conditions. Furthermore, medications or lifestyle modifications may be suggested, such as weight loss, stopping certain medications, management of anaemia or smoking cessation. Where necessary, the patient is referred to other clinical specialists within the organisation or outside (e.g., social care workers, physiotherapists). Usually, as part of pre-operative care, instructions and information are given to patients undergoing surgery well in advance or before the patient is admitted to surgery. Each patient undergoing planned surgery brings a diverse set of needs, including socio-economic status, the biology of their disease, and existing physical and mental conditions. These need to be addressed as part of care planning and delivery (Leino-Kilpi and Rannikko, 2019).

As a consequence of the invasive procedures involved and use of anaesthesia, SSCSs are very high-risk clinical systems. To meet individualised patient care needs and substantive clinical risks, healthcare workers (e.g., anaesthetists, surgeons and nurses) need to plan and organise clinical and non-clinical elements of surgery, which tends to create a high number of interactions between healthcare professionals from multiple clinical disciplines working with support services such as sterile services, waiting list administrators and patient support services (e.g., patient transportation, translation services). As a result, SSCSs are known to demonstrate high levels of variability on account of specialisms, processes, delays, resource limitations and patients' diverse medical conditions (Van Riet and Demeulemeester, 2015), leading to increased uncertainty, variability and complexity in the system.

Most patients undergoing surgery require General Anaesthesia (GA) or Local Anaesthesia (LA). Under GA, medicines are used to send patients to "sleep", so the patient is unaware of the surgical procedure and does not move or feel pain while the surgical procedure is carried out (Hussain et al., 2014). As a result of the high clinical risks related to surgical care and GA, patients feel very vulnerable when undergoing surgery and some patients find going through surgery a very anxious process (Fodale et al., 2017). GA and other clinical risks mean that each patients

requiring a high level of individualisation of care to minimise harm and surgical complications (Leino-Kilpi and Rannikko, 2019).

Patients admitted to hospital on the day of surgery undergo relatively basic initial assessments by nursing staff. After admission, most of the anaesthetists involved, accompanied by the surgeon, review the patient's clinical suitability for surgery. Based on a favourable decision to continue with surgery from the clinical team (i.e., anaesthetist and surgeon), the patient undergoes surgery, based on an individually tailored treatment plan consisting of specific surgical and anaesthetic techniques. Depending on the type of surgery the patient's clinical condition (such as volume of blood lost, co-morbidities) and the complexity of the procedure, the time taken in the OT can significantly vary (Van Huele and Vanhoucke, 2015).

After the procedure is completed, the patient undergoes the first phase of post-operative recovery in a hospital. In the majority of surgical cases, low-risk patients undergoing uncomplicated procedures tend to be discharged from hospital on the same day as their surgery (day-case), while the remaining cases have inpatient surgery, where patients stay in hospital for a minimum of one night after their procedure(Abbott et al., 2017). Some patients undergo specific types of post-recovery based on their clinical needs in critical care specialist wards (Bougeard et al., 2017; Grocott et al., 2019).

2.5.2 Summary of the policy landscape

All systems, including SSCSs, are continuously influenced by numerous variables, including historical, local, national and international contexts (Shaw et al., 2018; Greenhalgh et al., 2017). This section summarises the policies that influence SSCSs in general.

Extraordinary gains have been made in global health in the past two to three decades, especially in surgery, but progress has not been uniform. Most development is enjoyed by high-income countries, while the need for surgical care in the world's poorest countries is rarely acknowledged and mostly unrecognised. It is

estimated that, in 2010, 16.9 million conditions needed surgical care, accounting for 32.9% of deaths worldwide (Brugha et al., 2015; Meara et al., 2015). Every human life is precious, so it is worth acknowledging the potential of surgery and its limitations in the current environment. However, as in many areas, most surgery-related literature is dominated by high-income countries (Bickler and Spiegel, 2008; Brugha et al., 2015). The empirical investigation of the thesis is completed in a high-income country, and this section therefore provides an overview of the policy landscape of SSCSs in high-income countries.

Delivering scheduled surgical care is expensive and accounts for many hospital costs (Fong et al., 2016; Childers and Maggard-Gibbons, 2018). Surgical care in general is expensive and international costs vary significantly (Christou et al., 2022a). For example, in the United States in 2010, approximately $175 billion was spent on surgical care (Zygourakis et al., 2017) but the published costs of OT vary from as low as $7 to as high as $113 per minute (Christou et al., 2022). Despite the high costs, demand for surgical care has been increasing rapidly in most countries for decades, including in the UK (Chalkley et al., 2017).

Over the last two decades, various technological innovations related to surgical procedures (e.g., robotics, stem cell and various implants), patient-facing activities and training have demonstrated the potential to improve quality (Kerr, 2020). In some areas, robotic assisted surgery and artificial intelligence demonstrates a potential to improve patient outcomes. However, to improve patient outcomes, such technology is dependent on teamwork and many other conditions (Hashimoto et al., 2018; Randell et al., 2019). Furthermore, the patient population is ageing, and public expectations of treatment outcomes are also increasing(Levy et al., 2021). Most countries also struggle with widespread issues such as paucity of investment in public surgical care, low investment in research, recruitment shortages for HCPs and training and education gaps (Sullivan et al., 2015; Kerr, 2020).

The length and duration of queues for surgical care are referred to as waiting lists and wait times, respectively. One of the most notable trends in surgery is increasing waiting times for publicly funded scheduled surgery, which has been a major health policy concern, putting enormous pressure on managers and clinicians in most developed countries(Siciliani and Hurst, 2005; Viberg et al., 2013). Increasing waiting times indicate the ever-problematic imbalance between the demand for and supply of limited surgical resources, a common problem in SSCSs in many high-income countries. The impact of the COVID-19 pandemic has further exacerbated the global waiting list challenge, leading to enormous scheduled surgical care lists and creating much suffering and pain for patients and their families (Dickerson et al., 2011; Lofvendahl, 2005; Guo et al., 2022).

In the last two decades, technological innovations have improved patient-reported outcomes related to various surgical procedures. However, increasing international attention from policymakers has been directed toward minimising unintended outcomes while improving the quality and safety of surgical care (Jagger et al., 2008). An estimated 234.2 million major surgical procedures are undertaken each year worldwide, of which almost seven million patients experience major surgical complications, and one million die during or immediately after surgery (Weiser et al., 2008b). Around 50% of these adverse events are deemed preventable (Weiser et al., 2008). This means that, when patients undergo surgery, anticipating intended outcomes are high. Surgical care-related infections account for 14% to 17% of all hospital infections (Weigelt et al., 2010; Spagnolo et al., 2013). Delivering safe and efficient surgery has become a significant global health issue (Howell et al., 2014). Surgery cancellation is one of the biggest long-standing unintended outcomes, significantly negatively impacting patients and healthcare organisations worldwide, but little is known about its causes (Gillen et al., 2009; Abate et al., 2020). A significant barrier to delivering effective and safe surgical care worldwide is a lack of a deeper understanding of system factors leading to delivery of safer and more efficient surgical care (Meara et al., 2015; Rose et al., 2015).

SSCSs are defined globally by various socio-economic needs. On the one hand, demand for surgical care is increasing in high-income countries, and managing waiting lists is a priority. Despite the benefits, SSCSs reported many unintended outcomes that bring further suffering to patients and waste valuable healthcare resources (Howell et al., 2014). In addition, the ageing population has high expectations of treatment outcomes. Healthcare systems, including those involved in SSCSs, are under substantial pressure to meet high demand and deliver high quality while maintaining low costs (Christou et al., 2022b; Paterson-Brown, 2018). To manage these challenging and interconnected dynamics, SSCSs have moved towards increasing standardisation of care in the last few decades (Weiser et al., 2009; Lazzara et al., 2022; Johnson et al., 2018).

2.5.3 The promise of standardisation of care

Inspired by various industries, there is an expectation that standardisation of care minimises cost and unintended outcomes and improves quality and patient safety outcomes(Cook et al., 2014). In recent years, different groups have therefore implemented different types of standardisations of care, specifically aimed at preventing unintended outcomes and improving services in surgical care (Weiser et al., 2009; Skjold-Ødegaard and Søreide, 2020).

For example, the World Health Organisation (WHO) launched its “Safe Surgery Saves Lives” campaign by introducing procedural standards (i.e., a sub-type of standardisation of care) where the main aim was to improve the patient safety of surgical care around the globe by improving adherence to safety practices (Seme et al., 2010). One of the main outcomes of the WHO programme was the Surgical Safety Checklist (SSC). This checklist consists of a series of checks that have to be performed at the start and end of a surgical procedure: for example, immediately before the delivery of anaesthesia, before any incision, and after completion of the surgical procedure before the patient leaves the OT (Seme et al., 2010).

Standardisation of care using a checklist creates substantive benefits, improves safety outcomes, enhances communication among HCPs working in the OT, and achieves cost savings (Seme et al., 2010; Weiser and Haynes, 2018). A best-selling book (*The Checklist Manifesto*) by renowned surgeon Atul Gawande even proclaimed checklists to be “the biggest clinical invention in thirty years” (Gawande, 2010). The WHO checklist is implemented all around the globe(Weiser and Haynes, 2018; Seme et al., 2010; Delisle et al., 2020). Similarly, various standard forms, protocols and clinical algorithms have been introduced and some studies report consequent improvement in patient outcomes and reduction of unintended outcomes (Mannion and Braithwaite, 2012; Lazzara et al., 2022; Rycroft-Malone et al., 2009; Turunen et al., 2018).

The predictable nature of patient admissions has made it easier to standardise SSCSs, and many attempts have been made to standardise SSCSs using a “factory-like” system. The Mayo Clinic in the US is a well-documented success story whereby industrial engineering principles have converted the SSCS into “factory-like” standardisation to reduce cost and improve quality (Cook et al., 2014). Furthermore, inspired by the manufacturing industry, various improvement methods directly linked to the standardisation of care such as the Lean Six Sigma have been introduced to minimise unintended outcomes and improve the quality of care (Morton and Cornwell, 2009; Stone, 2012; Costa and Godinho Filho, 2016). Various performance targets have been introduced to improve team and organisational processes and outcomes. Some argue that standardisation of care is the mechanism to improve care (Lazzara et al., 2022; Rozich et al., 2004). The next section provides an overview of the SSCS in the NHS and discusses how various types of standardisation are used to deliver care.

2.5.4 Scheduled Surgical Care System in the NHS

In the UK NHS, approximately 1.5 million major surgical procedures are carried out annually at a cost of around £5 billion(Abbott et al., 2017).Most scheduled surgical care is delivered by the government-funded NHS. For decades, minimising, managing and maintaining surgical care waiting lists has been a significant challenge

in the NHS. Traditionally, most patients requiring surgery are referred to secondary care organisations by their GPs. Surgical care tends to be performed in community, district and university hospitals. In the English NHS, SSCSs share key resources, including OTs, post-operative beds and HCPs, with Accident and Emergency (A&E) services and other hospital functions increasing variability and uncertainty in the system. Increasing numbers of emergency admissions and discharge delays alongside a decade of austerity measures have created significant operational problems in English hospitals (Gaughan et al., 2017; Keogh et al., 2018). Over the last ten years, the SSCS in England has faced immense pressure to improve surgical care at a time of growing demand, and financial pressures have also created high levels of stress and other work-related well-being issues among the NHS healthcare workforce (Heinen et al., 2013; Ham et al., 2016; Khan et al., 2018).

As in many high-income countries, complications after surgery appear to be more common in England, affecting around one in ten patients after inpatient surgery in the NHS (Fowler et al., 2023). Various other unintended outcomes, such as medication errors, infections acquired during surgery, surgery cancellations and delayed discharges, also arise (Wong et al., 2019; Rojas-García et al., 2018; Brattheim et al., 2011). However, the severity and prevalence of complications vary depending on the type of surgery and data reported (Wong et al., 2019; Castelli et al., 2015; McCulloch et al., 2013).

Also as in many other countries, over the last few years, SSCSs in England have gone through various aspects of standardisation of care (standardised interventions, checklists, care processes, EBM, performance targets, budgets, terminology) and practices, creating tension at various levels of the system. SSCSs in the English NHS are designed using process improvement approaches, where patients undergoing surgery go through a standardised patient care process or care pathway (Grocott et al., 2017; Martin et al., 2017; Schrijvers et al., 2012b).

Most patients undergoing surgery are referred by GPs and other professionals in primary care using standardised electronic referrals, forms and a series of standardised protocols. Patient triage systems are used to manage referral care and care in the initial stages. When the clinical team decides to use surgery as a treatment option, the necessary preparations for surgery are completed using a series of standardised interventions. Patient and resource allocation required for surgery is completed with a series of standardised interventions covering various aspects of communication, clinical care planning and resource allocation (Brazil et al., 2021; Dimitriadis et al., 2013; Pulido et al., 2014; Sobanko et al., 2017; Haufler and Harrington, 2011). For example, various clinical care planning interventions are used to prepare patients for surgery using protocols, pre-assessment care plans and pre-operative assessments (Ellis et al., 2012; Brazil et al., 2021). Patient communication is carried out using standardised interview protocols, letter templates, forms and information leaflets (McCartney, 2013; Nicolson, 2013). When surgery is scheduled, patients are reminded to attend using standardised text messages or letters. Similarly, general care planning and other organisational support services and resource allocations are completed using protocol-based care (Rycroft-Malone et al., 2004).

A wide variety of performance standards are used to monitor various clinical (e.g. clinical outcomes, adverse events) and management (e.g. patient satisfaction, waiting time, bed occupancy) aspects of SSCS performance (Breyer et al., 2019). In the English NHS, a very strong regime of national performance indicators consisting of waiting times is used to monitor SSCSs in organisations (Pollitt, 2018; Elkomy and Cookson, 2020). In addition, various other patient outcome related indicators such as 30 or 100-day mortality are used to measure organisational performance (Exworthy et al., 2019; Thorlby et al., 2019). Further, various standardised terminology, patient-reported outcomes and codes are used to monitor and sometimes pay for treatments (McIntyre and Chow, 2020; McIntosh et al., 2012; Thorlby et al., 2019).

Despite a high level of standardisation, until recently, most critical physical (including post-operative beds, theatre and recovery space) and personal resources tend to be

shared among these specialities and emergency care patients. In addition, most NHS scheduled care shares vital human and physical resources with several clinical specialists (e.g., general surgery, cardiology, ear, nose and throat, orthopaedic and vascular). Consequently, scheduled care resources are used for emergency care patients. Sometimes, HCPs (PONs, surgical care nurses, anaesthetists, surgeons) must care for patients admitted as emergencies, which can lead to interruptions in scheduled care and create stress and higher workloads among scheduled care HCPs. Sometimes, patients admitted as emergencies are given clinical priority, meaning that hospitals tend to cancel scheduled care surgeries (Van Riet and Demeulemeester, 2015; Jarvis, 2016; Viccellio, 2001; Hoot and Aronsky, 2008).

Recently, surgical hubs were introduced as part of NHS England's COVID-19 recovery plan to improve capacity and surgical flow and give patients faster access to elective care, particularly for common procedures (Briggs et al., 2022). Surgical hubs are protected facilities dedicated entirely to elective care, with ring-fenced resources that allow them to stay active even when emergencies arise (Briggs et al., 2022). However, many hospitals in the NHS still share various resources such as post-operative beds, theatre and recovery space with other A&E services (Etheridge, 2023; Briggs et al., 2022; Limb, 2023). The surgical care hubs have helped to streamline care by using "factory-like" systems and various aspects of standardisation of care (Limb, 2023; Briggs et al., 2022).

Despite the high standardisation agenda, patient population complications arise because of an ageing population with an increasing prevalence of multi-morbidity and frailty. Furthermore, patient populations consist of different socio-economic backgrounds. There is notable evidence that patients from ethnic minorities and deprived social and economic backgrounds have reported worse clinical outcomes post-surgery (Cookson et al., 2012; Al Talalwah and McIltrot, 2019; Schoenfeld et al., 2014). In addition, there are now greater public expectations of healthcare providers. Unfortunately, often, these expectations can be difficult to manage(Levy et al., 2021). The clinical interface highlights that addressing patients' individual clinical and socio-economic needs as part of the care delivery is an important part of care (Priebe,

2011), which can minimise unintended outcomes such as surgery cancellations and delayed discharges (Ulin et al., 2016; Hovlid et al., 2012).

The NHS faces a monumental challenge to reduce current waiting lists, which have mounted because of the pandemic. Data from NHS England shows that, as of October 2023, around 7.75 million patients were waiting for treatments in England alone (Mahase, 2023). The UK's prime minister pledged to reduce NHS waiting times as one of five priorities. However, while the NHS has made some progress in reducing the waiting list backlog, it is unlikely to see a meaningful drop in waiting times before the middle of 2024 (Mahase, 2023). The years of austerity measures in the NHS have meant that key sectors such as social care, emergency care and general practice, as well as social care crises, also need urgent attention and money (Pope, 2023; Kerasidou, 2019; Powell, 2019). Some argue that the current government has failed to grasp the extent of these problems or the likely consequences for patients. Government rhetoric has indicated a lack of both political drive and the investment required for meaningful action (Pope, 2023).

In summary, as in many countries, the SSCS in the NHS is driven by various socio-economic factors and has been under significant pressure from multiple stakeholders. As with many other SSCSs, the NHS relies on standardisation of care to minimise waiting lists and undesired outcomes while maintaining cost-effective care, which is a big task. One of the widely reported unintended outcomes in NHS and globally is OTDSCs. The next section explores these.

2.6 Unintended outcome under investigation: On the day surgery cancellations

2.6.1 Overview

One of the main unintended outcomes of SSCSs is the inability of patients to undergo surgery on the scheduled day of the surgery (resulting in OTDSCs). This is a long-standing global problem. In contrast, the intended outcome is that the patient is able to undergo surgery.

When a scheduled surgery is cancelled on the day of admission or the day of surgery, it is defined as an OTDSC. This evidence review focused on surgery cancellations that occur on the day of surgery, as the impact can be significantly high for all the stakeholders: patients, carers and healthcare providers (Gibney, 2018). For example, OTDSCs substantially negatively impact patients and organisations (Viftrup et al., 2020). On most occasions, the patient has arrived at hospital anticipating the surgery, creating significant inconvenience and suffering for patients and carers. Similarly, most healthcare providers also allocate personnel and physical resources, which may not always be feasible to use again. Furthermore, the healthcare provider must schedule the patient's surgery again, resulting in additional administration costs (Dimitriadis et al., 2013).

On most occasions, on the same day, patients admitted to hospital undergo surgery. There can be rare occasions when patients are admitted in advance a day before to undergo surgery on the next day as a preparation. It is important to note that surgery cancellation after a patient is added to the surgical care waiting list or after a decision to have surgery results from patient and organisational reasons. Surgery cancellations outside of on the day of surgery (i.e., before the day of admission or surgery), usually have a minimal impact on the patient or organisation. Sometimes, surgery cancellations happen before admission or surgery, which is an important process of managing waiting lists and logistics within the SSCSs. For example, a clinical team might postpone a specific patient's surgery due to clinical risks or unavailability of resources. Cancellations of emergency, or urgent, and semi-emergency surgery fall outside the scope of this study.

Patients undergoing surgery often feel anxious and vulnerable, and cancellation on the day of surgery can increase emotional suffering and cause inconvenience to patients and carers (Viftrup et al., 2020). OTDSCs create high levels of waste and significantly negatively impact OTs and hospital efficiencies (Seim et al., 2009; Keller et al., 2014). In addition to leading to patient suffering, OTDSCs arguably create patient safety issues. However, the evidence is very limited (Al Talalwah and McIltrot,

2019; Caesar et al., 2014). Some studies have highlighted the negative impact of OTDSCs on HCPs and other healthcare workers (Viftrup et al., 2020; Dimitriadis et al., 2013).

2.6.2 Significant financial and economic problems

OTDSCs create high levels of waste and significantly negatively impact OTs and hospital efficiencies (Seim et al., 2009; Keller et al., 2014). A US study completed in the veterans health administrative system found 12.4% surgery Cancellation Rates (CRs), leading to a $32 million estimated loss of income (Argo et al., 2009). McIntosh et al. (2012) recorded that, in 2007 alone, acute care trusts claimed £70 million as part of the cost of OTDSCs in the English NHS. As a result of the methodological limitations in the calculation, this £70 million sum could be an underestimation. In the UK, approximately one third of an acute hospital's costs is attributed to OTs, and the average cost of running one OT in the UK is £9,600 per day(Halim et al., 2018). The published costs of OTs differ from as low as $7 and as high as $113 per minute (Christou et al., 2022),providing a good indication of the significant cost implications, including lost revenue, related to OTDSCs. The cost of lost OT time because of surgery cancellation is as high as £400 million per year in English NHS (Gilles et al., 2018). When OTDSCs happen, the resources allocated can be wasted, which include theatre equipment (i.e. kit) and allocated professionals' (e.g., anaesthetists and surgeons) time. Despite systematic searches in numerous literature databases, no economic impact or cost analysis studies were identified with relevance to OTDSCs.

2.6.3 A long-standing global problem

The meta-analysis suggest that the global prevalence of surgery case cancellation on the intended day of surgery can be as high as 18% (Abate et al., 2020). In the NHS in the UK, around 10% of patients reported previous surgery cancellations for the same procedure, and coincident hospital data indicated that 13.9% of patients attending inpatient surgery were cancelled on the day (Wong et al., 2018).

OTDSC prevalence exceeding 10% of all scheduled cases has been reported in hospitals in the US (Argo et al., 2009; Lacqua et al., 1994), Europe (Sanjay et al., 2007; Seim et al., 2009), Africa (Prin et al., 2017) and Asia (Pang et al., 2019; Chiu et al., 2012). Published multi-centre studies identified considerable variation in OTDSC CRs in healthcare providers (Argo et al., 2009; Schuster et al., 2011a; McIntosh et al., 2012; Wong et al., 2018).

Most countries reported surgery cancellations and most reported studies are from Europe and North America (Abate et al., 2020; Seim et al., 2009; Al Talalwah and McIltrot, 2019). The prevalence of OTDSCs varies significantly even within the same healthcare system, which suggests OTDSCs are a multi-factorial and context-sensitive phenomenon (Barbeiro, 2010; Leslie et al., 2013).

2.6.4 Reasons for OTDSCs

Studies have reported a wide variety of reasons for OTDSCs: patients unwell for surgery, unavailability of post-operative beds and equipment, professionals, inadequate theatre time to complete surgery, and patients who DNA or refuse to provide consent to undergo surgery (Chalya et al., 2011; Al Talalwah and McIltrot, 2019). A range of studies have described a wide variety of reasons and categorisations for OTDSCs consisting of many different causal pathways (Chalya et al., 2011; Leslie et al., 2013), which makes it challenging to synthesise theories and develop evidence-informed interventions. For example, a German study(Schuster et al., 2011) identifies 23 reasons for cancellation. Another study(Argo et al., 2009) identifies 26 reasons for cancellations. The studies used different definitions for surgery cancellations and substantive variations in categorisation and reasons. Furthermore, the definitions of the reported reasons were not clear. It is therefore not easy to understand which reasons are most prevalent.

One of the most widely reported reasons for surgery cancellation across the globe is patients unfit or clinically unsuitable for surgery (Wong et al., 2018; Argo et al., 2009; Schuster et al., 2011). Studies have reported high percentages of surgery

Cancellation Rates(CRs) resulting from patients unfit for surgery: 32.6% (Kaddoum et al. 2016), 80% (Dalton et al. 2016) and 50% (González-Arévalo et al., 2009). OTDSCs for clinical reasons because of patients unfit for surgery cover a wide range of reasons. For example, this category includes reasons such as patient medication not managed or stopped (e.g., anti-coagulant medication), patient co-morbidities not managed (e.g., anaemia, hypertension), patients' relevant tests not completed or available (e.g., blood tests, X-ray), and patient allergies (e.g., latex, antibiotic) not identified. The clinicians who reviewed patients' clinical readiness to initiate OTDSCs for clinical reasons believed that proceeding with the surgery could lead to clinical risks during or after surgery.

DNA is one of the most widely reported reasons for surgery cancellations (Dimitriadis et al., 2013; Chalya et al., 2011; Laisi et al., 2013; Kaddoum et al., 2016). Several studies reported high percentages of surgery cancellations resulting from incidences of DNA: 40% (Cihoda et al., 2015) and 50% (González-Arévalo et al., 2009). The unavailability of various resources appears to initiate OTDSCs. Another widely reported reason for OTDSCs is the unavailability of theatre time to complete the surgery (Chiu et al., 2012; González-Arévalo et al., 2009; Kaddoum et al., 2016). OTDSCs because of post-operative bed unavailability are widely reported in many countries, including Ireland (Coyle et al., 2012), Sweden (Caesar et al., 2014), Lebanon (Kaddoum et al., 2016), the US (Argo et al., 2009; Seim et al., 2009) and the UK (Wong et al. 2018; Dimitriadis et al. 2013; O'Dwyer et al. 2015). Most studies report a small number of OTDSCs resulting from the unavailability of healthcare professionals: 7 of 261 (Kaddoum et al., 2016), 16 of 644 (Chalya et al., 2011) and 43 of 551 (Laisi et al., 2013). Unavailability of surgeons, anaesthetists and occasionally nurses has been widely reported as a reason for OTDSCs (Dimitriadis et al. 2013; Kaddoum et al. 2016; Schuster et al. 2011; Laisi et al. 2013). Various other reasons involving patients, such as insurance payment issues, unavailability of theatre instruments, and sterilisation of kits, resulted in OTDSCs (Gillen et al., 2009; Kaddoum et al., 2016; Seim et al., 2009).

Most studies are descriptive studies that focus on prevalence and suggest that OTDSCs are a long-standing global problem. OTDSC is a multi-factorial unwanted outcome in which causal factors can be hidden behind human agency and structure. Despite high On The Day Surgery Cancellation Rates (OTDS CRs) reported around the world, several studies have reported that a high percentage of OTDSCs is avoidable: 80% (Rymaruk, 2011), 80% (Bamashmus et al., 2010) and 60% (Schofield et al., 2005). Evidence suggests that most surgery cancellations are preventable (Schofield et al., 2005; Trentman et al., 2010), and very low CRs (i.e. lower than 2%) are achievable (Sung et al., 2010; Smith et al., 2014). Despite the significant suffering and substantive waste of healthcare resources, very little is known about surgery cancellations and how to minimise them. Neither systematic reviews nor comprehensive studies or realist reviews on OTDSCs were found, meaning that existing atheoretical knowledge has significant limitations in facilitating understanding of the causes and contributors that influence or minimise OTDSCs in HDSs.

2.7 Conclusion

This chapter sets the scene for the thesis, explaining the overall theory for the research investigation and the research setting in which the research is conducted. The chapter is structured in four main sections.

The first section explained that, despite the efforts of main stakeholders including policymakers, unintended outcomes in HDSs are a global problem, with most HDSs recording unintended outcomes, some more than others. Standardisation of care is arguably presented as one of the most important mechanisms, or even the universal solution, to minimise unintended outcomes and improve the quality of HDSs. Some argue that the importance of individualisation of care or similar concepts (patient-centred care or person-centred care) in HDSs is vital for care delivery as well as to minimise unintended outcomes or improve healthcare quality. Many scholars have highlighted the urgent need to understand the importance of the dynamics of standardisation and individualisation of care and how these have influenced unintended outcomes in modern HDSs (Ansmann and Pfaff, 2018; Kvæl et al.,

2022). The next section provided an overview of the summary of various concepts found in the empirical investigation: clinical autonomy, self-efficacy, situational awareness and compassion.

The third section focused on setting out the research and how various policies and many socio-economic factors, such as high demand, re-shape SSCSs in England. As in many other HDSs, standardisation of care is arguably a universal solution to manage these multiple dynamics in NHS and minimise unintended outcomes in SSCSs, including OTDSCs. The fourth section explained the main unintended outcome under investigation (OTDSCs), explaining the definitions and negative impact of OTDSCs and their multi-factorial nature. The next chapter is the methodological chapter and addresses the main methodological considerations encountered during this investigation.

3 Methodology Chapter

3.1 Introduction

This chapter addresses the main methodological considerations encountered during this study, including ethical considerations. It discusses the philosophical assumptions of the research, with particular attention to the realist methodology adopted. The chapter is divided into four sections. First, the chapter explains how the research investigation conceptualises the unintended outcomes (i.e., OTDSCs) and their system (SSCSs). Second, it presents an overview of ontology and epistemology and the rationale for choosing a realist methodology, including the main principles of a realist methodology. The third section explains the five-phase research process, including the data collection methods and how they were analysed. The final section discusses ethics and confidentiality.

3.2 Conceptualisation

Conceptualisation can provide tools to better illustrate, communicate, understand, explain and intervene in open systems such as HDSs (Exworthy, 2008).People are not passive recipients of interventions or social programmes – they need to participate or be influenced by them, leading to different intended and unintended outcomes (Manojlovich et al., 2016; Greenhalgh et al., 2004). It is widely acknowledged that no intervention is likely to be “simple” in a real care setting (Moore et al., 2015; Craig et al., 2008).

Most healthcare problems are considered to be complex problems, which are challenging to resolve (Crowley and Head, 2017). Glouberman and Zimmerman (2002) provide a useful conceptualisation to distinguish between types of problems: simple, complicated and complex. Once mastered, simple problems are easily repeated by following list of instructions (e.g., following a recipe) and much likely to achieve intended outcome. Complicated problems are those that may contain a relatively small set of simple problems but are not merely reduceable, and resolving them will also require specific knowledge and coordination. Given sufficient resources, expertise and commitment, simple and complicated problems can be

solved with a high level of certainty. Glouberman and Zimmerman (2002) argued that complex problems can comprehend both simple and complicated problems but are not reduceable because of interdependency, unique local situations or influences, and the ability to adapt to variations in conditions (the example given is “raising a child”). Complex problems are more challenging because of their unpredictable nature. Formulae from previous situations might have more partial application, and, although technical knowledge or expertise can contribute in valuable ways to the intended outcomes process, these provide neither necessary nor sufficient conditions to ensure intended or expected outcomes (Glouberman and Zimmerman, 2002).

OTDSCs are described as multi-factorial and context-sensitive unintended outcomes with several causal pathways hidden behind human agency and structure (section 2.5). Considering this, the thesis conceptualises OTDSCs as a complex problem. As highlighted, the study aims to understand how to minimise OTDSCs and minimise unintended outcomes in HDSs. The long-term aims of the study are to develop evidence-informed interventions to improve patient care, providing practical help to a wide variety of stakeholders, including leaders and policymakers. Rather than limiting the scope of the study to a few variables, this research, therefore, aims to embrace the system’s complexity.

The research study conceptualises that SSCSs deliver care using a series of different types of standardised interventions (i.e., clinical care planning, communication and scheduling) where each intervention is continuously influenced by various actors and contexts. The Medical Research Council (MRC) describes a complex intervention as one that is multi-faceted, with numerous interacting elements or components often requiring modification or adaptation, based on the contexts and actors delivering and receiving the intervention (Moore et al., 2015). This can lead to intended or unintended outcomes (Skivington et al., 2021; Craig et al., 2008). Understanding complex interventions requires clear conceptualisation of the contributing components and how they work collectively to produce various outcomes (Skivington et al., 2021; Craig et al., 2008).

The research investigates and conceptualises the interventions involved in preparing patients for scheduled care surgery such as standardised clinical care planning, communication and scheduling interventions (refer to section 4. 2.1 for more information about these interventions) as complex interventions. Contexts and actors influenced, these interventions continuously which can creates differential outcomes related to the preparation of surgery. Different types of standardised interventions are used to improve various aspects of preparation or readiness before patients are admitted to hospital to undergo surgery (pre-operative care). Whether or not the patient is ready for surgery and the extent of preparation of various aspects determines whether the patient can undergo surgery (i.e., OTDSCs when a decision to cancel is made on the day of the scheduled procedure).

This research study conceptualises that actors (e.g., anaesthetists, PONs, surgeons and administrators) and contexts (i.e., micro, meso and macro) can influenced on the inner workings of interventions used in preparing patients for surgery. When a specific type of intervention creates inadequate preparation or readiness for surgery in a specific aspect of care, it leads to unintended outcomes such as OTDSCs. In contrast, high and adequate levels of preparation or readiness for surgery in a specific aspect of care can minimise OTDSCs and result in decisions in favour of undergoing surgery. For example, standardised clinical care planning interventions such as pre-assessment tools, clinical care planning protocols and tools are used to prepare patients before surgery. Failures in the inner workings of standardised clinical care planning interventions because of actors or contexts can lead to inadequate preparation or readiness related to clinical care planning. This leads OTDSCs for clinical reasons because patients being unfit for surgery. In contrast, successful inner workings of standardised clinical care planning interventions can lead to adequate preparation or readiness, thus minimising OTDSCs.

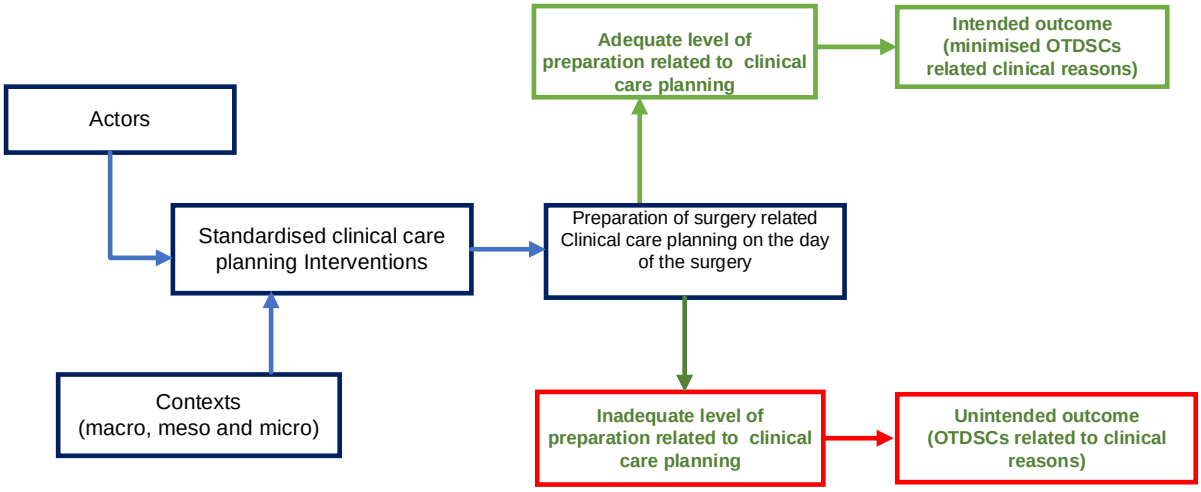


Figure 3.2-1 Conceptualisation of how standardised clinical care planning interventions create OTDSCs due to clinical reasons

Figure 3.2-1 depicts how standardised clinical care planning interventions may create OTDSCs due to clinical reasons. The blue arrows highlight that a diverse set of actors and various contexts (micro, meso and macro) influence standardised clinical care planning interventions, resulting in a series of outcomes related to the preparation of surgery and clinical care planning. Based on the outcomes, various decision-makers decide on preparation and readiness to undergo surgery in relation to different aspects of clinical care planning. The green arrows highlight how contexts of adequate preparation or readiness to undergo surgery in relation to different aspects of clinical care planning might minimise OTDSCs for clinical reasons. In contrast, the red arrows highlight that contexts of inadequate levels of preparation or readiness to undergo surgery in relation to different aspects of clinical care planning can lead to OTDSCs for clinical reasons.

The conceptualisation acknowledges that various actors and contexts can have multiple interactions and feedback loops, but, to simplify the diagram and to communicate the intended message, the interactions are highlighted using a limited number of arrows. Similarly, this conceptualisation can be applied to other types of standardised interventions: patient communication (e.g., patient follow-up guide, interview guide), resource scheduling or allocation (e.g., theatre time allocation tools) and resource protection interventions (e.g., dedicated wards and theatres).

3.3 Overview of epistemological positions

Methodological decisions, such as whether to use a quantitative or qualitative approach or both approaches, are informed, intentionally or unintentionally, by the researcher's ontological and epistemological positions, which can be broadly explained as their philosophy of knowledge. In short, ontology discusses beliefs about the nature of reality and epistemology refers to assumptions about how knowledge can be discovered, developed and communicated (Bradshaw et al., 2017).

In social science, a wide range of ontological (e.g., structural realism, relativism) and epistemological (objectivism, constructionism and subjectivism) positions are available (Moon and Blackman, 2014). The two dominant paradigms widely posited are positivism (or objectivism) and interpretivism (or subjectivism), which are divergent and polarised approaches. Much discussion of ontology and epistemology in social care, including healthcare research, uses these two poles as reference positions or points (Bradshaw et al., 2017). This classification of research philosophies into positivism versus interpretivism is an oversimplification of the philosophy of knowledge, as many hybrid forms exist within social science (Moon and Blackman, 2014).

Critical realism is understood to initiate as a scientific alternative to positivism and interpretivism, drawing elements from both in its account of ontology and epistemology (Cruickshank, 2012; Fletcher, 2017). Nonetheless, realism goes beyond these two contrasting paradigms in recognising that social systems are open where interactions between agency and structure create causal explanations that cannot be described based on empirical regularities alone (Bhaskar, 1978). Critical realism therefore argues that effects or outcomes are generated because of the interactions between social structures, mechanisms and human agency (McEvoy and Richards, 2003). Thus, critical realist philosophy emphasises on the identification of causal mechanisms that explain the social world (Fletcher, 2017).

The main purpose of scientific inquiry informed by critical realist philosophy is to acquire knowledge about causal mechanisms using theories and models to explain how things work beyond the empirical level (Wong et al., 2012; Jagosh et al., 2012). Pawson and Tilley (1997) explicitly conveyed that their contribution to evaluation is distinctive in that it was the first to rest on realist principles and position realist evaluation as “applied scientific realism” (p. 55). Chapter 3 of their book outlined some fundamental notions relating to the scientific realist paradigm, pointing to their proposed realist evaluation (Pawson and Tilley, 1997). However, many argue that Pawson and Tilley (1997) combine scientific and critical realist principles and a pragmatic approach to evaluating policy and social programmes (Mukumbang et al., 2023; Jagosh, 2020). Pawson and Tilley (1997) elicit, refine and test the programme theory related to a policy or intervention to explain how, for whom, why and under what circumstances it works. This explanation is achieved by understanding causative links between the contexts (C), mechanisms (M) and outcomes (O) of interest. Pawson and Tilley (1997) introduced realism as a pragmatic approach to evaluating policy and complex interventions (Mukumbang et al., 2023; Jagosh, 2020).

This research aims to understand how and in what contexts OTDCSs are minimised while embracing the complexity of the interventions and the system. This research investigation therefore has an exploratory ambition that embraces the complexity and develops transferable theories to minimise OTDSCs and unintended outcomes in HDSs. Rather than choosing one philosophical perspective – positivist and interpretivist –the thesis adopted a combined approach which is “realism”. Section 3.5 explains the rationale for using a realist methodology.

3.4 The main principles of a realist methodology

Experimental designs and realist evaluations are well-established but divergent approaches to evaluation (Nielsen et al., 2023). This research investigation uses realist evaluation, and this chapter outlines the methodological processes supporting this. This section explains the main principles or ideas related to realist methodology.

3.4.1 Stratified reality and ontological depth

A realist methodology describes interactions between structure and human agency using terms such as “ontological depth” (Pawson et al., 2014a) and “stratified realities” (Jagosh, 2019). Bhaskar (1975) described stratified reality, visualising it in three interconnected layers: actual, empirical and real. Bhaskar argues that the “empirical” layer of reality can be observed and often measured, but the domain of the “actual” refers to those active mechanisms that result in outcomes and events, whether detected or observed, empirically or not. The “real” layer consists of all types of components that occur, including all causal mechanisms, both active and latent. Bhaskar (1975) argues that mechanisms can be theorised but are not visible or testable until activated. Nonetheless, they can provide useful explanations to enable understanding of social programmes or interventions. Realism can also explain socially constructed entities comprising multiple layers and systems (Westhorp, 2012; Marchal et al., 2013; Pawson, 2013). Empirical data can be used to make inferences about reality but only provides a partial window into reality (Wong, 2013; Jagosh, 2019, 2020).

Positioned closely to critical realism, realist methodology recognises that interventions or social programmes continuously evolve between agency and structure, consisting of broad and multi-layered social processes (Jagosh, 2020; Pawson and Tilley, 1997). Rival theories and multiple causal pathways for different contexts and populations may arise, leading to differential outcomes (Jagosh, 2019). These differential outcomes are not always empirically measurable but are nonetheless worthy of investigation (Pawson and Tilley, 1997; Pawson, 2006). Realists argue for a collective approach to knowledge generation, which is likely to reflect the partial understanding but still potentially significant importance of developing and understanding intended and unintended outcomes in the implementation of social programmes (Jagosh, 2019; Pawson et al., 2011). Applying the ontological depth principle, a realist methodology highlights the limitations of the hierarchy of evidence (Jagosh, 2019). To understand complex problems such as OTDSCs, a realist methodological approach not only acknowledges the stratified

reality that exists in any social system, including HDSs, but also provides an approach to unpack the hidden characteristics using CMOCs (see section 3.4.4).

3.4.2 Emphasis on theory

Pawson argues that social programmes and interventions are “theories incarnate” and a central aspect of any realist review (Pawson and Tilley, 1997; Pawson, 2013). Westhorp (2012) suggested that layers of theories exist in social systems. Substantive theories provide particular value in understanding interventions in open systems in complex social settings. Different types of theories (substantive theory, programme theory and evaluation theory) can assist realist researchers in different ways and with different types of outcomes (i.e., intended, unintended or observed outcomes) (Westhorp, 2012). Realist reviews are explained as theory-led because they look at outcomes from interventions or programmes to develop theories to explain interactions and patterns, then use literature, empirical data and stakeholders to refine the theories (Hunter et al., 2022). They also use formal, substantive and well-established theories to inform theory development (Shearn et al., 2017).

PT is a series of explanations explaining how and why an intervention is expected to work in different contexts or conditions (Shearn et al., 2017). In realism, a PT is the unit of analysis and not the programmes or intervention themselves (Pawson, 2006b). More abstract theories that are testable but general are considered “middle-range programme theories” (Kislov et al., 2019). Substantive theories assist researchers in drawing boundaries around social systems, which tend to explore multiple interactions in different layers (Westhorp, 2012). More substantive ideas about human agency or theory often provide a bridge to a wealth of existing research using middle-range theories to explain testable working hypotheses and various social and organisational behaviours (Merton, 1967). For the research investigation, I have referred to the specific aspects PTs related to how interventions inner working influenced intended or unintended outcomes.

3.4.3 Embracing complexity

Plsek and Greenhalgh (2001) emphasised the limitations of linear thinking and the "clockwork universe" metaphor for solving organisational problems in HDSs. Greenhalgh and Papoutsi (2018) reported that, with a few exceptions, the healthcare research community fails to engage with the underlying logic of complexity theory. Traditional views of healthcare organisations have oversimplified challenges and have a limited ability to understand organisational problems (McDaniel and Driebe, 2001; Mannion and Braithwaite, 2012; Braithwaite, 2018). Kuhn (2009) emphasised that complexity conceptualisation tends to remove the simplistic view of ordered and controlled existence and provides an approach for identifying patterns of an order and disorder to study systems. Hawe (2015, p. 397) highlighted that traditional and simple perspectives have failed to appreciate contextual factors and argued that failing to understand various dimensions of the complexity and unpredictability of its interactions and outcomes "may blind us to the very mechanisms we seek to understand".

SSCSs are very high-risk clinical systems where care is delivered using a series of interconnected interventions in each care stage with the help of various autonomous actors, including HCPs and support staff. As a result of the systemic interactions of many actors with high levels of clinical autonomy, these systems tend to demonstrate non-linear emergent behaviours (Caffrey et al., 2016). Most scheduled care settings share critical resources (surgeons, anaesthetists, theatre practitioners) with emergency and semi-emergency care patients. As a result of resource sharing and a high number of interactions in the surgical care environment, as well as significant financial pressures and policy changes, high variability and complexity have emerged. This leads to behaviours demonstrated in complex systems, such as non-linearity and self-management (Caffrey et al., 2016; Chandler et al., 2016; Mahajan et al., 2017).

With a few exceptions, most evidence generated around effectiveness and the delivery and management of surgical care considers the hospital a factory-like or simple system(Cook et al., 2014; Litvak and Long, 2000; Valsangkar et al., 2017;

Brown et al., 2019). Mahajan et al. (2017) have argued that SSCSs are not factories but Complex Adaptive Systems (CASs). Studies have highlighted that SSCSs demonstrate CAS characteristics, as do many HDSs, such as emergence, self-organisation and development of unpredictable outcomes using non-linear causal relationships (Chandler et al., 2016; Randell et al., 2019; Karemere et al., 2015). Realist methodology recognises complexity at its core and embraces the idea that social systems are inherently complex (Wong et al., 2012; Pawson et al., 2014b).

Interventions operate in open systems, including healthcare, and interact at many levels, from focusing on individual, group and organisational behavioural change to impacting on how they work. Some parts of an intervention may appear straightforward, but a complete intervention can create different feedback loops with more or different powers than the aggregate powers, potentially creating new paradoxes of outcomes, including unintended consequences (Chandler, 2018). Realist methodology conceptualised the labyrinth of interactions as unpacking the "black box" where the inner workings of the intervention or logic of a programme can help to understand in what contexts, how and why an intervention produces independent outcomes (Astbury and Leeuw, 2010a). Even relatively straightforward interventions operating in open systems can produce a wide variety of intended and unintended outcomes, regardless of the success of the implementation (Astbury and Leeuw, 2010). Pawson (2013a) introduced the VICTORE framework to understand the complexity of social programmes, which consisted of seven dimensions – volitions, implementation, contexts, time, outcome, rivalry and emergence. As highlighted in the introduction chapter under motivation, my personal experience within the NHS has motivated me to embrace complexity. Taking all of this into account, the research investigation embraces complexity using realist methodology. Realist methodology uses a wide variety of evidence integrated with theory to unpack the ontological depth with the help of CMOCs(Pawson, 2013).

3.4.4 Overview of “trio of explanatory components”: context, mechanism and outcome

Many authors (De Weger et al., 2020), including Gilmore et al. (2019), argue that it is vital to conceptualise the “trio of explanatory components” (De Souza, 2013): context, mechanism and outcomes based on the research objectives. Table 3.4-1 below explains how the research process defines these components.

The CMOC provides the template central to analysis, theory building and the refining process in a realist approach (Pawson, 2006b). Pawson highlighted that the context–mechanism–outcome configuration is an “ugly circumlocution”, noting the importance of maintaining the configuration rather than focusing on individual parts (Pawson, 2013). When realist studies were originally developed, CMOCs were outlined as a heuristic to aid researchers in presenting causal explanations consistently (Pawson and Tilley, 1997; Wye et al., 2014; De Weger et al., 2020; Kastner et al., 2019). CMOCs develop the relationships between context, mechanism and outcome patterns while setting out causal explanations about data in a particular programme that can be related to a whole programme or part of a programme (De Weger et al., 2020). One CMOC might be embedded in another or provide context to configure other CMOCs, creating “ripple effects” (Jagosh et al., 2012) and providing a chain of implementation steps (Shaw et al., 2018).

Contexts can also be identified as the “backdrop” (Jagosh et al., 2012)to programmes that support or hinder intended outcome patterns, and context variation can trigger the same mechanism, creating different outcome patterns (Pawson and Tilley, 1997). Context is a critical concept in understanding the inner working of social programmes and interventions, but its conceptualisation has received less consideration (Greenhalgh and Manzano, 2022). Context can be identified as observable or empirical features (e.g., place, people, things) triggering or hindering interventions, assuming that context operates in one moment and sets a chain of events in motion (Greenhalgh and Manzano, 2022). Context can also demonstrate relational and dynamic characteristics that define the mechanisms through which the intervention works, assuming that context operates dynamically over a period at

multiple social system levels (Greenhalgh and Manzano, 2022). The study conceptualises context as having relational and dynamic characteristics. Programmes and interventions are embedded in a layer of contexts consisting of micro- (e.g., patients undergoing surgery with complicated clinical needs and from various ethnic minority backgrounds), meso- (e.g., organisational culture, competency and staff workload) and macro- (e.g., austerity measures, using national performance indicators or lack of social care resources) contexts.

A mechanism is a generative force that brings about outcomes linked to but not synonymous with interventions or programme strategies (Jagosh et al., 2012). Pawson and Manzano-Santaella (2012,p 187) differentiate between mechanisms from interventions as follows: “under realism, mechanisms are not regarded as the multiple components of combined interventions”. Rather, mechanisms penetrate to the layer beneath, attempting to explain how particular measures work.” Identifying mechanisms helps to go beyond describing “what happened”, instead theorising about why and how it happened, for whom, and in what context (Jagosh et al., 2012; Shaw et al., 2018). Pawson also identified that a mechanism is not a variable but has an explanatory role responsible for creating patterns of outcomes (Pawson and Tilley, 1997). Mechanisms are usually unobservable because they operate in different “stratified realit[ies]” and different timescales, depending on the interaction of components (Westhorp, 2018). Mechanisms are, therefore, hidden and not easily identifiable (Lacouture et al., 2015) or “visible” but must be inferred from observable data (Wong et al., 2012).

Bhaskar (2013, p. 3) claims that “generative mechanisms […] must be analysed as the ways of acting of things, and their operations must be understood in terms of the exercise of tendencies and causal powers.” However, Pawson and Tilley (1997) suggest that mechanisms are identified in the “resources and responses” of programme participants in programme activities, while the relationships between these individual “resources and responses” arguably constitute the mechanism (Dalkin et al., 2015; Shaw et al., 2018). Several authors expand the role of the mechanism beyond the individual reasoning of participants at different levels of the

system (Shaw et al., 2018; Marchal et al., 2012; Dalkin et al., 2015; Astbury and Leeuw, 2010b). DeSouza (2013, p.146) asserts that “it is possible to suggest that mechanisms in an action context are located within the institutional structure, culture, agency and the relational properties between them”. Mechanisms work at different levels in systems, and some mechanisms change the decisions of governments, political structures and power relationships within systems (Dalkin et al., 2015; Emmel et al., 2018; Falleti and Lynch, 2009).

Alternative conceptualisation of mechanisms go beyond “resource and response” and argue that it is necessary to study mechanisms on different levels where mechanisms operate but remain within the underlying principles of realism (Westhorp, 2018). This thesis identifies mechanisms with the following characteristics: “the ways of acting things” (Bhaskar, 2013) – not a variable but with an explanatory role (Pawson and Tilley, 1997), usually invisible to human experience. Real entities, however, must be inferred from observable data (Lacouture et al., 2015; Wong, 2013), triggered by context (Pawson and Tilley, 1997; Pawson, 2013), sensitive to variations in context and able to generate outcomes (Pawson and Tilley, 1997; Pawson, 2013), and existing at different system levels (Shaw et al., 2018; Marchal et al., 2012; Westhorp, 2018). Mechanisms can also refer to any underlying determinants or social behaviours activated in specific contexts (Mukumbang et al., 2019).

Context variations trigger a mechanism that creates different patterns of outcomes (Wong et al., 2012). These can be intended (i.e., desired) or unintended (i.e., undesired) outcomes of interventions, and can be intermediate or final (Jagosh et al., 2012; Mukumbang et al., 2019; De Weger et al., 2020). This thesis focuses on understanding how to minimise OTDSCs, which represent an unintended outcome in SSCSs. Various contexts trigger mechanisms and create patterns of outcomes that influence OTDSCs. For explanatory purposes, the thesis identifies three types of outcomes: main outcomes (e.g., OTDSCs), intermediate outcomes (e.g., adherence to care, anxiety and trust), and additional outcomes (e.g., patient experience or theatre utilisation). Intermediate outcomes directly influence OTDSCs and increase

the risk of OTDSCs. For example, a high level of adherence to care can reduce OTDSCs resulting from incidences of DNA. Additional outcomes are not directly related to OTDSCs but can be useful in understanding the patient experience or theatre utilisation.

Mukumbang et al. (2018) argued that the CMOCs proposed by Pawson and Tilley (1997) include components of the “actors” and “interventions”. The thesis adopted the ICAMO heuristic tool, as summarised by the terms in the examples in table 3.4-1. Some of the definitions of the elements in table 3.4-1 were adopted from Mukumbang et al. (2018). As with CMOCs, the ICAMO heuristic tool mainly offered fundamental building blocks and was applied in the thesis as a useful model for analysis, which includes retroductive and abductive thinking processes. The ICAMO heuristic tool is used to analyse and present causal statements. Regarding the ICAMO heuristic, mechanisms are used to elucidate how the intervention or part of the intervention explains in a particular context and relative to the actors to produce a series of outcomes (intended or unintended) (Mukumbang et al., 2019).

Elements of the ICAMO heuristic tool	**Definition**	**Examples from SSCSs**
Interventions	A combination of programme components designed to produce changers in behaviours or improve health status among individuals or group members.	Standardised clinical care planning interventions including pre-assessment tools and clinical protocols used to clinically prepare for surgery. Standardised communication interventions such as patient interview guides and scheduling tools.
Actors	The individuals, groups and institutions that play a role in	Anaesthetists, PONs, surgical nurses, administrators, surgeons and theatre practitioners.

Elements of the ICAMO heuristic tool	Definition	Examples from SSCSs
	implementation and outcomes.	
Context	The salient conditions are likely to enable or limit the activation of mechanisms.	Micro contexts - Clinical autonomy of nurses, Macro contexts - various NHS policies (e.g., waiting list targets and austerity measures) and Meso -contexts - organisational conditions (e.g., high workload and inter-professional collaboration).
Mechanism	Any underlying determinants of social behaviour activated in certain contexts.	Patients' trust in the surgical teams, compassion or self-efficacy among PONS towards patients undergoing surgery, anaesthetist trust in clinical preparation among patients undergoing surgery.
Outcomes	Expected (i.e., intended outcomes) or unexpected effects (i.e., unintended outcomes) of interventions.	Individualisation of care related to clinical preparation of patients undergoing surgery (intended outcomes) and individualisation of care related to resource preparation associated with undergoing surgery (intended outcomes), OTDSCs, delayed discharges (unintended outcomes).

Table 3.4-1 Definitions of the elements and examples of the ICAMO heuristic tool.

3.5 Rationale for choosing realist methodology

Unintended outcomes, which are widely reported, are embedded in interconnected labyrinthine structures that epitomise complexity, where multiple layers of contexts contribute to their creation. These are challenging to understand and produce evidence that could ultimately help to prevent such outcomes. Pawson (2013) argues that realist methods provide a coherent methodological approach to tackling complexity while appreciating context sensitivity and producing transferable knowledge using theory-based evaluation. As highlighted in section 3.4, realist methodology addresses the core of complexity. One of the main reasons for choosing a realist methodology rather than a more traditional systematic review was because it is well suited to understanding complex problems in HDSs.

Realist reviews are explicitly theory-driven, recognising that it may be more fruitful to use underlying programme theories to understand how and why particular programmes or interventions are utilised rather than whether they work (Wong et al., 2012; Hunter et al., 2022). SSCSs are known to demonstrate high variability and uncertainty because of specialisms, processes, delays, resource limitations and patients' diverse medical conditions (Van Riet and Demeulemeester, 2015). As a result of the systemic interactions of many actors with high levels of clinical autonomy, these systems tend to demonstrate non-linear emergent behaviours and are unpredictable in nature (Caffrey et al., 2016). As highlighted in section 2.4.4, SSCSs are under significant pressure to minimise unintended outcomes and improve quality while managing increased demand. The autonomous actors in the system create various feedback loops and emergent behaviour; at critical levels, a small change can make a significant difference and act as a tipping point and unintended consequences (Rouse, 2008). SSCSs all over the world, even in specific local healthcare settings, are continuously influenced by various contextual factors. Another reason for using realist methodology is that it helps to provide transferable explanations while embracing complexity (Hunter et al., 2022; Wong, 2013).

CMOCs or combinations of CMOCs can provide an explanation for how and why context interventions or social programmes work (Wong et al., 2015). There are also

other theory-driven approaches for evidence synthesis: critical interpretive synthesis and narrative synthesis (Kitson et al., 2013), meta-ethnography (Kvæl et al., 2022) and meta-synthesis (Wu et al., 2021). However, these alternative approaches would not help to identify causal mechanisms or the influence of contexts that influence OTDSCs.

It is widely acknowledged that no intervention is likely to be “simple” in real care settings (Moore et al., 2015; Craig et al., 2008). The MRC states a complex intervention may often require modification or adaptation based on the contexts and actors delivering and receiving the intervention, which can lead to differential outcomes (Skivington et al., 2021; Craig et al., 2008). Scientific realism was specifically developed to embrace complexity and help researchers, policymakers, and practitioners make sense of complex interventions (Pawson and Tilley, 1997; Salter et al., 2010).

Despite the many advantages of tackling complexity and developing transferable explanations, it is widely acknowledged that realist reviews are time-consuming and resource intensive and create methodological challenges (Pawson, 2006b; Hunter et al., 2022). Pawson (2004) provides an early warning that realist reviews are “not for novice” researchers. The realist approach could explain complex behaviours, such as emergent behaviours, because of interactions between structure and human agency outcomes at different levels of complex systems (Prashanth et al., 2014) and long causal chains that explain intended and unintended outcomes (McDaniel et al., 2009; Shaw et al., 2018). The realist approach has the flexibility to embrace system complexity and is used to unpack interventions and find pragmatic and alternative approaches (Wong, 2013; Rycroft-Malone et al., 2012). Realist methodology, therefore, provides a flexible approach to investigating a variety of choices, decisions, behaviours, actions, settings and differential outcomes when actors interact with interventions such as pre-assessment tools or protocols.

The realist approach does not focus on the effects, size or quantification of pieces of evidence based on strict criteria (Pawson, 2006a). Instead, the data is used to identify theories and “falsify or modify or validate” them, explaining how and why interventions produce patterns of outcomes in various contexts (Pawson and Manzano-Santaella, 2012). The realist approach is method-neutral (Marchal et al., 2012). Another advantage of using the methodology is the ability to use diverse international evidence from various care environments from a wide range of disciplines and methods (i.e., qualitative and quantitative) related to OTDSCs. One of the practical advantages of choosing a realist methodology, particularly for stand-alone novice researchers, is the existence of growing and active peer support networks such as the RAMESES (Realist and Meta-narrative Evidence Syntheses: Evolving Standards) email list and the Centre for Advancement in Realist Evaluation and Synthesis (CARES).

3.6 The realist process

Realist evaluation involves four core steps: articulating and identifying PTs for refinement/testing, collecting relevant data to test hypotheses, testing hypotheses, and refining hypotheses (Brousselle and Buregeya, 2018). In this study, the four steps covered in the five phases of the research process are briefly outlined in Chapter 1 (refer to figure 1.4 1). The study followed a previously detailed protocol and is registered with the PROSPERO database [Ref: CRD42019124272]. A detailed discussion of each phase is provided here.

3.6.1 Phase one – aims, designed and research questions

By studying OTDSCs, the study aims to understand how to minimise unintended outcomes in HDSs. See research questions in section 1.2. The initial work completed prior to the realist evaluation identified that previous work completed on OTDSCs is weak in theory development and descriptive (refer to section 2.5). The study, therefore, focuses on developing transferable knowledge or theories about minimising OTDSCs and developing programme theories. The long-term aim of the research is to develop theory-driven, evidence-based interventions to minimise OTDSCs and other unintended outcomes in HDSs.

However, one of the barriers related to OTDSCs was their multi-factorial nature (i.e., a wide variety of reasons related OTDSCs). The study, therefore, focused on developing transferable theories that focused on OTDSCs. The first step was to provide a transferable categorisation of OTDSCs, which is the aim of the first research question. As highlighted, OTDSCs create substantive suffering, and, in line with the aim of the study, RQ2 and RQ3 were identified. During phase three of the study, it came to light that tensions between the standardisation and individualisation of care can result in OTDSCs and many other unintended outcomes. To focus on this area, RQ4 was introduced.

Use of multiple methods is recommended to unpack complex and challenging problems such as OTDSCs (Westhorp, 2012). The study was therefore divided into phases to maintain transparency and organisation (including logistics). The realist approach tends to be flexible in study design and supports phased approaches (Rycroft-Malone et al., 2012).

The proposed or initial study design consisted of six phases, with the sixth phase being a comparative study to understand the prevalence of OTDSCs among NHS trusts using patient-level data. Although most of the data collection was completed, phase six had to be abandoned because of COVID-19 interruptions. The next section describes the research process, which consisted of five phases.

3.6.2 Phase two – scoping, mapping and developing IPTs

Realist reviews tend to achieve theory gleaning by non-systematic scoping, exploring the literature and consulting with the main stakeholders (Hunter et al., 2022). Focusing or scoping the review is considered the most valuable exercise as it sets the scene for the study but represents a challenging and time-consuming step in the realist process (Pawson, 2006; Greenhalgh et al., 2014). One of the main challenges of developing a framework or scoping for a realist review is finding a specific level of abstraction that allows the researcher to stand back from the detail and variation in

the evidence, but that is also detailed enough to meet the aim and objectives of the review (Rycroft-Malone et al., 2012).

Phase two used a multi-method approach, including a wide variety of literature, findings on the feasibility study, and feedback from patient representatives and expert practitioners. For organisation and presentation purposes, phase two was divided into three sub-phases. In sub-phase one, preliminary IPTs were identified from carefully selected samples of OTDSC literature (n=35). The preliminary IPTs identified in sub-phase one were further refined using multiple methods. The findings on the feasibility study included results from eight NHS trusts, two feedback events with patient expert advisers (n=6) and eight expert practitioners (n=8). In phase three, all the evidence relating to OTDSCs was considered for developing the taxonomy and the IPTs.

In realist reviews, the theory-gleaning process is subjective and iterative (Pawson, 2006; Hunter et al., 2022). Phase two aimed to map the territory to understand the scope of the study and develop IPTs, which were to be refined later using empirical data and literature. To achieve the aims, phase two focused on understanding OTDSCs from a wide range of views or perspectives from literature and stakeholders. Phase two was the study's longest, most intense phase and was completed between March 2018 and February 2020 (i.e., before hospitals were affected by the COVID-19 pandemic). As highlighted in section 2.4.4, during this time, NHS hospitals in England were severely affected by austerity measures, high emergency admissions and delayed discharges, which caused significant problems with data collection and engagement with stakeholders.

Pawson (2006) recommends exploring the literature to understand how the programme or phenomenon is intended to work, what components might be important and what aspects are likely to help or create barriers. In the first sub-phase, the aim was to understand existing evidence related to OTDSCs and map the scope using literature to understand any existing theories and concepts developed

by preliminary IPTs. In the first sub-phase, the literature review involved three forms of searches to identify related evidence: traditional database searches, searches of selected websites and supplementary searches. The following three databases were used to search for relevant studies: Scopus, Cochrane and Cinahl Plus. Searches were reduced to human studies and papers published in English without limiting them to a time period. Further website searches were carried out using keywords in the following websites: the King's Fund, Social Care Institute for Excellence (SCIE), NHS Improvement and the Nuffield Trust. These website searches used the search functions available on the websites concerned.

Three papers (Dimitriadis et al., 2013; Al Talalwah and McIltrot, 2019; Wong et al., 2018) identified from the database searches were used in the supplementary search. Articles were chosen based on relevance to the research questions and applicability to the context of the English NHS. To gain a broader understanding, papers were considered based on relevance to NHS context (Wong et al., 2018), comprehensiveness (Al Talalwah and McIltrot, 2019) and number of citations (Dimitriadis et al., 2013). The reference lists (Dimitriadis et al., 2013; Al Talalwah and McIltrot, 2019; Wong et al., 2018) for the three articles were examined to identify additional articles not found in the database keyword search.

The final version of the search strategy is shown in the table below (see table 3.6.1).

Search query used	"surg*" OR "elective activit*" OR "elective procedure*" OR "operation*" AND "cancel*" OR "terminate*" OR "reschedule*" OR "abandon*" AND "health*" OR "hospital*" OR "acute care"
Database searched	Scopus, Cochrane, Cinahl Plus
Exclusion criteria	Non-human studies Languages other than English

Table 3.6-1 Summary of search strategies used for databases

Globally, scheduled surgical care is delivered in many care settings, including community, district and secondary settings, academic hospitals and veterans' administrative centres, incorporating a wide range of patient communities (e.g., those from different socio-economic levels and ethnic minority backgrounds) and healthcare economies (those accessing regulation care and free-at-the-point-of-care treatment). Available international evidence related to OTDSCs is, therefore, diverse and context sensitive. The main aim of this review is to embrace the complexity of SSCSs and relevant diverse evidence, identifying interventions, behaviours, concepts and theories that can explain why these OTDSCs happen and how to minimise them.

The main purpose of the review was to capture a diverse set of literatures and use systematic searches to identify relevant studies. Unlike systematic reviews, which are based on exactly defined research questions, the scope of the literature review was broad and subjective. The inclusion criteria were broad and flexible: "Could this article provide useful information about transferable patterns, interventions, behaviours, concepts or trends that understand or minimise OTDSCs?" Purposeful sampling was used to capture studies from a wide range of care settings and research designs to develop exploratory and transferable IPTs. The rationale for using a purposeful sample was to embrace the richness and breadth of available literature on OTDSCs. Another advantage of a purposeful sample is the ability to choose studies from different designs: single-centre, literature-related (commentaries and viewpoints) intervention studies and cohort studies.

All three database and website searches were conducted during March 2018 and updated in November 2019. In total, around 3,100 articles were retrieved from databases and websites. In all, 2,900 articles were excluded based on title and abstract for failure to meet this criterion, and, after removing duplicates, the rest of the articles (around 150) were used for full-paper screening. Most of the excluded articles explain various cancellations or re-scheduling procedures, such as procedures completed in out-patient clinics, radiotherapy treatments and various diagnostic tests (e.g., X-rays, CT scans). Some of the website articles highlighted the

impact and importance of minimising OTDSCs but failed to provide any useful information to minimise them.

From the literature review and selected samples of OTDSC literature (n=35), the data was extracted. For each study, data was extracted into a table consisting of six columns: reference, title of study, country, information related to care setting, study design, findings and patterns related to OTDCSs or description of intervention, and overview of who did what when, the main findings and how interventions might and should work (i.e., applying “realist logic”). This information was usually found in the methods, findings and discussion sections of the papers included for full-paper review. The data extraction tables (4.2-1 to 4.2 -3) are highlighted in Chapter 4. For all the empirical studies (except the evidence review), the quality was appraised using the mixed methods appraisal tool (MMAT) (Hong et al., 2018) (refer to appendix 3.6.2).

Data synthesis was an iterative process consisting of a multi-stepped approach to identifying and organising information to answer RQ1 and identify IPTs. The preliminary analysis was inductive, classifying content into abstract categories, such as interventions, clinical specialities, actors and different categories of OTDSCs. In the first instance, the absence of any comprehensive evidence reviews or conceptualised frameworks related to OTDSCs created a number of challenges to starting the theory-gleaning process. As highlighted in this section, the ICAMO heuristic tool was used to organise data and understand interactions between them. The iterative analysis identified various themes related to OTDSCs and five preliminary IPTs (see section 4.4).

Unlike systematic reviews, realist reviews encourage the involvement of stakeholders (Wong, 2018). Sub-phase two aimed to refine preliminary IPTs to understand why OTDSCs are happening and how to minimise them based on various stakeholders’ views, such as NHS managers, HCPs and patient representatives. In sub-phase two, data was collected using three methods. The

findings of the feasibility study thus include data from eight NHS trusts, two feedback events with patient representatives (n=6) and theorising with eight expert practitioners (n=8). From the combined findings, themes were summarised (see sections 4.5 to 4.7). Table 3.6-1 provides an overview of each method, including aims and how data was collected, sampling and stakeholders, rationale for using the methods, and how the data was analysed.

Increasing patient and public involvement is a major element of health policy to design better care systems, especially in taxpayer-funded health systems (Ellins, 2012, 2011). A significant and growing body of evidence demonstrates that patient involvement can improve patient safety and intended care outcomes (Abrams et al., 2021; Ellins, 2012; Park, 2021). Not surprisingly, patient and public involvement has also increased patient satisfaction and experience (Ellins, 2012; Park, 2021). Health literacy is fundamental to patient engagement, which includes understanding, obtaining and processing relevant information (Coulter and Ellins, 2007). Patient representatives who participated in the feedback session had a wide range of professional experience in various areas (e.g., councils, education) and familiarity with hospital processes, including dealing with patients' complaints and compliments. Realist reviews encourage patient and public involvement in research design (Abrams et al., 2021).

The most widely used methods in realist reviews are qualitative methods, including interviews (Renmans and Pleguezuelo, 2023). Focus groups also provide valuable tools for realist evaluators for use at various stages of the realist process (Manzano, 2022). As part of the first step, two patient stories were presented to the patient representatives to discuss which organisational behaviours and policies contributed to different OTDSCs. In social science, group-focused practices can be challenging, especially maintaining transparency and rigour in the analysis(Cyr, 2016). As part of the validation purpose , the patient representatives' feedback was documented in flip charts in both sessions. A summary of the findings of the iterative analysis was then presented on flip charts and discussed with patient representatives during the feedback events to avoid any misinterpretation (Appendix 3.6.2).

Method	Overview of method	Aim of using method	How data analysis was completed
Feasibility study	Eight NHS trusts participated in the feasibility study. The feasibility study was part of a multi-centre study to obtain patient-level data related to OTDSCs. As part of the feasibility study, NHS trusts submitted the requested details related to how they categorised and reported OTDSCs in their internal systems. The feasibility study also provided an important platform to communicate and engage with a wide range of NHS managers. The opportunity to communicate with NHS managers helped validate various working theories or hypotheses, including three categories of OTDSCs based on three types of actors. As a result of	The main data collection aim was to understand how NHS administrators and leaders viewed and managed OTDSCs in NHS organisations with a specific interest in understanding how NHS hospitals categorised and reported OTDSCs reasons.	The analysis aimed to make sense of how reasons for OTDSCs are used in NHS hospitals. The data collection identified that OTDSCs are a significant problem in most NHS trusts, with most trusts participating in the feasibility study highlighting that their OTDSC rates are around 10% to 15%. The analysis helped to understand obstacles related to the categorisation of OTDSCs. The feasibility study found that the number of reasons given by trusts for OTDSCs varies from 18 to 76.

Method	Overview of method	Aim of using method	How data analysis was completed
	COVID-19 interruptions and data quality issues, the multi-centre study was abandoned (i.e., sixth phase). The data was collected in 2018 between January to May. **Additional notes related to feasibility study and phase six -** The initial study design consisted of six phases but only completed five. As part of the sixth phase, the initial inspiration was to perform a multi-centred quantitative study using patient-level data (phase six). However, it was challenging for several reasons: OTDSCs are a very sensitive phenomenon, and there is wide variation in how NHS trusts		

Method	Overview of method	Aim of using method	How data analysis was completed
	report ODTSCs' reasons in information systems and data quality issues (missing values and discrepancies in systems). In addition, COVID-19 has created further challenges to engaging with NHS trusts. The first part of the phase six is to complete a feasibility study. The study only completed the initial part of phase six (i.e., a feasibility study that collects OTDSC reasons from eight NHS trusts). The data from the feasibility study was used to develop IPTs (section 4.5). The data collected from the feasibility study also helped to understand how NHS trusts record cancellations in their clinical and patient systems and the obstacles related to categorising		

Method	Overview of method	Aim of using method	How data analysis was completed
	OTDSCs. The data collected (different OTDSCs reasons) helped to develop various IPTs and engaged with experienced senior leaders and HCPs.		
Two feedback events with patient representatives (n=6)	Two feedback events were completed to gain the patient representatives' feedback, with the focus on why OTDSCs are happening and how to minimise them. All six patient experts worked in different NHS organisations as volunteers and had many interactions and experiences with a wide variety of patient cohorts, including patients who have experienced OTDSCs. The first session tried to capture a wide range of information to understand	Patient representatives were chosen as they tend to have a broader understanding of the challenges faced by patients undergoing surgery. The data collection focused on understanding patients' perspectives on minimising OTDSCs using patient experts' views patient representatives were involved as evaluators, consumers and co-producers(Ellins, 2011).	While working with patient representatives, the information was captured in flip charts and notes were analysed to understand how different types of OTDSCs were categorised and minimised. Usually, feedback sessions require flexibility and significant logistical work but have proven to be useful (Coulter and Ellins, 2007). The patient representatives were one of the first groups to point out how tension between standardisation

Method	Overview of method	Aim of using method	How data analysis was completed
	OTDSCs. Each patient representative was given an opportunity to provide feedback on how various policies and organisational contexts create OTDSCs and how to minimise them. The second session provided a summary of the findings of the previous session. Working with patient experts, the second feedback session was used to develop working theories or hypotheses to understand how different types of OTDSCs happen. Each session lasted around one and a half hours, excluding the break. The information was captured in flip charts, and notes were taken. The researcher completed all the		and individualisation care might lead to different types of OTDSCs and various other unintended outcomes. Further, patient representatives highlighted that failure to attend surgery can influence trust between the clinical team and patients.

Method	Overview of method	Aim of using method	How data analysis was completed
	organisation of the session, which was funded by NIHR, and facilitated it. The data was collected from April 2018 to November 2018.		
Theorising with eight expert practitioners	Inspired by the 5 Whys technique (Card, 2016), the theorising exercise involved the researcher using a series of why questions to understand how various concepts and interactions contributed to different types of OTDSCs. The preliminary IPTs were presented to expert practitioners. For example, every time a participant provided an answer, a why question was presented. The approach helped to understand various concepts and how they	This method focuses on capturing the knowledge of expert practitioners to understand why different types of OTDSCs happen and how to minimise them. The rationale for using a method similar to the 5 Whys technique was to understand the ontological depth related to OTDSCs.	The iterative analysis was conducted using diagrams and notes, identifying several themes. There are some limitations to using the 5 Whys technique (Card, 2016), but it helped to understand how various structures and agencies embedded in HDSs initiate OTDSCs. For example, different aspects of inadequate individualisation of care lead to different types of OTDSCs, and behaviours such as self-efficacy

Method	Overview of method	Aim of using method	How data analysis was completed
	interact with each other. Practitioners with more than ten years of experience working in surgery were involved in the exercise. Five clinical (one surgeon, two PONs and an anaesthetist) and three non-clinical (middle-level managers) expert practitioners were involved in the exercise. All the theorising exercises were completed as a fact-finding mission. All the information is captured as a diagram using notes. The data was collected from November 2018 to March 2019.		and compassion among HCPs are critical to minimising OTDSCs.

Table 3.6-2 Overview of each method used in phase three.

Sub-phase three brought all the evidence together to refine the preliminary IPTs further. In practice, it was not possible to generate a clear difference between the three sub-phases because of time limitations and logistical reasons. There was some overlap between the three sub-phases as the same researcher conducted all the work, including the analysis. The ICAMO heuristic tool was used as a framework to refine the preliminary and synthesised IPTs. The IPTs identified that different types of standardised interventions (clinical care planning, communication and scheduling), inner working are linked to categories of OTDSCs (see section 4.9). The iterative analysis found various contradictory themes related to minimising OTDSCs. For example, some managers argue that a high standardisation of care minimises OTDSCs due to clinical reasons. Patient representatives and some expert practitioners suggest a high level of individualisation or patient-centred care approaches related to clinical care-minimised OTDSCs for clinical reasons. The main themes related to the analysis were summarised in clip charts (appendices 3.6.2).

The synthesis identified that, when delivering standardised interventions, the tension between standardisation and individualisation of care leads to unintended outcomes such as OTDSCs. Inadequate levels of individualisation of care appear to initiate different categories of OTDSCs. Focusing on actors who initiate different types of OTDSCs is also useful. The end of phase two incorporated development of a taxonomy for OTDSCs and prioritisation of IPT 1. The analysis focused on using “if and then” statements and identified a wide variety of these statements to demonstrate interactions at different levels, including organisational, group, patient and HCP level. Most of the interview data highlighted that NHS policy negatively influences organisational contexts but provided limited explanations of mechanisms or how, why and in what contexts OTDSCs are influenced or minimised.

Further, the analysis based on “if and then” statements provides a wide variety of potential ideas related to OTDSCs. Still, it was challenging to incorporate ICAMOCs directly related to the IPTs (i.e., the inner workings of the standardised interventions) and the research questions because of the large body of data. Different types of

standardised interventions (e.g., clinical care planning, scheduling, communication) are used to prepare patients for surgery. Consequently, a large number of “if and then” statements were developed. At this stage, I received several mentoring sessions from Dr Justin Jagosh to improve the analysis. He encouraged me to develop a framework as a starting point to analyse data and explain the connections between the contexts and inner workings of the interventions and explore various intended and unintended outcomes (i.e. different types of OTDSCs, delays to starting surgery and delayed discharges). The aim of the framework was to organise data based on type of standardised interventions to identify common patterns, which helped to identify transferable theories and focused on several “if and then” statements, enabling them to be further developed as ICAMOCs.

The development of the framework was a multi-step, iterative and evolutionary process that included informal and ad hoc conversations with other doctoral researchers and expert practitioners (figure 3.5-1). The framework was presented at the 2019/2020 CARES conference to other doctoral students and early career researchers for further feedback.

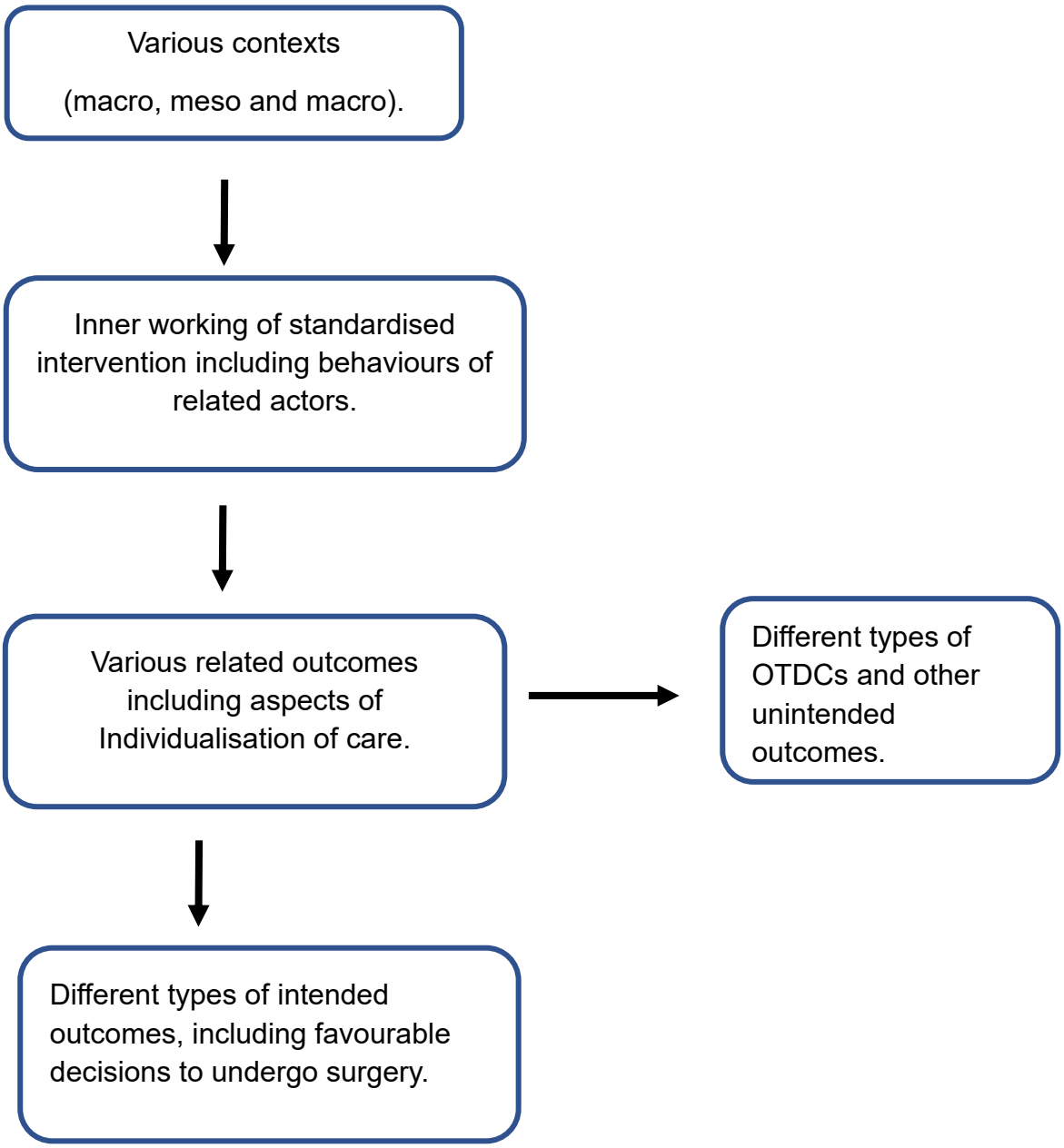


Figure 3.6-1 Framework developed to analyse interview data.

The framework identified five interconnected main components contributing to different OTDSCs: macro-, meso- and micro-contexts; the inner workings of standardised interventions, including behaviours of related actors; various outcomes including a range of aspects of individualisation of care (e.g., clinical care planning, scheduling resources and communication); and different intended and unintended

outcomes. This working framework helped to organise and analyse the interview data in phases two and three, especially in understanding the various levels of abstraction and applying retroduction.

The framework (figure 3.5-1) evolved further, providing clarity to improve the conceptualisation of the research process highlighted in section 3.2. The ability to apply the conceptualised framework was validated or refined with several interview transcripts. The conceptualised framework was presented with preliminary analysis at the online realist conference in 2021 held in Dublin as part of the knowledge café, where several realist methodologists provided feedback, including Professor Pay Pawson and Professor Bruno Marchal, to improve the iterative analysis further and develop qualitative models.

3.6.3 Phase three

In phase three, 28 semi-structured interviews were conducted with a wide range of clinical and non-clinical healthcare workers to refine IPTs. In line with the realist approach, the interviews were completed using the “teacher and learner” method (Pawson, 1996; Manzano, 2016). The average interview time was around 40 minutes, and the interview participants consisted of surgeons, anaesthetists, managers and nurses.

3.6.3.1 Realist interview process

As explained in section 3.4.2, the realist approach is a theory-driven approach that aims to uncover regular patterns producing outcomes and offer a comprehensive understanding of these patterns by offering in-depth explanations and discovering generative causal mechanisms (Marchal et al., 2012).

To embrace the complexity of the systems and develop theories, the interview technique comprises the “teacher learning function” and the “conceptual focusing function” to maintain a systematic approach to data collection. Theoretical awareness is fundamental to realist enquiry (Pawson, 1996, p. 304). Pawson and

Tilley's (1997) slogan, "I'll show you my theory if you show me yours", captures the core idea of the "teaching–learning function" of realist interviewing. Pawson (2016) suggests that, during a realist interview, the interview participant presents a formal description, or part of the initial programme theory. This includes confirming, validating or refuting the researcher's thinking based on the respondent's ideas (i.e. the conceptual focusing function)(Mukumbang et al., 2019; Manzano, 2016).

By applying the teacher–learner approach, the interviewer is expected to participate in the interview process and "deliberate naiveté actively" is actively discouraged (Bevan, 2014). Pawson (1996) suggests that adopting an active role aids expert subject understanding of how interventions work. Manzano (2016) emphasised that the teacher–learner approach effectively identifies "nuggets of information" that can be used to validate, refine and refute theory (e.g., IPTs or programme theories). In line with the realist interview approach, this exploratory and interactive interview process used an interview guide.

The pre-interview guide (appendix 3.6.3-1), information sheet (appendix 3.6.3-2), and consent form (appendix 3.6.3-3), were sent to each interviewee in advance, and they were asked to choose several statements they would like to discuss in the interview. The pre-interview guide and qualitative interview were piloted with the help of practitioners and doctoral students, and several iterations were made before finalising the qualitative interview schedule (appendix 3.6.3-4). As explained in the information sheet, interview participants were given full personal and organisational anonymity. Interviews were conducted between March 2019 and February 2020.

The realist interview schedule using the teacher–learner approach (appendix 3.6.3) explains the interview process. At the beginning of the interview, the questions focus on capturing experiences related to managing or dealing with OTDSCs. Interview participants were encouraged to explore several "ideas", which consisted of a statement in the pre-interview guide before the interview. Each of these statements were related to an IPT. These "ideas" or statements were presented one at a time to

the participants during the interview. For example, the interviewer suggested that "some organisations use standardised clinical care planning interventions (e.g. structured pre-assessment tools, checklists or pre-assessment tools) that may influence OTDSCs". Research participants were expected to provide various information related to the presented statements. To gain more insight, during the interview, the researcher asked how this idea worked in practice to influenced OTDSCs: Would this idea work in any patient community or hospital? What are the intended and unintended consequences of implementing this? Each interview explored several ideas or statements. Near the end of each interview, participants were asked: Can you think of any ideas or interventions that may influence or prevent OTDSCs?

On some occasions, where an interview participant went outside the "idea", the same question was presented in an alternative way – for example, "How would you explain to a layperson the standardised interventions like clinical protocols or pre-assessment tools you mentioned that influence OTDSCs?". At times, to gain a direct understanding, prompts highlighted various organisational features such as size or type of organisation, patient community, behaviours or organisational contexts, which arguably influence OTDSCs. For example, one interviewee made the connection between lack of adequate time and OTDSCs. The interviewer asked whether they thought lack of adequate time in the clinical consultation between the PON and the patient influenced OTDSCs. This direct approach produces relevant and useful information relevant to the IPTs identified in section 4.9 – particularly asking questions such as how something happened or why do they think something is happening or for interviewees to give a real practice example for a layperson to understand. This improves the relevance of the data and the clarity of the information provided.

3.6.3.2 Sampling strategy and selection criteria

To select interview participants, elements of purposive and convenience sampling were used. Creswell outlines a "purposeful" sampling strategy in which "the inquirer selects individuals and sites for study because they can purposefully inform an understanding of the research problem and central phenomenon in the study" (2007, p. 125). As highlighted in Chapter 2, scheduled surgical care is delivered using

various standardised interventions by many clinical and non-clinical actors who have worked in various professional groups. One of the main purposes of a realist investigation is to understand how things work among actors and structures and identify underlying causal mechanisms (Zachariadis et al., 2013). Pawson and Tilley identify “practitioners” potential informants relevant to the realist approach (1997, pp. 160–161). The notion of “knowledgeability” of interviewees is vital in realist enquiry as it informs “what works” in interventions.

The full list of interview participants is given in table 5.2.2.1, with each participant’s job title, an overview of the organisation, the nature of their role and details of their gender. All 28 participants were from 12 NHS organisations. To maintain the anonymity of the interview participants, information about organisations is not provided. To highlight the organisation that each participant belongs to, each organisation is coded with a letter (e.g., A, B, C). The taxonomy of participants provides a summary of various details relating to the role, professional group, gender, organisation worked with and region to which organisations belong (figure 5.2.2-1).

Purposive and convenience sampling were used to select interview participants. The initial study design has the inspiration to perform a multi-centred quantitative study using patient-level data (phase six). However, completing the full phase six was impossible due to various organisational issues (refer to table 3.6.2). Still,
I completed the initial part of phase six, the feasibility study (see section 3.6.2). As a part of the feasibility study, I invited 18 acute care NHS trusts based on published OTDSC performance (i.e., best and underperforming). The feasibility study provided the opportunity to engage with HCPs and senior leaders from eight NHS trusts. Later in the study, these HCPs and senior leaders who engaged with the feasibility study and fell under the sampling criteria were approached as interview participants. Some of the interview participants introduced and recommended others involved in qualitative interviews. The purposive and convenience allow the approach and identification of various interview participants.

The main sample criteria were over five years of experience managing or working in elective care services in NHS university trusts in England. During the data collection, NHS acute care trusts experienced significant pressures and HCP shortages, especially PONs. Several PONs and similar roles could not participate in the semi-structured interviews due to various operational challenges, such as emergency patients and urgent meetings. On some occasions, they did not have permission from their senior managers. Therefore, it is not feasible to have rigid sampling criteria. In line with the realist approach, the data collection aims to identify various perspectives from various actors related to IPTs. All the interview participants had over five years of experience managing or working in elective care services in NHS university trusts in England.

Most of the interview participants have significant experience in pre-operative care responsibilities and preparing patients for surgery including using standardised clinical care planning interventions. NHS hospitals use various job titles, and some do not reflect their prep-operative care responsibilities (e.g., surgical nurses, matrons, and nurses in charge). Participants 8, 10, 25, and 27 were directly involved in preparing patients for surgery using standardised clinical care planning interventions. Participants 2, 4 and 23 had significant experience developing and improving pre-operative care, where they work closely with PONs. Participants 2, 4, 8, 13, 16, 15, 20, 23 and 28 work closely with PONs or oversee their prep-operative care practices such as clinical supervision, line managers, service improvement or clinical educators. Please see the table 3.6.3.

The total sample consisted of clinical (n=16) and management (n=12) interviewees. Some participants with clinical roles had both clinical and management responsibilities (n=7) (e.g., matron, clinical director and service improvement responsibilities). The group of clinical participants included surgeons (n=6), anaesthetists (n=2) and theatre practitioners (n=2). In total, five nurses from various specialist areas participated in the interviews: two theatre matrons (n=2) and one nurse from each of recovery, surgery and critical care. The participants who worked

in the Clinical Commissioning Group and district general hospitals had significant experience in managing elective care services.

Of the 12 participants with management roles, apart from the commissioner and chief executive, all the others held roles in large university hospitals. Both the commissioner and chief executive had more than ten years' relevant experience of management in university hospitals. Most of the other managers had experience managing pre-operative care services in large university hospitals, including service improvement managers (n=5), operational managers (n=4) and senior leaders (n=3).

Interviews were conducted with participants (n=28) from 12 NHS organisations spread across England: the Midlands (n=12), London (n=6), the South (n=5) and the North (n=5). 16 interviews were conducted face to face, and 12 were conducted over the telephone. Face-to-face interviews were held at venues convenient to interviewees, usually their workplaces.

Roles	Management 12	Clinical 9	Clinical and Management 7		
Job Title	Surgeons 6	Nurses 5	Anaesthetists 2	Theatre Practitioners 2	Emergency Consultant 1
	Improvement Manager 5	Operations Manager 4	Senior Leaders 3		
Gender	Male - 16	Female - 12			
Type of organisations	Large University hospitals 26	Clinical Commissioning Group 1	District General Hospital 1		
Number of participants from each region that organisations belong to	Midlands 12	South 5	London 6	North 5	

Figure 3.6-2 Taxonomy of participants.

Participant ID	Job title	Organisation	Nature of role	Gender
1	Head of Operations	Large university hospital E	Manager	Female
2	Anaesthetist and Clinical Director	Large university hospital B	Clinical and management	Female
3	Head of Commissioning	Clinical Commissioning Group I	Manager	Female
4	Theatre Improvement Manager	Large university hospital C	Manager	Female
5	Chief Executive	District General Hospital D	Manager	Male
6	Director of Performance	Large university hospital A	Manager	Male
7	Surgeon and Clinical Director	Large university hospital A	Clinical and management	Male
8	Theatre Matron	Large university hospital C	Clinical and management	Female
9	Senior Surgical Registrar	Large university hospital A	Clinical and management	Male
10	Surgical Nurse	Large university hospital A	Clinical	Female
11	Deputy Medical Director	Large university hospital A	Clinical and management	Male
12	Site Manager	Large university hospital F	Management	Male
13	Improvement Manager	Large university hospital H	Manager	Male
14	Theatre Improvement Manager	Large university hospital F	Manager	Female

Participant ID	Job title	Organisation	Nature of role	Gender
15	Senior Surgical Registrar	Large university hospital G	Clinical	Male
16	Divisional Manager	Large university hospital F	Management	Male
17	Surgeon	Large university hospital M	Clinical	Female
18	Theatre Matron	Large university hospital F	Clinical and management	Female
19	Theatre Practitioner	Large university hospital H	Clinical	Male
20	Improvement Manager	Large university hospital J	Manager	Female
21	Surgeon	Large university hospital J	Clinical	Male
22	Patient Waiting List Manager	Large university hospital C	Management	Male
23	Associate Director	Large university hospital A	Management	Male
24	Theatre Practitioner	Large university hospital E	Clinical	Male
25	Critical Care Nurse	Large university hospital E	Clinical	Female
26	Surgeon	Large university hospital L	Clinical	Male
27	Nurse in Charge	Large university hospital J	Clinical and management	Female
28	Anaesthetist Register	Large university hospital G	Clinical	Male

Table 3.6-3 Overview of participants.

3.6.3.3 Analysis of interview data

As highlighted earlier in the chapter, a fundamental principle of realist evaluation is that interventions are underpinned by real hidden causal forces (i.e., mechanisms), influenced by contexts and responsible for the generation of outcomes (Wong et al., 2013). To understand causal forces hidden from human experience, the realist approach encourages a “theory-driven model” for researcher interviews, whereby “the researcher’s theory is the subject matter of the interview, and the subject is there to confirm or falsify and, above all, to refine that theory” (Pawson, 1996, p. 299). In line with ontological assumptions, realist analysis focuses on finding and aligning relevant evidence to demonstrate that specific mechanisms generate outcomes and influence relevant contexts (Pawson and Manzano-Santaella, 2012). Data analysis utilises a retroductive approach, which uses both inductive and deductive reasoning, and explores generative causation in interventions and programmes (Jagosh, 2020). The realist approach does not focus on the effect, size or quantification of pieces of evidence. Instead, the data is used to identify theories and “validate/falsify/modify” them (Pawson, 1996), explaining how and why interventions produce patterns of outcomes in various contexts (Pawson and Manzano-Santaella, 2012). It can, therefore, be argued that realist evaluation starts and ends with theory.

This section aims to provide an overview of the data analysis. It is worth noting that, like data preparation, data analysis was an interactive process that evolved over a 10-month period. The interviews generated a large volume of relevant data, which was particularly challenging to analyse because it identified various interesting interactions and patterns operating at different levels, such as policy, system, organisational and group level (i.e., between HCPs) and at patient and HCP level (e.g., PONs and patients undergoing surgery).

First, the interviews were recorded with consent and transcribed verbatim. Each interviewee was allocated a unique code (e.g., Participant 1 (P1) = first interviewee) to allow for anonymisation, and the transcripts were checked again for any other

identifying features and subsequently altered if necessary. The transcripts were then examined for discrepancies against the recordings and anonymised.

Second, all the transcripts were read to gain an overall understanding of the data before data was categorised based on the types of standardised interventions. For example, all the information related to prioritisation of IPT 1 or standardised clinical care planning interventions was categorised to identify various patterns, interactions and behaviours and thus identify various fragmented data referred to as dyad (M–O, C–M, C–O) and triad (CMOC) methods, widely used in published studies (Mukumbang et al., 2019; Jackson and Kolla, 2012). These dyads and triads identify parts of the IACMO heuristic (appendices 3.6.3-1 and 3.6.3-2). The framework developed in phase two was used to organise and analyse data, which is an iterative process (figure 3.6.1). Following the data extraction and grouping into abstract categories, the aim was to identify potential contexts, mechanisms and outcomes and identify (where possible) potential dyads and triads used to develop causal explanations using the IACMO heuristic.

An example of dyads shows a link between context and outcome (C–O). The following quotation from the associate director (participant 23, p. 17) highlights that the micro-context (clinical autonomy PONs) appears to contribute to OTDSCs for clinical reasons. The quotation also suggests that the organisational context, which provides a 15-minute time slot to conduct a patient consultation, influences the clinical autonomy of PONs:

> *“There is way too much pressure for them [pre-operative nurses]. They work under very bad conditions and only have 15-minute clinic slots (meso-context) and no time to do their nursing job (macro-context). This is why surgery cancellations [OTDSCs] are high due to clinical reasons.”*

This example of dyads demonstrates a link between mechanism and outcome (M–O). The following quotation from an anaesthetist and clinical director (participant 2, p.

10) explains the connection between mechanism (i.e., compassion) and outcome (i.e., individualisation of care):

> *"It is the clinical skills and also the caring attitude [that] prevent things like surgery cancellations [OTDSC]… When staff understand the impact of their actions and care about patients (compassion- mechanism), they do everything they can to prevent things like delay discharges and surgery cancellations [OTDSCs]."*

As an example of a triad (CMOC), the following quotation from a surgeon (participant 21, p. 8) explains how the context and mechanism contributed to OTDSCs because of the patient being unfit for surgery:

> "*duty anaesthetists do not trust (mechanism) that all the individual clinical needs (context) like anaemia, hypertension, medication, pain or anticoagulants are not managed properly. That is why they get [the surgery] cancelled (outcome).*"

The coding aims to identify any fragments of information associated with the IACMO heuristic that influences OTDSCs. The transcript of a theatre improvement manager's interview (participant 4) is provided in appendix 3.6.3-4 to give an idea of how the coding was completed.

All the dyads and triads identified from the interview transcripts related to each IPT were captured to understand various patterns related to OTDSCs. In the next step, the most relevant dyads and triads to IPTs were organised using the conceptualised framework in flip charts. The flip chart approach provided many advantages, such as identifying gaps in each component related to the conceptualised framework and synthesis of models (figures 8.3-1 and 8.5-1). The flip chart approach helped to visualise and apply inductive and deductive reasoning and principles of retroduction into the analysis to identify various trends directly related to OTDSCs and IPTs, including behavioural mechanisms.

The analysis and identification of IACMO and synthesis was a multi-step, non-linear, iterative process. Analysis of a large amount of data using the retroductive approach recommended in realist studies, is challenging, time consuming and frustrating. However, it provided useful experience and skills for the purpose of this thesis and to conduct future analyses. The challenges of the analysis and lessons learnt from the iterative analysis are detailed in the reflection section under the discussion chapter (see section 8.9).

3.6.4 Phase four

Phase four consisted of five stages of realist synthesis(Pawson, 2006): defining the scope of the review, searching primary studies using keywords from each IPT, evidence appraisal, extracting data and synthesis. Chapter seven explains all five stages including data analysis.

3.6.5 Phase five

Phase five, the final phase of the study, aimed to answer the research questions in Chapter 1, using iterative analysis to combine the findings of all the preceding phases (two, three and four). Figure 1.4-1 illustrates the five-phase research process.

The unit of analysis of realist evaluation is PTs(Hunter et al., 2022). Iterative analysis therefore focuses on refining PTs, including validating, refining and refuting them. The analysis focused on identifying fragments of data from literature and different data collections and summarising them (refer to section 8.3). The data from three phases was organised using a coding framework. An example of how the coding framework was used to organise data fragments is explained in table 3.2-1. As with the data analysis in phase three, in addition to taking notes, flip charts were used to help organise, visualise and synthesise data and develop qualitative models. The data analysis was conducted between January and May 2022. The analysis was presented at the Organisational Behavioural Health Conference 2022 at the University of Birmingham, where valuable feedback was given to improve the analysis.

As with other phases, the iterative analysis used a framework and ICAMO heuristic tool to refine the PT. The iterative analysis further validates the ICAMOs presented in Chapters 5 and 6, indicating reasonable confidence in the synthesis, including the behavioural mechanisms. The summary of the analysis in phase five is highlighted in section 8.3.

Using all the evidence, phase five synthesised a PT that explains how to minimise OTDSCs and how interactions between standardisation and individualisation of care influenced unintended outcomes. Two qualitative models were developed based on the iterative analysis, which explained how to minimise OTDSCs (figure 8.3-1) and how interactions between standardisation and individualisation of care, including other components, minimised unintended outcomes (figure 8.5-1).

Data fragments (M–O dyads).	**Phase two**				**Phase three**	**Phase four**
	Literature (n=35)	**Feasibility study**	**Two feedback events with patient representatives (n=6)**	**Theorising with expert practitioners (n=8)**	**Semi-structured interviews (n=28)**	**Realist synthesis (n=20)**
Trust between clinicians and patients,(mechanism) and OTDSCs because of patient-initiated reasons (outcome)	Trust between HCPs and patients contributes to OTDSCs (Vaughn et al., 2017).	PONs play a vital role in preparing patients for surgery, including clinical and communication aspects, which can influence OTDSCs resulting from patient-	Individualised communication by PONs and the trust between the healthcare actors and patients or carers is arguably critical to a high-quality patient experience and minimising OTDSCs initiated by patients. Trust between patients and HCPs plays an important	PONs are predominantly involved in preparing patients for surgery and play a critical role in improving various aspects of individualisation of care, including gaining the	The CMOCs in Chapters 5 (sections 5.4.1 and 5.4.2) and 6 (sections 6.2.5 and 6.2.6) highlighted that patient individualisation of care concerning patient communication activates the trust mechanism among patients, which influences the	Trust and mistrust are important in patient–clinician interactions in the healthcare system (Viftrup et al., 2020; Denholm et al., 2020). Sometimes, patients' lack of trust in clinicians might create OTDSCs (Viftrup et al., 2020).

Data fragments (M–O dyads).	**Phase two**				**Phase three**	**Phase four**
	Literature (n=35)	**Feasibility study**	**Two feedback events with patient representatives (n=6)**	**Theorising with expert practitioners (n=8)**	**Semi-structured interviews (n=28)**	**Realist synthesis (n=20)**
		initiated reasons.	role in influencing OTDSCs, for reasons such as DNA and failure to provide consent to continue with surgery.	trust of patients, carers and family members by providing information and addressing issues.	decision to continue with surgery or instigate patient-initiated OTDSCs.	

Table 3.6-4 An example of the coding framework used to organise data fragments in phase five

The iterative analysis identified various interesting ideas and concepts, some of which will be discussed in future studies (refer to section 8.9). Phase five presents novel and transferable contributions to knowledge that can be used in a wide range of SSCSs to minimise OTDSCs for clinical reasons (refer to section 8.7). Using OTDSCs as a case study, the study concludes by developing a refined theory and making recommendations on managing the interplay between standardisation and individualisation of care to minimise unintended outcomes and improve quality in HDSs. Based on the findings and analysis, phase five identifies recommendations for minimising OTDSCs and unintended outcomes (section 9.4).

3.7 Ethics and confidentiality

As drawn from the declaration of Helsinki, researchers and HCPs are bound by ethical codes of conduct and are responsible for the well-being of research participants and patients' best interests at the forefront of research, overseen by various organisational and national research ethics committees (World Medical Association, 2001).

The University of Manchester ethics committee provided the ethics approval for the semi-structured interviews (Ref: 2724-4054). Health Research Authority (HRA) provided the ethics approval to complete the semi-structured interviews and handle patient level data (IRAS ID -277044). Participation was voluntary as the participants were all healthcare workers working to a high degree of independence. Interview data was handled as securely as possible using institutional guidelines by experienced administrative colleagues well informed in data confidentiality. After use to check for any inaccuracies or inconsistencies in the transcripts, the audio recordings were securely deleted. Following organisational guidelines, the data and identifiers were kept in password-protected computers. Theorising with expert practitioners and patient representatives was deemed unnecessary for formal ethics approval. However, the data collection and data management guaranteed participants' anonymity.

Ethical issues related to qualitative research, especially in the health services raises risks related to the well-being of participants, including anxiety and distress, anonymity, confidentiality, informed consent, researchers' potential impact on the participants, misrepresentation, and breaching confidentiality (Allmark et al., 2009; Richards and Schwartz, 2002). These were considered using the humanisation of healthcare framework for qualitative research, which emphasised potentially humanising and dehumanising components related to HDSs (Todres et al., 2009). The main ethical considerations related to the semi-structured interviews include informed consent from the participants, confidentiality or anonymity, and data storage.

All interviewees who participated in semi-structured interviews were emailed the pre-interview guide (appendix 3.6.3-1), information sheet (appendix 3.6.3-2) and an approved consent form before the interview (appendix 3.6.3-3). Each interview participant signed the consent form before starting the interview after being given the opportunity to ask any questions. In the case of telephone interviews, this form was emailed to the researcher before the interview. Ensuring anonymity and confidentiality was imperative to encourage participation, as OTDSCs are considered controversial and somewhat sensitive. The data handling, storage, and reporting of results were completed using institutional guidelines.

3.8 Conclusion to Chapter 3

As highlighted in section 2.5, OTDSCs are a complex problem, with causal links embedded deep in the agency and structures within SSCSs. Rather than ignoring the diverse interactions between structure and agency and the causal forces and circumstances affecting the various actors involved, realist methodology recognises and embraces dimensions of complexity and thus represents an appropriate approach to addressing the studying's research question. The study used retroductive reasoning, which plays a central role in realist methodology in uncovering why things are the way they are (Jagosh, 2020). Retroduction aims to

understand phenomena going back from, below or behind observed interactions and patterns to understand why OTDSCs are happening and how to minimise them. The research investigation used iterative analysis to develop IACMOCs to explain causal interactions. The research investigation is divided into five phases: the chapter outlined the methods used in each phase and how the data was analysed, while the final section discussed ethics and confidentiality. The next chapter discusses the findings of phase two, which aims to understand the scope of the study and develop IPTs.

4 Chapter – scoping, mapping and theory gleaning

4.1 Introduction

Chapter Four presents the development of IPTs related to OTDSCs. These were completed using evidence from multiple methods in phase two of the study. In the first instance, preliminary IPTs were identified by theory gleaning from carefully selected samples of OTDSC literature (n=35). Secondly, the identified preliminary IPTs were further refined using multiple methods: the findings of the feasibility study included eight NHS trusts, two feedback events with patient representatives (n=6), and theorising with eight expert practitioners (n=8). To provide further transparency and a systematic approach to developing IPTs, the methods used to develop IPTs were explained in the methodology chapter (i.e., three). This chapter ends with identifying four IPTs that, linked to different types of standardised interventions, explain most of the OTDSCs and defend the rationale for prioritisation of one IPT. In phases four and five, the prioritised IPTs were used to develop CMOCs from the literature and empirical data.

The subjective and atheoretical categorisation of OTDSCs by published articles and NHS trusts is a significant barrier to developing transferable theories and comparing the reasons for OTDSCs among organisations. To overcome this barrier, the chapter contributed to new knowledge by introducing a taxonomy of OTDSCs based on different aspects of individualisation and the actors who initiated them, including: by clinicians, due to an inadequate level of individualisation of care related to clinical care planning (e.g., failure to manage anticoagulation medication or hypertension, identify co-morbidities); by administrators, due to an inadequate level of individualisation of care concerning allocation and providing resources (e.g., unavailability of theatre time post-operative beds, professionals and equipment); and by patients (e.g., DNA or failure provide consents), due to an inadequate level of individualisation of care concerning patients communication.

When developing IPTs, the standardised interventions used in the SSCSs were conceptualised as complex social interventions influenced by multiple contexts, actors, and behaviours. The four identified IPTs linked to four different types of standardised interventions and OTDSCs initiated by three types of actors. The iterative analysis found that, when care is delivered using HCPs, the ability of standardised interventions to provide individualised care appears to provide the contexts to different OTDSCs initiated by various actors.

For example, IPT one explained that, when preparing patients for surgery by PONs, failure in standardised clinical care interventions (such as clinical protocols and clinical assessment tools) to achieve an adequate level of individualisation as expected by the clinical team performing the surgery can lead to OTDSCs initiated by the clinicians due to inadequate level of clinical preparation (i.e., patient unfit for surgery due to clinical reasons). IPT two explained that, when preparing patients for surgery by PONs, failure in standardised interventions related patient communication (such as follow-up interviews, protocol based interviews, use of pre-interview guide, communication checklist, and leaflets) to achieve an adequate level of individualisation of related patient communication can lead to OTDSCs initiated by the patients, such as a DNA or not providing consent on the day of the surgery.

Similarly, IPT three explained that a failure to allocate resources using standardised interventions (e.g., using a scheduling tool for bed allocation and theatre time) can lead to an inadequate level of individualisation of resource allocation initiated by administrators (e.g., bed managers and theatre matrons) responsible for resources. This can lead to OTDSCs due to a lack of resources (e.g., theatre time post-operative beds and equipment). IPT four explained that failure in various protection interventions (e.g., ring-fencing beds and dedicated emergency theatres) leads to the unavailability of resources, resulting in an inadequate level of individualisation of delivery of resources initiated by administrators (e.g., bed managers and theatre matrons) responsible for

resources. This therefore leads to OTDSCs due to a lack of resources (e.g., theatre time post-operative beds and equipment).

The iterative analysis found that OTDSCs are a complex unintended outcome with strong links to different types of contexts (macro and meso), influenced by many interconnected "variables" such as in macro (e.g., NHS waiting-list policy, austerity measures, and workforce shortages), meso (e.g., workload, high emergency admissions, and interruptions), standardised interventions, and behaviours of HCPs and patients. Due to the complex and interconnected nature of OTDSCs, it is hard to eliminate them without affecting patient safety, but they can be mostly minimised. Despite the complexity and context sensitivity of OTDSCs, their occurrence can be minimised by preparing patients for surgery while addressing their individualised needs.

Firstly, the chapter presented the "preliminary IPTs" developed from the OTDSC literature. Secondly, it summarised the following findings: the feasibility of the comparative study from NHS trusts (n=8), theorising with expert practitioners (n=8), and the two PPI group conducted with expert patient advisors. After considering all the evidence, the chapter developed a taxonomy of OTDSCs that linked various aspects of individualisation and different types of OTDSCs. The chapter concluded by explaining the key findings, the four IPTs and the rationale behind the prioritisation of IPT one, used to develop CMOCs in the later phases of the study.

Notes

The evidence-informed approach to theorising found that predominantly nurses deliver pre-operative care. However, the nurses who worked in pre-operative care were identified by various job titles, such as pre-assessment nurses, pre-operative care nurses, surgical nurses and day ward nurses. After consultation with expert practitioners, they were identified as PONs in the thesis to avoid confusion and create consistency.

4.2 Sub-phase one - theory gleaning

In total, 35 studies were identified to develop preliminary IPT, consisting of 24 descriptive and cohort studies, five literature-related studies and six interventional studies.

Table 4.2-1 summarises the data extraction from single-centre and cohort studies. Table 4.2-2 summarises the data extraction from literature-related studies. Table 4.2-3 summarises the data extraction from interventional studies. The descriptive and cohort studies were from the following countries: UK, Brazil, USA, Sweden, Tanzania, Hong Kong, Ireland, Spain, Lebanon, Finland, Singapore and Taiwan. The analysis suggests OTDSC literature is atheoretical, descriptive, and largely focused on the prevalence and their impact. Although OTDSCs were acknowledged as a system failure, little is known about the extent of the overall problem, how and why, including what conditions lead to or minimise OTDSCs (Al Talalwah and McIltrot, 2019). At the time of the literature search (i.e., March 2019), there were no systematic reviews, economic impact assessments, meta-analyses or realist reviews published related to OTDSCs. Furthermore, most of the studies are atheoretical and descriptive, with no theories related to OTDSCs, which made developing preliminary IPTs challenging.

The iterative analysis identified OTDSCs as a global and long-standing problem and provided compelling explanations of the negative impact on patients, healthcare organisations and professionals. OTDSCs create significantly high levels of waste in healthcare resources, increase waiting times, elevate suffering for patients and their carers, and sometimes harm patients (Al Talalwah and McIltrot, 2019).

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
(Argo et al., 2009)	Elective surgical case cancellation in the veterans health administration system: identifying areas for improvement	USA	Most of the cancellations are preventable by improving individualisation care. Interventions focusing on individualised patient contexts (e.g., lower socio-economic groups, such as the homeless and those with limited personal travel resources) in the serving population to improve communication and care planning are vital to reducing elective surgical case cancellations. The veterans' administrative system reported a 12.4% cancellation rate, and the estimated loss for the year was $32 million. Multiple interventions focusing on patient factors, facility factors and inadequate workup are needed to reduce overall elective surgical case cancellations.
(Basson et al., 2006)	Predicting patient non-appearance for surgery as a scheduling strategy to optimise operating space utilisation in a veterans' administrative hospital.	USA	Multivariate analysis found that patient DNA could be strongly predicted from patient non-compliance with clinic visits and other clinical procedures without reference to other variables assessed. Further analysis of data from an independent sample of patients confirmed this observation. Most of the cancellations are preventable by improving individualisation care related patient communication.

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
(Berger A.A. et al., 2017)	The impact of the Affordable Care Act on urogynecologic surgery CRs.	USA	The study concludes that the implementation of the Affordable Care Act did not affect Female Pelvic Medicine and Reconstructive Surgery surgical cancellations. The study reported various significant predictors such as day of the week (i.e., Friday), co-morbidities (i.e., renal and liver disease) and minor procedures. Patients undergoing major surgery recorded low cancellation rates and high adherence to care. OTDSCs is linked to various national and regional policies.
(Caesar et al., 2014)	Incidence and root causes of cancellations for elective orthopaedic procedures: a single-centre experience of 17,625 consecutive cases	Sweden	Of all 17,625 patients scheduled for elective surgery, 6,911 (39%) had their procedure cancelled at least once. Careful examination of individual patient needs and addressing them, active involvement and good patient care communication by PONs can reduce surgery cancellations.
(Chalya et al., 2011)	Incidence, causes and pattern of cancellation of elective surgical	Tanzania	The study highlighted that 3,064 patients were scheduled for planned surgical operations. Of these, 644 (21%) patients' operations were cancelled. The mean hospital stay was significantly related to the number of cancellations. Providing overtime payments to staff (meso-context) may offer some incentive to prevent

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
	operations in a university teaching hospital in the Lake Zone, Tanzania		cancellations. Failure of protection interventions – lack of dedicated theatres due to emergency surgeries – is a major problem for cancellations. Organisational contexts (meso-context), such as staff shortages and lack of resources (i.e., drugs and oxygen cylinders) have influenced OTDSCs.
(Chiu et al., 2012)	Cancellation of elective operations on the day of intended surgery in a Hong Kong hospital: Point prevalence and reasons	Hong Kong	Careful examination of individual patient needs and addressing them, active involvement and good patient care communication by PONs can significantly decrease the rate of same-day–intended surgery case cancellations and minimise OTDSCs. Most of the cancellations are preventable by improving various aspects of individualisation care.
(Cihoda et al., 2015)	The Analysis for the Causes of Surgical Cancellations in a Brazilian University Hospital	Brazil	Of the 29,518 planned surgeries, 16.1% were cancelled. The patient-related reason accounted for more than 40% of all cancellations. The study used standardisation approaches such as checklists to prevent clinical care planning problems. Effective nurse-patient communication gives the patient confidence and trust to undergo surgery. Using standardised interventions that improve individualised communication between the patient and the hospital is key to minimising surgery cancellations.

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
(Dalton et al., 2016)	Day of surgery admission in total joint Arthroplasty: why are surgeries cancelled? An analysis of 3195 planned procedures and 114 cancellations	Ireland	The main reasons for cancellation were the medical reason (i.e., 92), and 50% of these patients chronic medical condition is identified at the PAC. Patients with cardiorespiratory co-morbidities are at the greatest risk of cancellation. Disagreement between the PAC physicians and anaesthetists who review the patients is a major factor for OTDSCs. However, the PAC physicians' competency in addressing individual patients' clinical needs is vital to minimise OTDSCs. Most of the cancellations are preventable by improving individualisation care.
(Dimitriadis et al., 2013)	The challenge of cancellations on the day of surgery	UK	The study reported 5.19% for elective and planned emergency procedures during 2012. The authors reported that the hospital has good established pre-operative services but still has very high OTDSCs due to patients unfit for surgery. The inadequate preparation using standardised interventions for surgery and the opinion of on the day responsible anaesthetist can influence OTDSCs. Organisational contexts such as lack of resources such as beds and theatre time can influence OTDSCs. Most of the cancellations are preventable by individualised care related to improving clinical and communication.

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
(González-Arévalo et al., 2009)	Causes for cancellation of elective surgical procedures in a Spanish general hospital	Spain	Despite 92% patient underwent a pre-operative anaesthetic assessment, cancellation by broad category was for 'medical reasons' in 50%, 'patient-related factors' in 23%, and due to 'administrative/logistic problems' in 25%. Despite robust hospital protocols for the management problems such as anticoagulation, latex allergy, pre-operative fasting, difficult airway management, these issues collectively accounted for almost 30% of cancellations. Despite robust standardisation approaches (i.e., pre-operative anaesthetic assessment) that study recorded high surgery cancellations.
(Kaddoum et al., 2016)	Causes of cancellations on the day of surgery at a Tertiary Teaching Hospital	Lebanon	This study reported 4.4% (261/5929) OTDS CR and 71.6% were judged as potentially avoidable. Theatre efficiency depends on OTDSCs and the determining the major avoidable contributors to OTDSCs is an important first step to improving theatre efficiency.
(Laisi et al., 2013)	Surgery cancellation on the day of surgery in same-day admission in a Finnish hospital	Finland	The study reported 4.5% (551/12,205) over two years. The surgery cancellations reasons were divided into three categories: patient, hospital and staff. Individualisation of care related to clinical care planning and communication is vital to minimise OTDSCs.

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
(Leite et al., 2019a)	Reducing Preventable Surgical Cancellations: Improving the Pre-operative Anesthesia Interview Process	USA	After the intervention, the documentation of pre-operative anaesthesia interview records increased, whereas unnecessary pre-operative testing decreased, neither with no statistical significance. Avoidable cancellation rates decreased significantly from 34.3% to 20% (P < 0.5), contributing to a 3-month post -implementation cost savings of approximately $30,000. The use of standardised intervention to conduct pre-operative anaesthesia and online anaesthesia educational modules for nurses conducting pre-operative anaesthesia interviews increased pre-operative record completion rates, lowered unnecessary laboratory testing, and prevented surgical cancellations.
(Leslie et al., 2013a)	Day of surgery CRs in urology: identification of modifiable factors.	Canada	In the five-year data collection period, 1,544 of 19,141 (8.07%) elective surgical cases were cancelled within the three surgical specialities (general surgery, gynaecology and urology). Patient interviews (n=29) confirmed the emotional and financial impact of cancellation; there was no overwhelming concern that clinical outcomes were negatively affected. OTDS cancellation is a multi-factorial challenge and every cancellation should be considered as a failure of the health system. An

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
			incident analysis should be carried out to understand the causes behind cancellations.
(McIntosh et al., 2012)	Cancelled surgeries and payment by results in the English NHS	England	In 2007 alone, hospitals were reimbursed almost £70 million concerning the cancellation of operations. Longer patient waiting times and admission on a Monday were associated with higher rates of cancellations. Older patients, patients from lower socio-economic groups and male patients reported higher rates of cancelled procedures. Significant variation in surgery CRs existed between hospitals – foundation trusts and private facilities had the lowest CRs.
(McKendrick et al., 2014)	A five-year observational study of cancellations in the OT: Does the introduction of pre-operative preparation have an impact?	UK	A total of 28,928 cases were included in the study. The introduction of the clinic reduced the total number of cancellations from 9.7% to 8.6%. This study indicates that the introduction of pre-operative clinics for patients reduces OTDS cancellations. Most of the cancellations, especially due to clinical and communication problems are preventable by improving individualisation care.
(O'Dwyer et al., 2015)	Preventing `same-day' cancellations in elective urological	UK	During the study period, 9039 elective operations were reviewed to find 2804 cancellations and C.R.s vary respectively: 15.6%, 21.7% and 29.3% for inpatient, day case and procedure-room cases, respectively. Different interventions aimed at

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
	surgery: Are different strategies needed for inpatient, day case and procedural admissions?		different patient groups is required to reduce OTDS cancellations. It is vital to conduct incident analysis to understand surgery cancellations. Most of the surgery cancellations are preventable by improving individualisation care.
(Pang et al., 2019)	Surgery scheduling under case cancellation and surgery duration uncertainty.	China	Uncertainty surrounding surgery duration and patient cancellation in OR scheduling brings complex challenges. To address the challenge, the study developed and tested a three-stage stochastic programming model. The experiment used real data from two hospitals, while the model highlighted that the cost of OT could be reduced by 27%. The study suggested assigning designated OTs to departments with complicated surgeries to reduce overtime and the costs involved in patient waiting time.
(Pratap et al., 2015a)	Reducing OTDSCsat a children's hospital.	USA	Key drivers for intervention include effective communication between patients and their families and compliance with fasting rules and decision-making on patient illness before the day of surgery. Mean OT time lost as a result of OTDS cancellation decreased from 5.7 to 3.6 hours/day in testing with a sub-section of surgical services at one site, and then from 6.6 hours to 5.5 hours/day when implemented across all services at both surgical sites. Explicit and focused pre-

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
			operative instructions, text message reminders to carers and a clearly defined internal decision-making process on patient illness have reduced surgery cancellation. Multiple interventions that focused on improvements in care communication and planning have reduced OTDS cancellations. The project claims additional revenue for OT is alone is estimated at around $800,000 per year. Most of the cancellations are preventable by improving individualisation care.
(Santos and Bocchi, 2017)	Cancellation of elective surgeries in a Brazilian public hospital: reasons and estimated reduction	Brazil	Out of the 8,443 elective surgeries scheduled, 7,870 (93.21%) were performed, and 573 (6.79%) were cancelled. The study highlighted that although the hospital reported lower C.R.s than other studies, 80% of cancellations were avoidable. Variations of clinical opinions among professionals in the pre-operative care and on the day of the surgery has contributed to OTDSCs. Paediatric and elderly patient-reported a high number of surgery cancellations. There is no seasonality regarding the reasons for cancellations.
(Schuster et al., 2011c)	The effect of hospital size and surgical service on case cancellation in elective surgery: results from a	Germany	Surgery C.R.s varied among hospitals, from 0.8% to 17.9%, and among services – from 0% to 22.5%. Services in university hospitals had CRs 2.29 times higher than mid- to small-size community hospitals, suggesting that academic hospitals have a higher incidence rate of case cancellations than non-academic hospitals. General surgery services reported high rates of case cancellations. The same benchmark, based on C.R.s, should not be used for all types of hospitals.

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
	prospective multi-centre study		
(Seim et al., 2009)	OTDSCs at two major university hospitals	USA and Norway	Despite many differences, better communication between patients and the hospital can reduce various disruptions related to OT and cancellations. As a result of reporting and organisational contexts and changes in the healthcare systems involved, it is not easy to transfer findings.
(Sung et al., 2010)	Operation cancellation at Chang Gung Memorial Hospital	Taiwan	The study found the patient with high clinical complications is more likely to cancel. Forty-seven surgery cancellations were related to cardiovascular problems. Individualised communication with patients and relatives, identifying and treating relevant co-morbidities, and making adequate preparations for surgery can reduce OTDSCs.
(Tan et al., 2019)	Risk factors and reasons for cancellation within 24 hours of scheduled elective surgery in an academic medical	Singapore	A total of 4,060 elective surgeries were included in the study, of which 398 (9.8%) were cancelled within 24 hours of surgery. Multivariate analysis identified that patients with co-morbidities and low socio-economic status, and those exhibiting non-compliant behaviours were more likely to cancel or be cancelled. Surgeries conducted by senior physicians and for more complex conditions were less at risk of cancellation. Improved attendance at the PAC can reduce surgery cancellations. Most cancellations are preventable and reducing OTDSCs requires more in-depth analysis to identify treatable root causes and improve OTs.

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
	centre: a cohort study		
(Vaughn et al., 2017)	Putting a face and context on paediatric surgery cancellations: the development of parent personas to guide equitable surgical care.	USA	To reduce surgery cancellations, it is vital to understand and address various interpersonal, environmental, and cultural factors that influence patient factors in clinical care planning and communication. Patients undergoing surgery have diverse clinical and socioeconomic needs; therefore, the care needs of patients are individualised. Healthcare organisations need to move away from “one-size-fits-all” (i.e., standardised) interventions to address diverse patient needs in care planning and communication. Predominant themes include family support systems, building trust, access to transportation, flexibility in scheduling, previous experience in the hospital setting and trust in the medical system. Patient trust or distrust about the clinical team appears to influence the decision to continue with the surgery (i.e., OTDSCs due to patient initiated reasons). Sometimes, patients' or carers' trust depends on their experience; therefore, building trust plays an important role in minimising OTDSCs due to not turning up.
(Wong et al., 2018)	Cancelled operations: a seven-day cohort study of planned	UK	This UK-wide study found that 10% (1,499/14,936) of patients reported previous cancellations of the same procedure. 13.9% of patients attending for inpatient surgery had the surgery cancelled. Most OTDSCs, which include around one-third of OTDSCs, were due to clinical reasons.

Author and year	Title	Country	Patterns of OTDSCs that helped to develop IPTs
	adult inpatient surgery in 245		

Table 4.2-1 summary of the data extraction from single centre and cohort studies

Author and year	Title	Patterns of OTDSCs that helped to develop IPTs
(Al Talalwah and McIltrot, 2019)	Cancellation of surgeries: an integrative review	OTDSCs are a long-standing significant quality issue in healthcare systems worldwide, and rates can vary from 0.2% to 28%. Surgery cancellation is a multi-factorial problem linked to local contexts but largely preventable. OTDSCs were influenced by contexts such as poverty, limited access to care and language barriers, leading to communication difficulties. The review identified that care communication and planning could optimise pre-operative medical processes, playing a vital role in reducing OTDS CRs.

Author and year	Title	Patterns of OTDSCs that helped to develop IPTs
(Gillies et al., 2018)	Counting the cost of cancelled surgery: a system wide approach is needed	Argue that OTDSCs are a complex problem linked to various contextual factors inside and outside the hospitals (i.e., adequate social care resources). The article argues to understand the impact and minimise OTDSCs requires a system-wide approach and highlights the importance of focusing on clinical reasons linked to optimal preparing patients for surgery and accurate risk assessment.
(Macario, 2006a)	Are your hospital operating rooms "efficient"? A scoring system with eight performance indicators	The review identified case cancellation rates of less than 5% for a well-functioning OT This narrative review acknowledges the complex nature of OT efficiency and suggests using a series of metrics and benchmarks. The study introduces eight objective metrics with subjective benchmarks. Surgery cancellation is one of the metrics identified in the scoring system. The review highlights the importance of using a series of standardised interventions and "thoughtful planning ahead of time" in designed scheduled care pathways.

Author and year	Title	Patterns of OTDSCs that helped to develop IPTs
(Priebe, 2011)	Preoperative cardiac management of the patient for non-cardiac surgery: an individualized and evidence-based approach	It is vital to manage individual clinical risks before the surgery using evidence-based approaches to avoid complications during and after surgery, including surgery cancellations.
(Spahn and Priebe, 2004)	Preoperative hypertension: remain wary? `Yes' - cancel surgery? `No'	Hypertension affect around billion individuals worldwide. Often anaesthetist find the dilemma to cancel or not. When confronted with uncontrolled preoperative hypertension, anaesthetists must carefully consider several clinical conditions (medications, arterial pressure, clinical history) to understand the combination of individual risks related to surgery. Providing all the relevant information to the anaesthetist on the day of the surgery as part of the preoperative assessment might be helpful to minimise or make informed decisions related to OTDSCs due to clinical reasons.

Table 4.2-1 summary of the data extraction from literature related studies

Reference	(Barnes et al., 2000)
Title of study	**Influence of an anaesthetist on nurse-led, computer-based, pre-operative assessment**
How might and should the intervention work (i.e., applying "realist logic")	Following introduction of the intervention, the study reported a statistically significant reduction of OTDS CRs from 4.8% to 1.8% (p = 0.03), suggesting that CRs can be minimised through appropriate screening of patients using a computer-driven protocol and in conjunction with early intervention on the part of a senior anaesthetist. The standardised rule-based computer programme mandates nurse screening practices, which has helped to collect and organise a plethora of clinical information consistently and comprehensively, asking necessary questions, ordering necessary tests and creating a series of actions based on patients' clinical history, preparing patients for surgery. The standardised rule-based computer programme mandates that nurses should document consistently and comprehensively actions completed in patients' electronic care records for anaesthetists who assess the record on the day of admission to evaluate clinical readiness. The audits and assessments carried out as part of this evaluation confirm that rule-based computer programmes have managed to create comprehensive and consistent care records (intermediate outcomes) that enable understanding of what has been done to improve patients' clinical readiness for surgery (intermediate outcomes), minimising OTDSCs because patients are unfit for surgery. The study highlighted that optimum clinical readiness for surgery is an important factor but does not prevent OTDS cancellations. The study provides a fascinating example of how agency or perception differences on the part of anaesthetists result in OTDS cancellations. The study highlighted both the consistency and comprehensiveness (intermediate outcomes) of care plans as well as clinicians'

	perceptions of the clinical readiness (intermediate outcomes) of the patient as vital in minimising OTDS cancellations.
Reference	(Haufler and Harrington, 2011)
Title of study	**Using nurse-to-patient telephone calls to reduce OTDS cancellations**
How might and should the intervention work (i.e., applying "realist logic")	The intervention allows nurses to have real-time communication with patients undergoing surgery three days before the day of admission – a process designed to prevent OTDSC related to incidences where patients DNA, violations of NPO instructions and a lack of responsible adults present with the patient. The intervention also enables collection of new information from patients related to OTDSCs and passes this information to other actors using an algorithm to prevent OTDSC or reschedule surgery where necessary. The study also highlighted that both standardisation and personalised approaches play a vital role to minimise OTDSCs.
Reference	(Hovlid E, Bukve O, Haug K, Aslaksen AB, 2012)
Title of study	**A new pathway for elective surgery to reduce cancellation rates**
How might and should intervention work (i.e., applying "realist logic")	The intervention was arguably designed to prevent potential reasons for OTDSCs(e.g., incidences where patients DNA, patients unfit for surgery and unavailability of beds), introducing a variety of "mini-interventions" to prevent OTDSCs. For example, an early pre-operative assessment was introduced to reduce OTDSCs because of patients unfit for surgery. In increasing patient participation in scheduling, surgery was used to reduce incidences where patients DNA, with follow-up calls to check patients' clinical readiness and willingness for surgery, creating a central capacity co-ordinating role to mandate practice and potentially reducing resource-related OTDSCs.

	The study also highlighted that both standardisation and personalised approaches play a vital role in minimising different types of OTDSCs. In pre-operative care planning, emphasis is placed on improving patients' clinical readiness using several standardised "mini-interventions", which aim to improve clinical readiness (intermediate outcomes) for surgery by clearly mandating the roles of healthcare actors and the assessments they do, potentially leading to a reduction of OTDSCs because of patients unfit for surgery. Although some patient engagement "mini-interventions" take place and there is some acknowledgement of addressing patient needs (e.g., patient-centredness), the study did not record any interventions directly addressing patients' emotional and psychological needs. When healthcare actors mandate various actions to complete assessments and documentation in the pre-operative care stages, this can provide the opportunity (context) for patients to interact (e.g., ask questions and raise concerns) with healthcare actors, leading to "positive perceptions" ahead of turning up for surgery. Follow-up calls two days before surgery provided nurses with the opportunity to assess patients' clinical readiness for surgery (e.g., health conditions, emotional and logistical issues) and intervene and reschedule surgery where necessary, leading to prevention of OTDSCs for patient-initiated reasons and because patients are unfit for surgery. The study findings suggest that using a series of interventions focusing on minimising various reasons for OTDSC and creating favourable contexts resulted in sustainably low OTDS CRs.
Reference	(McKendrick et al., 2014)
Title of the study	**A five-year observational study of cancellations in the operating room: Does the introduction of pre-operative preparation have an impact?**

How might and should intervention work (i.e., applying "realist logic")	This study aimed to examine the impact of the roll out of a pre-operative preparation clinic on OTDSCs, particularly the effect of this clinic on reasons for OTDSCs, which were expected to be affected by pre-operative preparation. Two of three reasons (medical reasons and incidences where patients DNA) were expected to be affected by the introduction of the pre-operative preparation clinic and showed significant reduction. In contrast, patient self-cancellations on the day of surgery increased. The interventions deployed different degrees of resources for patients with different clinical needs/complications, introducing a triage process to achieve high clinical readiness for surgery and mandating healthcare actor practices using various standardised assessments. The pre-operative preparation clinic mainly focuses on clinical preparation of patients for surgery, offering an opportunity to improve patients' readiness to undergo surgery and placing little focus on addressing patients' emotional and psychological support. When healthcare actors have consultations and assessments, this enables patient interactions and allows patients to raise concerns if needed. The pre-operative preparation clinic provides resources to enable conversations related to "risk/benefit" and linked to patient consent to undergo surgery, providing a dedicated opportunity for patients to raise any concerns related to surgery and thus improving patient readiness for surgery. The intervention did not report any follow-up calls, suggesting that the interconnected series of interventions significantly influences the reduction of OTDSCs because of incidences where patients DNA and for medical reasons. As with most studies in surgical care, the underlying assumption is that continuously mandating healthcare actor practices leads to intended outcomes (e.g., high levels of

	comprehensiveness and consistency in patient clinical readiness, resulting in reduction of OTDSCs). The intervention highlights that the pre-operative assessment anaesthetist completes a generic assessment of the patient care plan. A different anaesthetist may assess the patient on the day of surgery, and different clinical opinions can lead to patient surgery being cancelled because patients are unfit for surgery. To minimise problems related to different opinions of risks, leading to surgery cancellation because patients are unfit for surgery, a feedback loop was created between the anaesthetist performing the pre-operative assessment and the anaesthetists completing the assessment. The nurses were fully supported with full anaesthetist support across all five days, leading to a high comprehensiveness level and consistency in patient clinical readiness, thus minimising OTDSCs. In addition, nurses with extensive surgical experience were recruited and anaesthetists provided full training, also influencing OTDSCs. Cancellation reasons such as interruption because of emergencies and lack of operating time were not expected to be affected by pre-operative preparations and did not show significant reductions, suggesting that other intervention types are needed to reduce OTDSCs for resource-related reasons. Over the five-year period (2006 to 2011), the bed numbers in the hospital decreased from 194 to 170, leading to a higher number of outliers because of various organisation policies. Similarly, various meso- and macro-effects influence bed unavailability, including infections in hospital wards, problems in other community hospitals and reduced medical discharges. This suggests that it is vital to protect scheduled care resources to prevent cancellations because of emergencies or other capacity-related influences on patient flow. However, the study also demonstrates that this can be challenging to achieve when hospitals have limited resources.

Reference	(Olson and Dhakal, 2015)
Title of study	**OTDS CRs after pre-operative nurse telephone screening or comprehensive optimisation visit**
How might and should the intervention work (i.e., applying "realist logic")	The interventions aimed to minimise OTDSCs because patients were unfit for surgery based on robust pre-operative assessment processes, which work for a patient population with low levels of clinical complications (context) who have ASA classifications of between 1 to 3. Standardising care tools can achieve high-level consistency and comprehensiveness (intermediate outcomes). Clinical readiness for surgery has led to a reduction in OTDSCs. Healthcare actors' attempts to clinically prepare patients have led to increased patient readiness, resulting in increased adherence to care (intermediate outcomes) and minimising OTDSCs for patient reasons.
Reference	(Turunen et al., 2018)
Title of study	**The impact of a structured pre-operative protocol on day of surgery cancellations**
How might and should the intervention work (i.e., applying "realist logic")	By using a series of "mini-standardised interventions" (e.g., outpatient assessment, triage process and pre-operative assessment) mandates what needs to be done by various actors their roles, practice and documentation to create "multi-professional cooperation". The "mini- standardised intervention" involves follow-up calls completed the day before admission, giving nurses the opportunity to check the patient's clinical readiness (i.e., by checking the patient's health situation) and willingness to turn up, taking any necessary action to reschedule the surgery to another date, therefore minimising OTDSC because of patients unfit for surgery or because of incidences where patients DNA the day before admission. The study defined OTDSC as any scheduled surgery on the day of the surgery (i.e., date of admission). In other words, cancellation is recorded as the day before cancellation (i.e., rescheduling), not as a OTDSC –

	this may have influenced the OTDS CRs because of patients unfit for surgery or incidences where patients DNA. As a result of continuously mandating roles, practice and documentation, it increases comprehensiveness, facilitating two ways to reduce OTDSCs: first, by improving the comprehensiveness and consistency of patients' clinical readiness for surgery and presenting evidence (results and tests) as part of the documentation – for example, by providing evidence that various diagnostic and other test results highlight patient clinical readiness and safety to operate. However, most patients undergo scheduled surgery with varying health conditions and do not have "normal" test results. Second, provision of consistent and comprehensive documentation can provide the opportunity to understand what clinical actions or tests are done to improve clinical readiness can prevent OTDSCs. For example, action is taken to improve anaemia and test result showing evidence of improvement. It is likely that the high compliance rate of the SPP in seven clinical specialities might have enabled this series of actions minimising OTDS CRs. A high case load per nurse (context) increases OTDS CRs and low clinical complications (context) reduce OTDS CRs. The study findings indicate that using a series of standardised and interconnected "mini-interventions" to mandate actions for healthcare actors can lead to reduced OTDSCs resulting from incidences where patients DNA. The study indicates that holistic patient assessment and patient education potentially leading to some level of individualised patient support. The individualisation of patient communication may lead to a "positive perception" (intermediate outcomes) among patients, creating the

	confidence and trust required for patients to undergo surgery or reducing anxiety associated with surgery (intermediate outcomes), The intervention was designed based on the “simple underlying assumption” that mandating what is expected from various healthcare actors’ roles, actions and documentation brings a high level of comprehensiveness and consistency, improving the clinical and patient readiness and minimising OTDSCs.

Table 4.2-3 summary of the data extraction from interventional studies

4.2.1 Links between the OTDSCs and standardised interventions.

The many descriptive studies highlighted that when using various standardised pre-operative interventions (i.e., checklists, protocols, scheduling tools) to prepare patients for surgery, the failure of HCPs to adequately address patient needs in pre-operative care before the day of surgery has led to OTDSCs (Dimitriadis et al., 2013; Dalton et al., 2016; Chiu et al., 2012). Furthermore, the US study (Leite et al., 2019a) found that strengthening pre-operative care using standardised intervention in pre-operative care and online anaesthesia educational modules for nurses conducting pre-operative care interviews increased pre-operative record completion rates, lowered unnecessary laboratory testing, and prevented surgical cancellations. Considering all the information, when pre-operative care is delivered, the failure of standardised interventions in clinical care planning, communication, protection and scheduling interventions to prepare patients for surgery contributed to different types of OTDSCs.

A large mixed-method study in the US found that clinically complicated patients suffering from co-morbidities are more likely to be cancelled on the day of surgery (Argo et al., 2009). A multivariant analysis completed in a tertiary hospital in Singapore found several co-morbidities in patients associated with OTDSCs: a history of cardiology complications, advanced chronic kidney disease and a history of hip fracture (Tan et al. 2019). Various descriptive prevalence studies have highlighted patients suffering from co-morbidities as more likely to be cancelled as a result of, for example, anaemia, respiratory problems, hypertension, cardiac problems and diabetes (Tan et al., 2019; Al Talalwah and McIltrot, 2019).

The review identified that patients from low-income groups with language barriers are more likely to report OTDSCs (Cookson et al., 2012). Two studies that performed a multivariant analysis in England and Singapore found that patients with low incomes (Tan et al. 2019) and low socio-economic backgrounds based on the "index of multiple deprivations" are associated with high OTDSCs (McIntosh et al., 2012). Despite the ominous nature of this finding, and the lack of explanation as to how and why these two trends operate in multiple healthcare settings and systems,

reasonable evidence suggests that patients with high clinical complications and low socio-economic status are at increased risk of OTDSCs. It is possible that patients with high clinical complications and low socio-economic status may have unmet patient needs when preparing for surgery.

The evidence review identified that patients with high clinical and socio-economic complications are more likely to report OTDSCs. A multivariant analysis completed in a tertiary hospital in Singapore found several co-morbidities in patients associated with OTDSCs: for example, history of cardiology complications, advanced chronic kidney disease and hip fracture (Tan et al. 2019). Various descriptive prevalence studies have highlighted patients suffering from co-morbidities as more likely to be cancelled as a result of, for example, anaemia, respiratory problems, hypertension, cardiac problems and diabetes (González-Arévalo et al., 2009; Kaddoum et al., 2016; Tan et al., 2019). The review identified that patients from low-income groups with language barriers are more likely to report OTDSCs (Al Talalwah and McIltrot, 2019). A Singapore study found that patients with low incomes are more likely to report OTDSCs (Tan et al. 2019). Despite the gloomy nature of this finding, reasonable evidence suggests that patients with high clinical complications and low social status are at increased risk of OTDSCSs. Patients from diverse backgrounds undergo surgery, it appears, and failure to identify and manage patients' individual clinical or communication needs by HCPs appears to contribute to most of the OTDSCs. For example, failure to prepare patients for surgery by identifying and managing their needs using standardised clinical care planning, communication, scheduling and protecting interventions led to different types of OTDSCs.

4.2.2 OTDSCs categorisation conundrum

Studies recorded various subjective reasons for OTDSCs (Argo et al., 2009; Dimitriadis, Iyer and Evgeniou, 2013; Leslie et al., 2013). Some studies have listed various reasons and used the phased "causes" interchangeably, creating confusion (Kaddoum et al. 2016; Seim et al. 2009; Chalya et al. 2011). As such, the categorisation (i.e., grouping) of reasons for OTDSCs varies based on the study in question: three (Schuster et al., 2011c; Chalya et al., 2011), six (Kaddoum et al.

2016) and seven (Seim et al. 2009). The categorisation of OTDSCs in the literature appear to be atheoretical and subjective, making it very difficult to compare and develop transferable theories to minimise OTDSCs.

After considering all the various reasons for OTDSCs in the literature, they can broadly be divided into three categories by who initiated them: clinicians, patients, and leaders/administrators. The OTDSCs initiated by patients include DNA, where the patient decided not to undergo surgery and failure to follow instructions. The OTDSCs initiated by clinicians (i.e., surgeons or anaesthetists) include patients being unfit for surgery, including a failure to adequately prepare patients due to infections or co-morbidities or failure to manage hypertension or anaemia. The OTDSCs initiated by healthcare leaders/administrators include a lack of physical resources (e.g., post-operative beds, theatre time and equipment) and professionals (e.g., surgeons and anaesthetists). Further details about these reasons for OTDSCS are discussed in the next section.

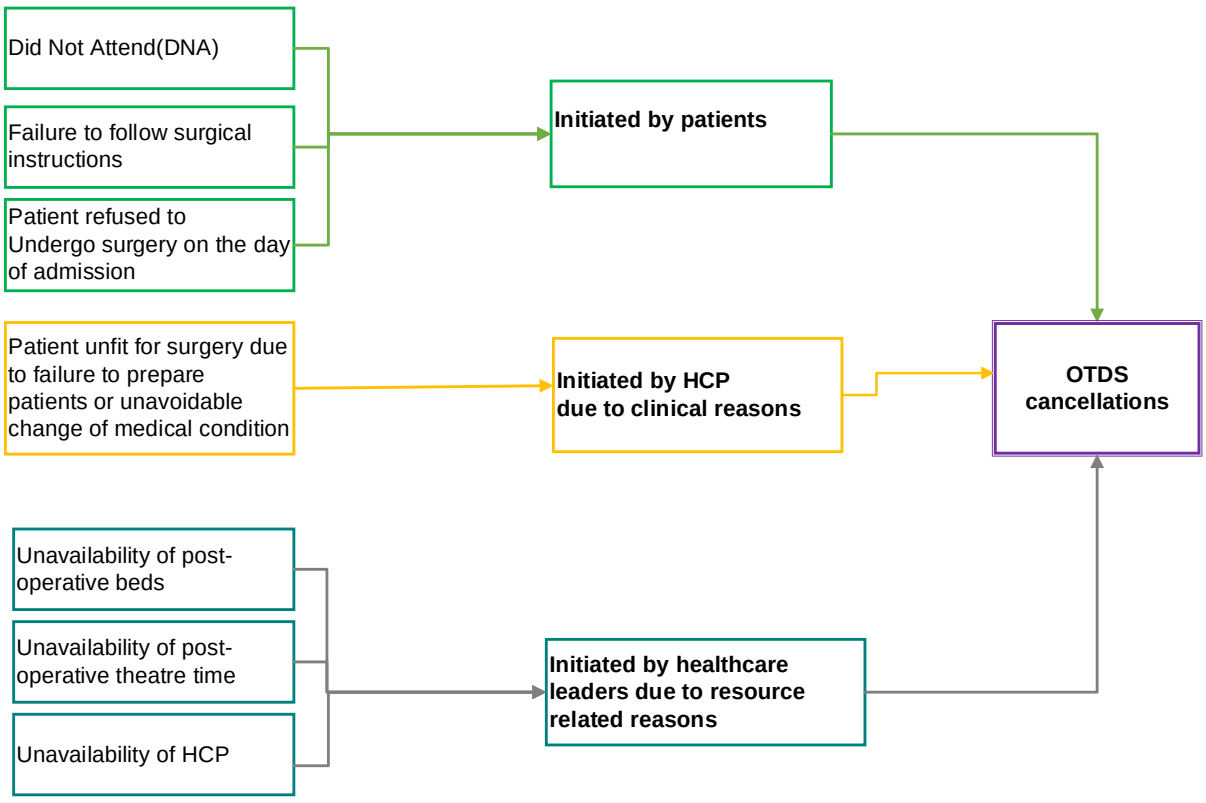


Figure 4.2-1 Categorisation of OTDSC based on who initiate

4.2.3 OTDSCs due to clinical reasons initiated by clinicians.

One of the most widely reported reasons for OTDSCs was patients being unfit for surgery, a decision that is initiated by clinicians to ensure patient safety or avoid potential risks. For example, a clinician may decide to cancel when the clinical team – mostly, consisting of surgeons and anaesthetists – believe that an inadequate level of clinical preparation could do potential harm to the patient. Multiple studies have reported high percentages of OTDSCRs resulting from patients being perceive as unfit for surgery; 32.6% (Kaddoum et al. 2016), 80% (Dalton et al. 2016), and 50% (González-Arévalo et al., 2009).

Pre-operative care planning helps identify clinical risks, prepare patients for surgery, and avoid potential risks and clinical complications in the intra-operative and post-operative stages of the surgery. A pre-operative care plan, therefore, has many vital roles, including identifying potential risks of surgery, rectifying these and completing necessary clinical tests. Failure to identify and manage potential risks can create various intra-and post-operative complications leading to OTDSCs because patients are unfit for surgery. Studies widely report that failure to identify and manage co-morbidities contributes to OTDSCs – such co-morbidities include chronic conditions, such as diabetes (Tan et al., 2019; Dalton et al., 2016), cardiac problems (Tan et al., 2019; Dalton et al., 2016), and hypertension (Tan et al., 2019; Laisi et al., 2013). Other studies have also highlighted failures to identify potential risks related to infections (O'Dwyer et al. 2015), allergies (Olson and Dhakal 2015; O'Dwyer et al. 2015; González-Arévalo et al. 2009), and coagulation medications (Dimitriadis et al., 2013; González-Arévalo et al., 2009), resulting in patients being unfit for surgery.

A UK study reveals an important insight, highlighting that clinically complicated patients (inpatients) are more likely to report OTDSCs because patients being unfit for surgery than patients with low clinical complications (day-case) (O'Dwyer et al. 2015). In several different countries and care settings, a series of pre-operative care planning standardisation interventions are used to reduce OTDSCs, such as explicit policies, protocols and checklists (Dalton et al., 2016; Hovlid et al., 2012b; Kaddoum

et al., 2016; Dhafar et al., 2015). Several single-centre studies have examined reasons for OTDSCs, identifying that absences and weaknesses in standardised interventions, such as lack of pre-operative guidance, protocols and checklists, and design shortcomings, influence OTDSCs, resulting in patients being unfit for surgery (Dalton et al. 2016; Kaddoum et al. 2016; Dhafar et al. 2015).

Various standardised care planning interventions (i.e., explicit policies, protocols, and checklists) were widely used to prepare all patients for surgery and minimise OTDSCs adequately. The analysis found that two types of actors' practices contributed to OTDSCs; the actors who prepare patients for surgery using various standardised care planning interventions (i.e., explicit policies, protocols, and checklists) and the actors who initiate OTDCSs. For example, PONs are mainly involved in preparing patients for surgery using clinical standardised care planning interventions. In contrast, declaring a patient unfit for surgery is initiated by anaesthetists and/or surgeons, responsible for safe delivery and aftercare of the surgery. The first preliminary IPT captured the following: the failure of standardised clinical care planning interventions linked with OTDSCs due to clinical reasons (i.e., the patient being unfit for surgery) was initiated by clinicians.

4.2.4 Patient initiated reasons

The patient-initiated reasons involved: DNA, the patient decided not to undergo surgery (i.e., failure to provide consent) and did not adhere to the pre-surgical instructions. However, among patient-initiated OTDSCs, DNA is one of the most widely reported reasons for surgery cancellations (Caesar et al., 2014; Dalton et al., 2016; Dimitriadis et al., 2013). Unlike when they visit outpatient clinics or a general practitioner, patients undergoing scheduled surgical care tend to go through comprehensive pre-operative care planning interventions and have opportunities to communicate with various healthcare professionals. However, almost all the quantitative descriptive studies reported OTDSCs because of incidences of DNA (Dimitriadis et al., 2013; Chalya et al., 2011; Laisi et al., 2013; Kaddoum et al., 2016). Several studies reported high percentages of OTDSCs resulting from incidences of DNA: 40% (Cihoda et al., 2015) and 50% (González-Arévalo et al., 2009).

A UK study exploring the OTDSCRs of urology patients highlighted that patients undergoing surgery with low clinical complications (e.g., day case and procedure room patients) are more likely to be cancelled for patient-initiated reasons such as DNA (O'Dwyer et al. 2015). For example, among 450 day-case patients, 52% of OTDSCs were associated with patient-initiated reasons, such as DNA, refusal of surgery and inconvenient appointment times. By contrast, of 580 inpatient cancellations, patient-initiated cancellation accounted for 10% (O'Dwyer et al. 2015). Another large cohort study completed in the UK highlighted that OTDSCs among inpatients reported DNA rates as low as 0.5%, suggesting that patients with high clinical complications are unlikely to experience DNA.

However, the prevalence of DNA-related OTDSCs suggested that hospitals in a wide variety of care settings fail to address their diverse communication needs during pre-operative care. Organisations use a wide range of standardised patient communication interventions to prepare patients for surgery, including follow-up calls, leaflets, and text reminders to attend surgery (Caesar et al., 2014). The second preliminary IPT found that various standardised care communication interventions (i.e., explicit policies related to communication, interview protocols, and leaflets) can be used to prepare all patients adequately for surgery and minimise OTDSCs due to patient-initiated reasons, such as DNA or the patient decided not to undergo surgery.

4.2.5 Initiated by leaders/administrators

When various leaders and administrators responsible for resources find they do not have the appropriate resources for a given patient’s needs to complete the surgery they initiate an OTDSC, principally due to the unavailability of post-operative beds, equipment, theatre times and professionals. OTDSCs because of post-operative bed unavailability were widely reported in many countries, including in Ireland (Coyle et al., 2012), Sweden (Caesar et al., 2014), Lebanon (Kaddoum et al., 2016), and the UK (Wong et al. 2018; Dimitriadis et al. 2013; O'Dwyer et al. 2015). Based on the clinical need of the patients undergoing surgery, different post-operative bed types are required, such as critical care, inpatient and day case beds. Furthermore, for

some patients, post-operative care based on the clinical speciality. For example, an inpatient undergoing general surgery needs to be admitted to a general surgery ward, while orthopaedic patients require different post-operative care in orthopaedic wards. It is, therefore, important to identify and allocate the appropriate type of post-operative care and facility (i.e., wards) based on patients' clinical needs in the pre-operative care stages using relevant standardised interventions before the patient is admitted to surgery (González-Arévalo et al., 2009).

Hospital resource management, especially in hospitals funded by taxpayers, is heavily influenced by various internal and external contexts. Most scheduled surgical care services share resources (e.g., post-operative beds, theatres, healthcare professionals and PICU) with emergency patients (Laisi et al., 2013; Wong et al., 2018; González-Arévalo et al., 2009). As a result, allocated resources for scheduled surgical care patients may be used to care for emergency care patients, resulting in OTDSCs because of the lack of post-operative beds. Overcrowding in A&E departments and delayed discharges were reported in many developed countries, including the UK, which has influenced OTDSCs due to resources (al Talalwah and McIltrot 2019).

Due to the nature of the scheduled care surgery, OTDSCs resulting from unavailability of resources can be divided into two categories: failure to allocate (i.e., scheduling) or allocated resources available to deliver resources on the day of the surgery. For example, failure to allocate the post-operative bed based on the patients' clinical needs can lead to unavailability of beds. However, having the right resources allocated to patients' clinical needs does not necessarily guarantee that HCPs will receive the resources on the day of the surgery, particularly in overburdened public hospitals. For example, allocated resource needs are prioritised for a variety of high clinical priorities, including scheduled care patients and emergency patients.

Various studies, especially in the UK, have highlighted various organisational contexts influenced by national policies that influenced OTDSCs due to resources. For example, insufficient bed capacity in the face of high demand disrupts the patient flow in hospitals and initiates OTDSCs due to a resultant unavailability of post-operative beds (Dimitriadis et al. 2013; Wong et al. 2018). A UK-wide cohort study reported 13.9% of OTDSCs among inpatients – 31% resulting from a lack of post-operative beds (Wong et al., 2018), suggesting that a lack of post-operative beds is a significant problem in UK healthcare systems. However, it is not clear whether OTDSCs occur due to failures to allocate resources based on patient needs or failure to deliver allocated post-operative beds on the day of the surgery.

The evidence from the UK suggests that reducing OTDSCs resulting from the lack of post-operative beds is a significant challenge, as allocating post-operative beds to patients undergoing surgery is dependent on various contexts outside the control of clinicians or hospital management (Gillies et al., 2018). To reduce OTDSCs resulting from a lack of beds, it is therefore important to allocate the right type of post-operative bed based on patient clinical needs and use appropriate protection approaches to avoid allocated resources being taken away from others in need, such as emergency patients (e.g., ring-fencing beds and dedicated scheduled care site). Studies recommended using both the scheduling (Laisi et al., 2013; González-Arévalo et al., 2009) and protection interventions (Dimitriadis et al. 2013) to decrease OTDSCs resulting from a lack of post-operative beds.

Another widely reported reason for OTDSCs initiated by leaders and administrators (i.e., theatre matrons and theatre managers) was the unavailability of theatre time (Chiu et al., 2012; González-Arévalo et al., 2009; Kaddoum et al., 2016). Some studies have reported high levels of OTDSCs resulting from a lack of theatre time: 65% (Chiu et al., 2012), 23% (González-Arévalo et al., 2009) and 17.3% (Dimitriadis et al., 2013). Among inpatients, Wong et al. (2018) highlighted that insufficient theatre capacity is the third most common reason for OTDSCs in the UK. OTDSCs resulting from lack of theatre time vary according to clinical speciality, and complicated cases from general surgery, urology and cardiothoracic surgery are

more likely than others to have insufficient operating theatre time for booked cases, even when scheduled early in the list (Chiu et al., 2012). Several studies have highlighted that overbooking of theatre lists has resulted in OTDSCs because of a lack of theatre time (O'Dwyer et al. 2015; Kaddoum et al. 2016; al Talalwah and McIltrot 2019) and noted the historic use of a data-driven approach to improve scheduling of theatre time (Chiu et al., 2012).

In some care settings where resources are shared with emergency patients, allocating accurate theatre time based on patient needs is vital to minimise OTDSCs but not enough its own. Like post-operative beds, allocated theatre time needs to be protected from other interruptions, such as patient flow issues as emergency patients and delayed discharges—failure to protect leads to OTDSCs.

Reducing OTDSCs resulting from lack of theatre time is a multi-faceted problem linked to the clinical complications of earlier patients in the surgical list, overbooking of theatre lists by surgeons, failures in care planning, and delays in starting OT (González-Arévalo et al., 2009; Chalya et al., 2011; Chiu et al., 2012). As with post-operative care beds, it is important to focus on scheduling the correct theatre time based on the patients' clinical needs and protect the theatre time allocated from various care delivery interruptions. Studies have recommended using standardised scheduling (Pang et al., 2019; Chiu et al., 2012) interventions to reduce OTDSCs resulting from lack of theatre time (Dimitriadis et al. 2013).

Most studies report a small number of OTDSCs resulting from the unavailability of HCPs, which is also initiated by administrators and leaders: 7 of 261 (Kaddoum et al., 2016), 16 of 644 (Chalya et al., 2011) and 43 of 551 (Laisi et al., 2013). Unavailability of surgeons, anaesthetists and occasionally nurses has been widely reported as a reason for OTDSCs (Laisi et al., 2013; Dimitriadis et al., 2013; Kaddoum et al., 2016). As many specialised HCPs, such as theatre practitioners, anaesthetists, surgeons and surgical and ward nurses, deliver care and are in constant demand, it is not unusual to find HCPs absent, late or reallocated to deal

with emergency patients. However, in the first instance, it is important to allocate appropriate HCPs based on patient clinical needs. For example, surgeons and anaesthetists require various specialist skills based on patient clinical needs. Hospitals need to consider scheduling HCPs based on clinical needs, as with other OTDSCs related to lack of resources (e.g., lack of theatre time and post-operative beds). Studies have recommended using a flexible approach to workforce planning to manage high variability and uncertainty by using overtime to reduce OTDSCs resulting from a lack of professional availability (Chalya et al., 2011).

The OTDSCs initiated by leaders and administrators appeared to influence the ability to allocate resources based on various patients' needs and deliver them on the day of the surgery. To accommodate both resource allocation and delivery, the study develops two "preliminary IPTs" related to resource unavailability. A "preliminary IPT" emerges that the failure of various standardised resource scheduling interventions' (i.e., scheduling tools, bed allocation protocols) failure to address patients' resources needs can lead to OTDSCs due to resource unavailability, such as inadequate theatre time and unavailability of post-operative beds and equipment.

Another "preliminary IPT" emerges that the failure of various standardised resource protection interventions' (i.e., ring fencing beds, dedicated emergency theatres) failure to address all patients' needs can lead to OTDSCs due to resource unavailability, such as theatre time and the unavailability of post-operative beds and equipment. However, in many cases, resources allocated to patients undergoing scheduled care surgery were reallocated to emergency patients instead due to reasons outside of an organisation’s control, such as the inability to discharge patients to community hospitals due to lack of social care or an influx of high-emergency admissions. Although resource allocation based on patient needs is within the organisations' control and is achievable, it is very challenging to prevent resource delivery OTDSCs because it is outside the control of the care provider or the hospital (Wong et al., 2018; Dimitriadis et al., 2013; Dalton et al., 2016).

4.3 Summary of findings in sub-phase two

4.3.1 A Global problem

The evidence from healthcare providers across the world highlights OTDSCs as a global and long-standing problem in both developed and developing countries. Even studies from organisations based in Europe and the US highlighted high OTDSC rates of around 10%, which appear to be widely reported undesired outcomes in SSCSs (Caesar et al., 2014) Cihoda et al., 2015). It may be unsafe to aim for zero OTDSCs. However, there is a consensus that OTDSCs are largely preventable (Sung et al., 2010; Kaddoum et al., 2016). The analysis identified OTDSCs as a complex undesired outcome and provided compelling explanations of the negative impact on patients, healthcare organisations and professionals.

4.3.2 Categorisation of OTDSCs

The identified studies reported a wide range of different types of reasons and categorisations related to OTDSCs. The iterative analysis found that all OTDSCs can be divided into three categories, mainly based on who initiated them: clinicians (e.g., unfit for surgery), patients (e.g., Did Not Attend or failed to provide consent) and leaders/administrators (e.g., unavailability of physical (post-operative beds or equipment) personal resources).

4.3.3 The tension between standardisation and individualisation of care

Four sub-systems of a standardised approach are design, terminological, performance, and procedural standards (Timmermans and Epstein, 2010). Among all of the sub-systems, hospitals rely on a wide variety of standardised interventions to deliver care in all the phases, suggesting that modern schedule surgical care systems epitomise all four sub-systems of a standardised approach. Patients with a wide variety of clinical and socio-economic needs undergo surgery worldwide. However, the underlying assumption of standardised interventions, essentially a "one-size-fits-all" approach, does not appear to be sufficient for all patients undergoing surgery. The descriptive studies suggested that SSCSs worldwide are highly standardised and appear to have relied on various standardised clinical care

planning, communication, and schedule interventions to prepare patients for surgery (Dalton et al., 2016; Dimitriadis et al., 2013; Al Talalwah and McIltrot, 2019).

The evidence from studies appears to indicate that the tension between standardisation and individualisation appears to lead to OTDSCs. For example, the analysis suggested that when delivering care using different standardised interventions (e.g., clinical protocol, interview guide and scheduling tools), failure to address individual patient needs, mitigate risks, and prepare patients for surgery all contribute to OTDSCs (González-Arévalo et al., 2009) (Tan et al., 2019). By contrast, when the same standardised interventions managed to identify and successfully manage patients' risks, OTDSCs were minimised (Leite et al., 2019b). Using standardised interventions – clinical care planning, communication and scheduling – preparing patients to achieve various aspects of individualised care is under the organisation's control, which can be challenging but achievable. However, minimising OTDSCs due to resource unavailability caused by various external factors and failure of the protection intervention can be challenging.

Different standardised interventions lead to different complications and appear to influence different interventions when delivering care. For example, failures in standardised clinical care planning interventions (e.g., checklist, protocols, and pre-assessment tools) lead to OTDSCs initiated by the clinicians due to unfit surgery. The complications include failure to identify co-morbidities, infections, or cardiac conditions (Dalton et al., 2016; González-Arévalo et al., 2009). Similarly, studies suggested that communication complications or failure of patient involvement led to OTDSCs due to patient-initiated reasons, such as DNA or the patient refusing to undergo surgery (O'Dwyer et al. 2015). Some studies highlighted that standardised interventions (e.g., based on the standardised estimated time for operation) managed to minimise OTDSCs.

Although SSCSs used a wide variety of standardised interventions, it appears to suggest that an inadequate level of individualisation of care provides the context to

various OTDSCs. When patients' individualised clinical needs are unmet, that leads to OTDSCs due to clinical reasons. Similarly, when patients' individual communication needs were not addressed, that leads to patient-initiated OTDSCs, such as DNA and patients refusing consent.

4.3.4 The link between various organisational, social-economic contexts and OTDSCs

Various studies highlighted that national policy and contexts outside hospital control contribute to an increase in the numbers of OTDSCs. The UK has fewer critical care beds per capita than many other high- and middle-income countries (Rhodes et al. 2012; Adhikari et al. 2010), which may contribute to a higher number of OTDSCs due to lack of critical care beds (Wong et al., 2018). Furthermore, NHS policy to reduce acute care bed numbers in hospitals and provision of inadequate social care has significantly pressured hospital patient flow, making this (i.e., OTDSCs) a health system-wide problem (Gillies et al., 2018). The analysis also identified that standardised interventions used to prepare patients for pre-operative care were influenced by various national (e.g., waiting times, adequate social care and national hospital bed policy) and organisational contexts (e.g., staff shortages and lack of post-operative beds, high emergency admission), which influenced OTDSCs (Caesar et al., 2014; Chalya et al., 2011; Seim et al., 2009)

4.4 Development of preliminary IPTs

Based on the literature review, the following preliminary IPTs were developed related to all types of OTDSCs (see table 4.4-1). Due to the lack of theory and the rather descriptive nature of the OTDSC literature, the study tried to capture various themes linked to OTDSCs, such as standardised interventions and various organisational contexts and actors initiating OTDSCs. The analysis identifies four main pathways contributing to all the OTDSCs reflected in the preliminary IPTs 1, 2, 3, and 4. OTDSCs initiated by clinicians due to clinical reasons, initiated by patients and unavailability of resources have a direct link to pre-operative care standardised interventions used to prepare patients for surgery as reflected by preliminary IPT 1, 2, and 3. The preliminary IPT 4 suggested the failure of various protection

interventions – ring-fencing beds and dedicated theatres – contribute to OTDSCs due to the unavailability of resources. The preliminary IPT 5 reflects various unfavourable organisational contexts that influenced OTDSCs. In the next stage of the theory refinement, the preliminary IPTs were refined into IPTs using evidence derived from multiple methods.

IPT No	Title	Preliminary IPT
i.	Related to OTDSCs due to patient unfit for surgery	Standardised clinical care planning interventions (i.e., checklist, clinical protocols, pre-assessment tool) failure to address all patients' clinical risks lead to OTDSCs due to patients unfit for surgery (i.e., failure to stop anticoagulation medication or identified co-morbidities or complete blood tests) initiated by clinicians who review the patients on the day of the surgery.
ii.	Related to OTDSCs due to DNA or refusal to undergo surgery	Standardised communication care interventions (i.e., text -follow up, interview protocols, communication checklists, follow-up calls) failure to address all patients' communication needs and concerns leads to OTDSCs initiated by patients, such as DNA and failure to provide consent to undergo surgery by the patients.
iii.	Related to OTDSCs due to resource unavailability - scheduling	Standardised resource scheduling interventions (i.e., scheduling tools based on historic theatre time) failure to schedule resources by addressing all patients' resource needs can lead to OTDSCs due to resource unavailability, such as theatre time and unavailability of post-operative beds and equipment.
iv	Related to OTDSCs due to resource	Standardised resource protection interventions (i.e., dedicated emergency theatres, ring-fencing beds) failure to protect resources from other high clinical priority patients

IPT No	Title	Preliminary IPT
	unavailability - care delivery	can lead to OTDSCs due to resource unavailability, such as theatre time and unavailability of post-operative beds and equipment.
v	Unfavourable organisation contexts	Unfavourable organisation contexts such as high workload of nurses, unavailability of resources and high emergency admission appear to increase all types of OTDSCs.

Table 4.4-1- explains preliminary IPTs that influenced OTDSCs from the literature

4.5 Sub-phase two: The findings of the feasibility study

Summary of the findings of the feasibility studies completed with 8 NHS trusts is explained below:

- Almost all the NHS trusts who participated in the feasibility studies reported that OTDSCs are a major challenge and they were struggling to minimise OTDSCs at the time of the data collection (i.e., 2018/2019). Most trusts participating in the feasibility highlighted that their OTDSC rates are around 10% to 15%. The high level of OTDSC rates appears to affect the efficiency of theatres and create significant problems for HCPs and patients.
- The NHS trusts categorised OTDSCs in an atheoretical and subjective way. Consequently, this led to a wide variation in reporting OTDSCs reasons among NHS trusts. The number of reasons given by trusts for OTDSCs varies from 18 to 76. For example, some NHS trusts used recorded reasons for OTDSCs, such as "surgeon cancelled" or "anaesthetist cancelled". By contrast, others focused on an overview of underlying reasons (i.e., lack of theatre time or unavailability of beds). However, some NHS trusts recorded OTDSCs using specific details of the type of beds or professionals that leads to OTDSCs, such as the lack of post-operative day case beds or post-operative high-dependency care beds (i.e., critical care level 2 beds) or unavailability of anaesthetists.

- Due to the subjective categorisation of OTDSCs and various limitations of information systems, comparing OTDSCs can present a significant challenge among different NHS trusts.
- OTDSCs appeared to be closely connected with NHS policy (e.g., austerity measures, national waiting list targets, inadequate social care level), organisational contexts (e.g., workforce shortages, inadequate level of post-operative beds), HCPs and patient behaviours.
- To enable the development of transferable theories and to avoid confusion in OTDSC reason categorisation found in sub-phase one (literature review), the OTDSCs were categorised based on initiators: by clinicians due to clinical reasons (e.g., failure to manage anti-coagulation medication or hypertension, identify co-morbidities), by administrators due to a lack of resources (e.g., theatre time post-operative beds, professionals and equipment), and by patients due to DNA or failure to provide consent. Figure 4.5-1 depicts how various reasons for OTDSCs identified in the NHS trusts applied to the three categories based on who initiated the cancellation.

For a completed record, please see Appendix 4.4, the reasons for OTDSCs in the eight NHS trusts. Appendix 4.4 explains the reasons for OTDSCs in the eight NHS trusts.

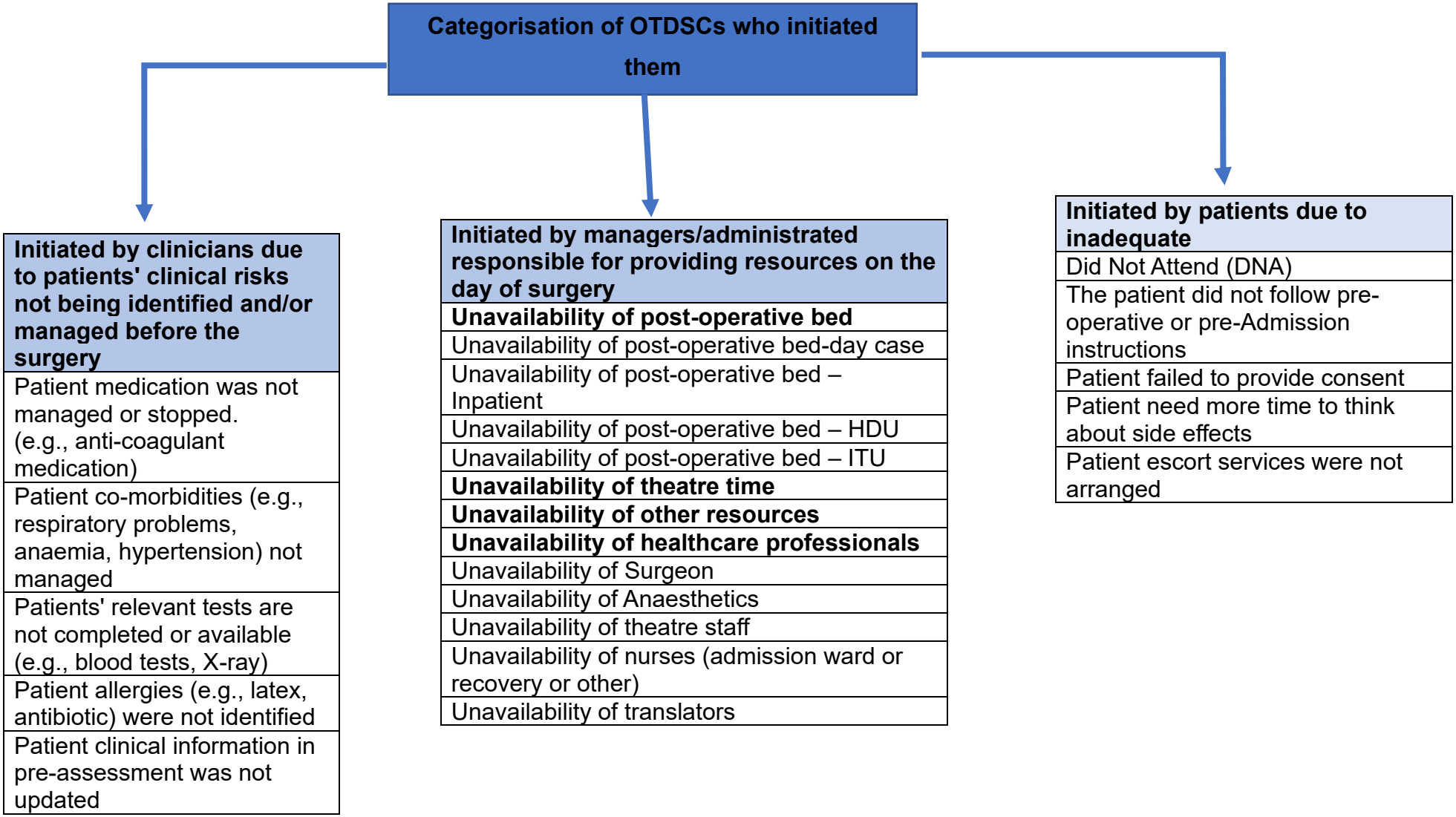


Figure 4.5-1 how various reasons for OTDSCs identified in the NHS trusts applied to the three categories based on who initiated them

4.6 Sub-phase two : summary of the findings of the feedback events with patient representatives

The summary of the findings from the feedback events with patient representatives is as follows:

- Undergoing surgery in an NHS care setting is a "highly technical" and "daunting" clinical environment where most patients were anxious about their treatments. Some patient experts referred to it as a factory-like system that aims to achieve various waiting list targets in the NHS.
- PONs used lots of leaflets, booklets and signposting tools and interview protocols and guides to provide care for patients, which suggested that PON practices are highly standardised and use of such tools is encouraged and relied upon as a standard.
- Individualisation of patient communication can minimise OTDSCs due to patient-related reasons (DNA and patient withdrawal of consent for the treatments at the last moment, or patient failure to follow instructions).
- PON behaviours and practices play a critical role of preparing various aspects of preparing patients for surgery, such as clinical care planning, communication, and scheduling. Failure to prepare patients for surgery can lead to OTDSCs. PONs “caring behaviour", "thoughtful clinical decision making", and "caring culture" is vital to minimise OTDSCs and improve patient experience.
- Individualised communication by PONs and the trust between the healthcare actors and patients or carers appear to be critical to a high-quality patient experience and minimising OTDSCs initiated by patients.
- In NHS hospitals, little emotional support is provided to patients undergoing surgery. PONs appear to be very busy due to their high workload and lack of time to engage personally with patients. On some occasions, the patient experts felt that PONs are under significant pressure due to heavily burdensome workloads and interruptions caused by emergency pressures. Most patient experts highlighted that pre-operative care clinic times were rushed and limited to 10 or 15 minutes. On some occasions, PONs directly told patients that the time they could provide was limited in the clinics.

- Most patients claimed that hospital disruptions (i.e., shortages of HCPs and emergency interruptions) due to NHS policies influence PONs. Consequently, it impacts the care provided, which leads to OTDSCs.

Appendix 3.6.2 provides an image of the flip chart diagram summarising the findings of the feedback.

4.7 Sub-phase two: Theorising with expert practitioners

The following information was identified in the theorising exercises completed with expert practitioners:

- OTDSCs were very common in the NHS and present a complex undesired outcome, which HCPs are well aware of and are concerned by the suffering and waste it creates. Breaking the news of OTDSCs is a challenging and emotionally draining process for even very experienced HCPs.
- There is clear evidence that surgical care systems in the NHS are heavily standardised with performance targets (e.g., 18 weeks, 62-day cancer target, two-week wait, and OTDSC CRs), standardised interventions (care planning protocol, checklist, scheduling tools, and anaesthetists protocols) and terminology (diagnosis codes and treatment codes). The SSSCs rely on a high level of standardisation, especially standardised interventions, to improve quality and minimise OTDSCs.
- Some HCPs criticised that SSSCs in the NHS rely too much on standard protocols and checklists, arguably limiting their clinical autonomy.
- When delivering care, the tension between the inability of standardised interventions to address individualisation of care can result in various quality problems, such as OTDSCs, theatre delays and delayed discharges.
- Sometimes, OTDSCs were necessary to avoid intra-operative and post-operative complications related to patient harm or safety issues. For example, when patients are not clinically suitable due to anticoagulation medication stopping, the clinicians responsible for surgery decide to cancel them on-the-day of the surgery to avoid any harm or patient safety issues (e.g., excess

bleeding and recovery issues). However, most OTDSCs can be minimised by addressing pertinent issues and risks.

- When the hospitals do not have specific resources (e.g., critical care beds, surgeons or anaesthetists with specialist skills) to undergo surgery, administrators/managers initiate OTDSCs due to resources to avoid potential patient harm. For example, OTDSCs due to post-operative beds being decided on the view that, there may be no suitable post-operative beds for patients at the point they are ready to leave theatre.
- OTDSCs caused by resource prioritisation, due to high emergency admission and patient flow problems, are very difficult to minimise without changing national NHS policy and providing social care.
- During the data collection period, there were significant pressures to deliver scheduled surgical care due to cost reductions caused by austerity measures, acute care bed shortages, and emergency department overcrowding. This interrupted and negatively impacted pre-operative care, as well as PON and HCP behaviours. Consequently, these myriad pressures contributed to increased OTDSCs.
- The national drivers and policies have created unfavourable working conditions (meso-contexts) for HCPs, such as very high workloads and negative disruptions due to patient flow and emergency care problems. High levels of stress and burnout among healthcare actors (PONs, anaesthetists, and surgeons) are common in the NHS, affecting both OTDSCs and the clinical autonomy of HCPs.
- Although OTDSCs are initiated by different actors, PONs are predominantly involved in preparing patients for surgery and play a critical role in improving various aspects of individualisation of care. PONs clinical skills", and "competency and confidence in clinical decision-making" is critical to minimise OTSDSCs.
- "Caring behaviour", “thoughtful clinical decision making” and good listening skills of HCPs were mentioned by practitioners as important behaviours that could minimise OTDSCs. Some practitioners mentioned patient trust in the clinical team as playing a vital role in minimising OTDSCs as a result of DNA or withdrawn consent. It is important to have sufficient autonomy of PONs to

enabled the good behaviours (“caring behaviours” and “empathy”) that minimised OTDSCs.

- Identifying and addressing various aspects of individualisation of patient needs, such as communication, clinical care planning and scheduling, can minimise a large amount of OTDSCs. For example, clinicians initiate OTDSCs due to inadequate levels of individualisation of care related to clinical care planning (e.g., failure to manage anticoagulation medication or hypertension, or to identify co-morbidities). Similarly, administrators initiate OTDSCs due to an inadequate level of individualisation of care concerning allocation and providing resources (e.g., unavailability of theatre time post-operative beds, professionals, and equipment). By contrast, patients (e.g., DNA or failure provide consents) undergoing surgery initiate OTDSCs due to an inadequate level of individualisation of care concerning patient communication.

4.8 Sub-phase three - Summary of the Findings of the iterative analysis

Considering all the information, the iterative analysis focused on identifying how and what contexts lead to OTDSCs.

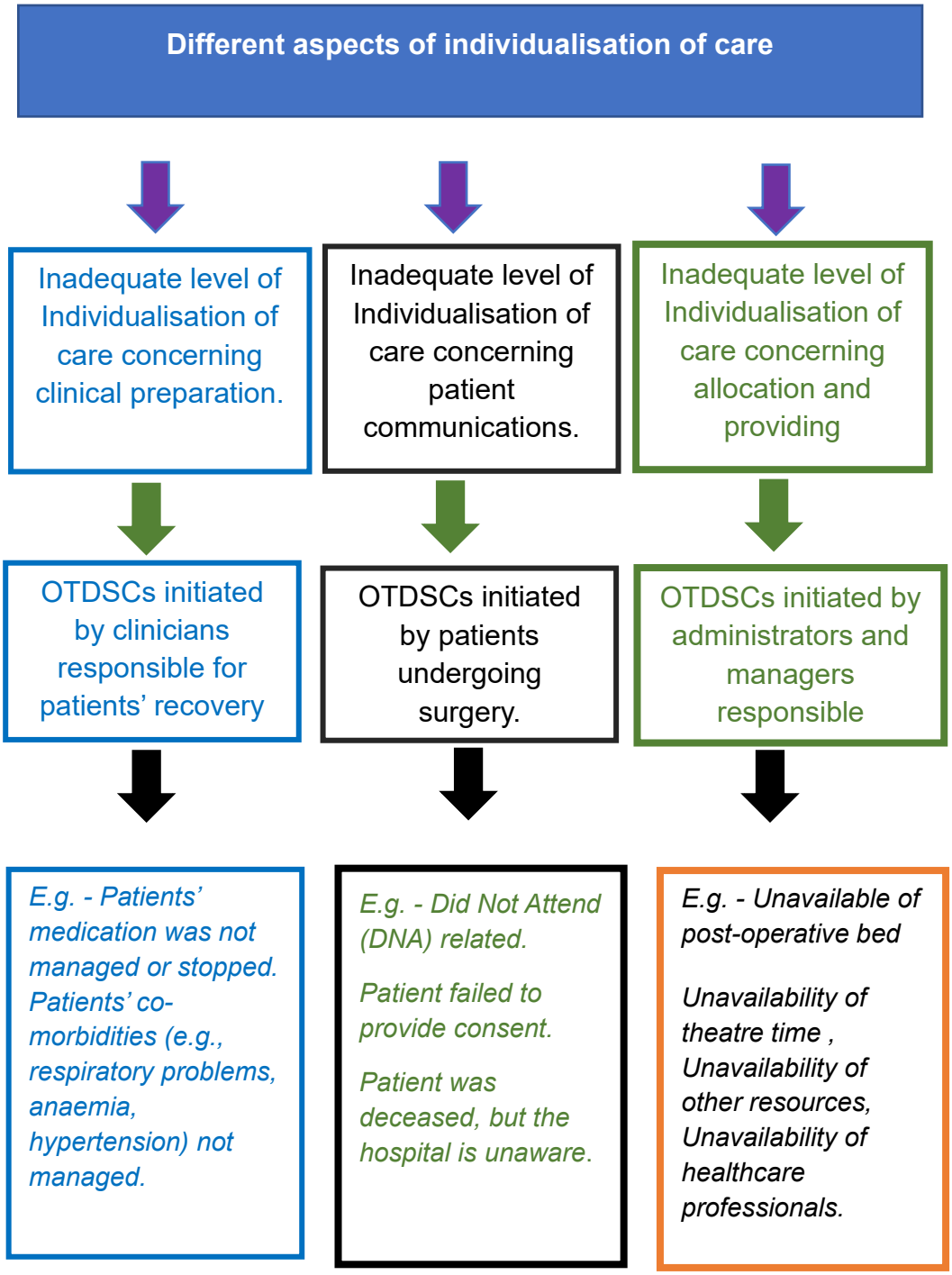


Figure 4.8-1 Taxonomy related to various reasons for OTDSCs and why different actors initiate OTDSCs

4.8.1 Different types of individualisations of care and Taxonomy of OTDSCs

SSCSs use different types of standardised interventions in preparing patients for surgery such as for clinical care planning, communication and resource allocation (i.e., scheduling). Failure to identify and address individual patient needs by the PONs in clinical care planning, communication, and scheduling can lead to different types of OTDSCs (section 4.2.2). For example, standardised clinical care planning interventions (pre-operative clinical protocols, checklists and tools) were used to improve the individualisation of care concerning clinical preparation. Inadequate level of individualisation of care concerning the clinical preparation of the patient undergoing surgery can lead to OTDSCs initiated by clinicians for clinical reasons (e.g., failure to manage clinical risks such as co-morbidities -cardiac, respiratory, hypertension or medication, such as anti-coagulant) or identify allergies. For example, when individualised communication needs are unmet, patients initiate OTDSCs such as DNA or withdraw consent. Similarly, when hospitals do not have specific resources (e.g., theatre time post-operative beds, professionals, and equipment) based on the patient's individual needs to complete the surgery, the administrators/managers initiate OTDSCs.

So far, the studies and organisations have used subjective and atheoretical approaches to categorise OTDSCs, creating significant barriers to developing transferable theories and comparing OTDSC percentages with other organisations. Based on the actors who initiate OTDSCs and, various aspects of individualisation of care can also be used to develop a taxonomy for OTDSCs reasons. Using multiple evidence, Figure 4.8-1 is a simplified version of the categorisation or taxonomy of OTDSCs.

4.8.2 NHS Policy and organisational contexts influenced the standardised interventions

NHS policy (i.e., austerity measures and workforce shortages) and unfavourable working conditions in NHS hospitals (i.e., acute care bed shortages and interruptions due to high emergency admission) have influenced standardised interventions, leading to OTDSCs. One key example is that resources allocated to scheduled

surgical care patients are routinely given over to emergency patients, due to inadequate social care and high emergency pressures. Another example, which may appear to be indirect and less visible, is the emergency pressures and overcrowding of wards (i.e., patients in ambulances and corridors), creating disruptions to the clinical work of PONs and other HCPs in SSCSs as they must turn their attention to emergency patients or become involved in resolving issues related to patient flow. On some occasions, the expert practitioners highlighted that pre-operative care areas and day wards are used to provide care to emergency patients who do not have ward beds. Consequently, it negatively influences clinical autonomy and HCPs are limited in their ability to provide high-quality care and limit OTDSCs.

4.8.3 OTDSCs undesired outcome in SSCS but can be preventable

The standardised interventions used in the SSCSs are designed to achieve the intended outcomes: completed surgery. By contrast, these standardised interventions' failure to adequately identify and manage various patient needs before the patient is admitted to surgery likely contributes to OTDSCs. For example, failure of standardised clinical care planning interventions to identify and manage various patient needs inadequately can lead to OTDSCs due to patients being clinically unsuitable for surgery. Another example is that the failure of the standardised scheduling interventions to address patient needs adequately can lead to OTDSCs due to the unavailability of resources. However, successfully completing standardised interventions to adequately address individualised clinical needs can lead to the intended outcome of the system, which is continued or complete surgery on the day of surgery.

4.8.4 The behaviour of PONs and patients

Although several actors (administrative and support staff, PONs, surgeons, anaesthetist, different types of nurses) are involved in care delivery, PONs play a vital role in preparing and minimising OTDSCs. When using clinical care planning interventions (i.e., clinical protocols, checklist), the PON's ability to make confident decisions can minimise OTDSCs due to patients being clinically unsuitable for surgery. However, various organisational contexts (e.g., acute care bed shortages

and interruptions due to high emergency admissions, lack of time in clinical consultations) appear to create challenging working conditions for PONs and constrain their ability to make such decisions.

When using protocol having “wider awareness” of patients and clinical history by PONs can be helpful to minimised OTDSCs. Trust between the PONs and patient undergoing surgery and carers is critical to minimise OTDSCs caused by DNA, and patient withdrawal of consent for treatments at the last moment. ‘caring behaviour’, ‘thoughtful clinical decision making’ and good listening skills of HCPs are mentioned by practitioners as important behaviours that could minimise OTDSCs. In contrast, the lack of ‘caring behaviours’ of HCPs, ‘freedom to make good clinical decisions’ and ‘caring cultures’ due to various organisational contexts appear to be linked to increasing OTDSCs.

4.8.5 The tension between standardisation interventions and individualisation of care

When PONs deliver care using standardised interventions to prepare patients for surgery (i.e., pre-operative care), failure to provide different aspects of individualised care appears to contribute to various OTDSCs. In other words, in some contexts, the tension between standardisation and individualisation of care appears to contribute to different OTDSCs. In contrast, when standardisation interventions used in pre-operative care aimed to address patients' various individual needs, this can prevent a large number of OTDSCs.

In the NHS, patients with a wide range of clinical and socio-economic needs undergo scheduled care surgery. However, the underlying assumption of standardised interventions (i.e., "one-size-fits-all") may not work for all patients. In some contexts, the failure of standardised interventions to address patients' individualised needs appears to contribute to OTDSCs. Furthermore, when using standardised interventions to prepare patients for surgery, the findings indicate PONs are expected to manage the interplay between standardisation and individualisation of

care. The iterative analysis found that PONs and other HCPs are under significant pressure to perform their clinical responsibilities due to various NHS policy and organisation contexts (e.g., staff shortages, lack of post-operative beds, high emergency admission). As a result, they have limited ability to manage the interplay between the standardisation and individualisation of care, which appears to influence OTDSCs.

The iterative analysis identified various undesired outcomes, such as delays in starting theatres and delayed discharges, that are linked to the failure to address patient needs. For example, when using standardised scheduling or clinical planning interventions, failure to understand and address some clinical risks means the clinical team requires additional resources or a consultation with the patients or other specialist clinicians, which can cause delays in starting surgery. To operationalise the research questions, after carefully considering the findings of the iterative analysis, I have categorised these into three types of OTDSCs. (see table 4.8-1).

OTDSC category	Underlying Reason	Associated interventions	Critical Behaviours of the healthcare actors	Macro and meso contexts
Patients not clinically suitable for surgery (i.e., patients unfit for surgery)	Patients undergoing surgery are not clinically prepared based on their individual clinical risk and needs before they admitted to surgery. Failure to identify various existing conditions (e.g., anaemia or cardiac conditions) and manage them leads to patients unfit for surgery.	Standardised clinical care planning interventions (i.e., checklist, clinical protocols, pre-assessment tool).	Maintained clinical autonomy, PON clinical skills, competency and confidence in clinical decision-making.	Various national policies related to "austerity measures" and "failure to workforce planning" have created unfavourable contexts in NHS hospitals such as high workload and burnt out among PONs, and negative disruptions due to patient flow and emergency care problems.
Patients decided not to undergo surgery by not attending (i.e., DNA) or withdrawing consent	Communication breakdown between the PON's and patient undergoing surgery. Failure to address various cultural, healthcare literacy and patient anxiety related	Standardised communication interventions (i.e., interview protocol, standard leaflets, follow-up calls).	PON's ability to be caring and thoughtful with patients undergoing surgery, patients undergoing surgery trust the clinical team	

OTDSC category	Underlying Reason	Associated interventions	Critical Behaviours of the healthcare actors	Macro and meso contexts
	to surgery. Patient failed to trust the clinical team.			
Unavailability of resources (e.g., post-operative beds, theatre time, unavailability of healthcare professionals)	Failure to allocate resources in advance based on patients' clinical needs. All the relevant patients' clinical conditions are not taken to allocate post-operative bed or theatre time).	Standardised scheduling interventions (i.e., scheduling tools based on historic theatre time, post-operative bed allocations).	PON's ability to understand patient clinical needs and allocated resources.	
	Failure to deliver resources based on patients' clinical needs.	Resource separation intervention (ring-fencing, dedicating emergency theatres).	Leaders/managers' ability to provide resources to complete the surgery.	Various national policies (e.g., acute care bed reduction, high emergency demand and lack of social care) have led to resource unavailability for patient undergoing scheduled surgical care.

Table 4.8-1 Based on the iterative analysis, how and what contexts likely influenced OTDSCs

Title of the IPT	Overview IPT
IPT one - Related to OTDSCs due to patient unfit for surgery	When care is delivered using standardised clinical care planning interventions (i.e., checklist, clinical protocols, pre-assessment tool) to prepare patients for surgery, the ability of PONs (actor) to make confident decisions is negatively influenced by various unfavourable working conditions (meso-contexts). As a result, inadequate level of individualisation of care concerning clinical preparation (outcome) leads to OTDSCs, due to patients being unfit for surgery (main outcome), initiated by the clinicians who review the patients on the day of the surgery. Unfavourable organisational conditions involved a lack of time to complete the clinical consultation, high-level of interruptions to clinical work due to emergencies, high workload, and inadequate staffing.
IPT two - Related to OTDSCs due to DNA or refusal to undergo surgery	When care is delivered using standardised communication interventions (i.e., pre-interview protocols, text, communication checklists, and follow-up calls), various unfavourable working conditions (meso-contexts) negatively influence the ability of PONs (actor) to communicate with patients. As a result, this leads to an inadequate level of individualisation of care concerning patient communication(outcome), resulting in a lack of trust among patients about the clinical team, leading to OTDSCs being initiated by patients, such as DNA and withdrawing consent (main outcome). Unfavourable organisational conditions (meso-contexts) involved a lack of time to complete the clinical consultation, high interruptions to clinical work due to emergencies, a high workload, and inadequate staffing.
IPT three - Related to OTDSCs due to resource	When care is delivered using standardised scheduling interventions (i.e., scheduling tools based on historic theatre time), various unfavourable working conditions negatively influence the ability of PONs (actor) to make confident decisions. As a result, inadequate levels of individualisation of care concerning allocation based on clinical needs leads to OTDSCs by administrators responsible for

unavailability -scheduling	providing resources (managers responsible for various types of post-operative beds, staffing or equipment) due to resource unavailability (main outcome). Unfavourable organisational conditions involved a lack of inter and intra-professional collaboration, high workload, and inadequate staffing.
IPT four - Related to OTDSCs due to resource unavailability - delivery care	When care is delivered using standardised protection interventions (i.e., dedicated emergency theatres and dedicated wards or sites for scheduled surgical care), the ability of HCPs and administrators (actor) to deliver resources by addressing individual patients' clinical needs (outcomes) is negatively influenced by various unfavourable working conditions. As a result, an inadequate level of individualisation of care concerning providing resources based on patients' clinical needs can lead to OTDSCs initiated by administrators responsible for providing resources (managers responsible for various types of post-operative beds, staffing or equipment) due to resource unavailability (main outcome). Unfavourable organisational conditions (meso-contexts) involved a lack of inter- and intra-professional collaboration, high workload, and inadequate staffing.

Table 4.8-2 Development of IPTs from multiple evidence

4.9 Development of IPTs

Considering all the evidence, the analysis refined the "preliminary IPTs" identified from the literature into four IPTs (i.e., main pathways) contributing to three types of OTDSCs initiated by three actors (table 4.8-2). The four potential pathways to OTDSCs are directly linked to standardised interventions, which are also influenced by various unfavourable organisational contexts, such as inter- and intra-professional collaboration, high workload, and inadequate staffing. In summary, IPTs explained four potential transferable pathways and explained how four different types of standardised interventions working with different actors and contexts contributed to different types of OTDSCs.

IPT one, two, and three are linked to standardised interventions to prepare for surgery by PONs while recognising the interplay between standardisation and individualisation of care and its influence on OTDSCs. Failure of standardised clinical care planning interventions to achieve individualisation of clinical care planning can lead to OTDSCs due to patients being clinically unsuitable for surgery. The fourth IPT focused on interventions protecting resources allocated to scheduled surgical care patients from being diverted to emergency care patients, such as dedicated emergency theatres and ring-fenced beds. The main actors related to the fourth IPT are various HCPs and administrators involved in managing patient flow of scheduled care and emergency care such as matrons, clinical leaders, flow managers, and bed managers.

4.10 Prioritisation of IPTs

The analysis identified four IPTs that reflect the four pathways likely to explain all the reasons for OTDSCs. Unpacking the IPTs and understanding how and why, and what conditions contribute to OTDSCs requires maximal effort, resources and time. However, it is not feasible to explore all the IPTs due to limited resources and time. Furthermore, a realist methodology approach encourages the prioritisation of IPTs (Shearn et al., 2017; Flynn et al., 2020), providing the opportunity to better understand how and why these IPTs works.

When it comes to minimising OTDSCs, the theorising with expert practitioners suggested that IPT one reacted to clinical care planning interventions that were more useful to clinical leaders and hospital administrators compared to IPT three and four, as it related to OTDSCs based on resource unavailability. For example, OTDSCs due to the unavailability of resources explained by IPT four, which is directly linked to high admission of emergency care, overcrowding and delayed discharges, appears to be influenced by NHS policy related primary care, bed management and inadequate levels of social care. During the data collection period in 2018/19, NHS hospitals faced significant urgent and social care pressures (Sheard and Peacock, 2019). Expert practitioners and patient representatives explained that NHS hospitals, were reporting significant patient flow problems. Therefore, hospital administrators and clinical leads had to prioritise various patients admitted to emergency care over scheduled care patients. The expert practitioners and patients argue that OTDSCs, due to resource prioritisation, which appeared to be linked to IPT four, are directly connected to the high emergency admission and inadequate social care sources. Similarly, unpredictable occurrences such as major accidents and flu outbreaks can lead to OTDSCs, due to the unavailability of resources, with those resources diverted in response to the arising emergency. Such incidents are outside the control of hospitals, however, the hospital has to respond to them by prioritising emergency care patients. Therefore, they argue that the study should consider IPT four a low priority because the findings of IPT four may have very little benefit to hospital administrators and clinicians.

The expert practitioners argued that despite much media and political interest about OTDSCs due to post-operative beds, most of OTDSCs (i.e., the patients being clinically unfit for surgery) in the NHS appeared to be linked with failure of the standardised clinical care planning interventions. Several studies published in the UK also suggested that most OTDSCs are linked to the failure of standardised clinical care planning interventions to prepare patients for surgery (i.e., operative care) (McKendrick et al., 2014; Dimitriadis et al., 2013). Most of the literature in Europe and North America suggested that the most common OTDSCs are patients being unfit for surgery due to clinical reasons (McKendrick et al., 2014; Dimitriadis et al.,

2013; Wong et al., 2018; Argo et al., 2009; Seim et al., 2009), which favours the prioritisation of IPT one.

Most of the expert practitioners highlighted the patient communication-related OTDSCs, but DNA and patients refusing to provide consent appear to be rare compared to OTDSCs related to clinical unfitness or resource unavailability in NHS hospitals. Studies in the UK found a very small percentage of patients had OTDSCs due to patient reasons (Wong et al., 2018; Dimitriadis et al., 2013). Therefore, it is unlikely that exploring IPT two, which focuses on patient-initiated reasons for OTDSCs, will be helpful to HCPs and administrators in the NHS.

Several expert practitioners argued that IPT one has a high degree of control among administrators, clinical leaders, HCPs and local policymakers compared to IPTs three and four, enabling the hospital to use the findings and make improvements to minimise OTDSCs. Some expert practitioners argued failure in clinical care planning could affect resource allocation and delivery, so it is important to prioritise IPT one over others. For example, failure to identify clinical needs can result in allocating the wrong resources, such as post-operative beds, equipment and theatre time. After considering all the aspects carefully, it was decided to prioritise IPT one because a greater understanding of IPT one will likely have a high impact on improving patient care by hospital administrators, clinical leaders, clinical leaders, and local policymakers.

4.11 Summary of the chapter

The iterative analysis identified OTDSCs as a long-standing and complex global problem. Despite the huge waste and suffering it brings to patients and carers, the literature related to OTDSCs was atheoretical and descriptive. Despite the importance, at the time of completion of phase two, no systematic review, realist review, meta-analysis or economic impact analysis had been completed in relation to OTDSCs. In 2020, a meta-analysis of the prevalence of OTDSCs was published

(Abate et al., 2020). Therefore, little was known about OTDSCs, how and why they happened, and what contexts contributed to them.

The analysis using multiple evidence found a series of interconnected variables: lack of inter and intra-professional collaboration, high workload, inadequate staffing, standardised interventions, various aspects of individualisation of care related to (i.e., clinical care planning, communication and resource allocations), HCPs and patient perceptions and behaviours. Due to the complex and interconnected nature of the OTDSCs, it is hard to avoid them without compromising patient safety, but they can be mostly minimised.

All OTDSCs can be divided into three main categories: initiated by clinicians due to clinical reasons; initiated by administrators due to lack of resources, and initiated by patients, such as DNA or failure provide consents. The iterative analysis found even the various actors initiate different types of OTDSCs; the PONs practice plays an influential role in preparing patients for surgery, including achieving various aspects of individualisation of care to minimise OTDSCs.

The iterative analysis of patient representatives and practitioners suggested the following behaviours: ‘caring cultures’, ‘caring behaviours’, and ‘confident decision’ making of PONs – are vital to achieving various aspects of individualisation of care. However, at this stage of the study it is not clear what these terms mean. Patient representatives and expert practitioners suggested that patient trust in HCPs and the clinical team appeared to be vital to minimise OTDSCs, such as in the case of DNAs. There appears to be a link that various unfavourable organisational contexts, including a lack of time to complete the clinical consultation, high-level interruptions to clinical work due to emergencies, high workload, and inadequate staffing, negatively influence PON behaviours, consequently contributing to OTDSCs.

The iterative analysis also highlighted that the tension between the standardisation and individualisation of care appears to create various quality problems (i.e., theatre delays, poor theatre utilisation, and delayed discharges), including OTDSCs. Despite a significant emphasis on standardisation of care in SSCSs, failure to have individualisations of care of patients undergoing surgery appears to provide a condition to OTDSCs. Various aspects of inadequate individualisation of care appears to link to various types of OTDSCs. For example, standardised clinical care interventions can lead to failure in the individualisation of clinical care. Consequently, this leads to OTDSCs initiated by the clinicians due to a lack of clinical preparation or patient unfit for surgery. Similarly, failure to allocate resources using standardised clinical care interventions can lead to an inadequate level of individualisation of resource allocation initiated by administrators (e.g., bed managers, theatre matrons) responsible for resources, and can lead to OTDSCs due to a lack of resources (e.g., theatre time post-operative beds and equipment). OTDSCs, where resource prioritisation due to influence from emergency patients on the day of surgery, were hard to minimise as they largely depend on a macro context of HDS and outside the control of the hospital.

Four IPTs linked to four types of standardised interventions were identified. These explained three types of OTDSCs initiated by three actors. However, the thesis prioritised IPT one to be further refined and validated in the next phases. IPT one was prioritised based on three rationales. Firstly, recommendation based on a greater understanding of clinical care planning is easily implemented within the organisational context among clinical leaders and hospital administrators and is most likely to improve patient care. Furthermore, clinical care planning standardised interventions which are linked to IPT one, appeared to be fundamental to minimising resource-related OTDSCs. Finally, OTDSCs due to clinical reasons linked IPT one, appeared to be one of the biggest reasons for OTDSCs. In the next chapter, realist synthesis-prioritised IPTs were used to develop CMOCs using the literature. Similarly, chapters six and seven develop CMOCs using empirical data from semi-structured interviews completed using the "teacher-learner" method.

5 Refining Programme Theory and CMOCs

5.1 Chapter introduction

In this and the next chapter, the IPTs are further refined using 28 semi-structured interviews conducted using the “teacher and learner” approach based on a purposeful sample consisting of a wide range of healthcare workers: surgeons, commissioners, anaesthetists, theatre matrons, different types of nurses and operational and senior leaders.

Chapters five and six present evidence to validate various elements related to IPTs, especially focused on IPT one. However, the evidence is closely linked and difficult to separate interconnected causal links into clear themes because of the interconnected nature and the “ripple effects” that run between macro, meso, and micro levels. Putting all the evidence in one chapter can make the chapter very big and challenging to read. The evidence is divided into two chapters to make it easier for the reader. Chapter five provides overall themes related to IPTs and how they are linked to OTDSCs. Chapter five critically engaged with concepts of standardisation and individualisation of care by highlighting how various contexts create OTDSCs. Based on the foundation build-up in chapter five, chapter six provides more specific evidence related to behavioural mechanisms and CMOCs.

In chapter five, the following themes were presented, which directly related to the research question and prioritised IPT: the nature of the OTDSCs (5.2), how standardised interventions influence OTDSCs (5.3), the role of standardisation and individualisation of care (5.4), different aspects of individualisation of care influenced different types of OTDSCs (5.5), the tension between the standardisation and individualisation of care (5.6), the impact of austerity measures and unfavourable organisational context on clinical autonomy and individualisation of care (5.7) and chapter summary (5.8). Chapter five identified two CMOCs, which explained how trust among HCPs and patients influenced DNA, the patient refusing to provide consent and requests to delay surgery on the day of admission.

Notes – terminology related to standardised clinical care planning interventions

The IPTs underpinned different types of standardisation interventions used to prepare patients for surgery and deliver care for surgical patients (section 4.4). The IPT one and refined programme theory underpinned the standardised clinical care planning interventions (section 4.10). In NHS, different trusts and actors use different local terminology to explain standardised clinical care planning interventions such as pre-operative clinical tools, standard toolkits, checklists, pre-assessment protocols, decision tools, algorithms, and clinical planning tools. Therefore, the term standardised clinical care planning interventions is used to avoid unnecessary confusion among readers in the whole thesis including IPT and PT. The contents and scope of these standardised clinical care planning interventions (pre-operative clinical tools, standard toolkits, checklists, protocols, decision tools, algorithms, and clinical planning tools) might differ slightly from one term to another. Still, they are used for the same purpose: to identify and minimise various individual clinical risks and emotional needs and prepare patients for surgery (section 2.3).

5.2 OTDSCs – a complex and common but mostly preventable problem

This section briefly introduces the complex and interconnected nature of OTDSCs, focusing on those resulting from clinical reasons. The interview participants acknowledged that OTDSCs are a complex and challenging problem in the NHS, leading to significant patient suffering and a waste of resources. However, they argued that they are mostly preventable.

The Head of Operations argued that OTDSCs are a significant problem in most NHS hospitals. Furthermore, based on their statistics, the Head of Operations highlighted that around one in ten patients reported OTDSCs, mostly for clinical reasons but with some resulting from the unavailability of post-operative beds. The Head of Operations pointed out that it is challenging to minimise OTDSCs because they tend to occur as a result of events that happen outside theatre areas (e.g. in pre-assessment clinics and wards).

"Surgery cancellations [OTDSCs] are a massive problem in every NHS hospital. Based on our trust figures, we cancelled [OTDSC] around one in ten patients booked for surgery, which is extremely costly. Mostly due to clinical reasons and some are due to beds…The problem is most of the surgery cancellations happened [because of] things outside the theatres."

(Participant 1, Head of Operations, p. 10).

A theatre improvement manager highlighted that OTDSCs are a complex problem linked directly to NHS policies such as austerity measures and other organisational problems, pointing out that it is challenging to minimise OTDSCs and takes longer for interventions to provide results. Despite this complexity, the manager argued that OTDSCs are generally preventable, with a specific focus on OTDSCs for clinical reasons.

"On the day surgery cancellation is a very hard problem to resolve in the NHS. I think it [OTDSCs] takes a long time to get good results due to various complexities around surgical care and due to austerity measures and problems in the NHS (macro-context). Most of the on the day surgery cancellations [OTDSCs] are preventable especially [for] clinical reasons."

(Participant 4, Theatre Improvement Manager, p. 21)

A chief executive also suggested that OTDSCs are a complex and dynamic problem related to patient behaviours and problems with wider NHS policy, such as failure to provide sufficient acute care and social care beds, arguing that various policy (macro-context) and organisational contexts tend to negatively affect front-line nurses' and doctors' decision making, making it hard to prevent OTDSCs. The chief executive suggested a link between clinical decisions, NHS policies, patient behaviours and OTDSCs.

"Surgery cancellation [OTDSCs] is a very difficult problem even to understand clearly…it [OTDSC] is a very complex and messy problem that is directly related to DH [Department of Health] failures to fund sufficient acute care beds, staff shortages and social care services (NHS policies – macro-context) and patient behaviours…the way to prevent them is to have good clinical decision

making but the problem is all these bad things [lack of resources, staff shortages] that are happening negatively affect the front-line nurses and doctors' clinical decision-making ability."

(Participant 5, Chief Executive, p. 13)

A matron emphasised that most OTDSCs are preventable, except OTDSCs resulting from emergencies (i.e., where emergency admission patients are given priority and provided resources from scheduled care patients) are preventable. The matron's comments justify the prioritisation of IPT 1 instead of IPT 4 (refer to section 4.9). The matron challenges the idea that OTDCSs are a theatre problem, arguing that OTDSCs have happened in theatre areas or close by, but the real reason for them lies with bad decision making in other areas. Furthermore, the matron highlighted that PONs who prepare patients for surgery or emergency bed managers who take decisions about prioritisation of resources can influence OTDSCs while theatre staff cannot do much to prevent them on the day of the surgery.

"Most [OTDSCs] cancellations except [those] due to emergencies can be easily preventable. Most managers think surgery cancellations [OTDSCs] are a theatre problem. If you look at them carefully, most of them happened due to bad decision making in other clinical areas…most of the time pre-op [PONs] nurses or emergency bed managers made bad decisions, it affects surgery cancellations [OTDSCs], most of the time, we cannot do much about them on the day of surgery."

(Participant 18, Matron, p. 12)

The surgeon's comments emphasised that most of the OTDSCs can be preventable by addressing the wide range of patients' clinical needs. Failures in pre-operative care or preparing patients can result in OTDSCs. The surgeon therefore argues that PONs' decision making can prevent OTDSCs by improving the individualisation of care of the patients undergoing surgery. In other words, surgeons' comments make the link between standardised interventions, individualisation of care concerning the clinical preparation of patients undergoing surgery and OTDSCs. Furthermore, PONs are identified as influential actors able to minimise OTDSCs.

"Most of the on the day surgery cancellations related to pre-operative care are preventable, in fact, easily preventable if the care plans and scheduling take all patients' clinical needs (individualisation of care related to clinical preparation-outcome)… Actually, pre-op nurses' [PONs] actions can prevent most of the on the day surgery cancellations, by completing the clinical protocol (standardised intervention)[and] by addressing all the clinical needs (individualisation of care related to clinical reasons)."

(Participant 21, Surgeon, p. 14)

A theatre practitioner also made an important connection between the following four components: PONs, OTDSCs, individualisation of care and standardised interventions. They suggested that failure to achieve clinical care preparation by PONs because of management of anticoagulation medication (i.e., warfarin) and co-morbidities results in inadequate levels of individualisation of care. The theatre practitioner's comment highlighted that when using standardised interventions (i.e., pre-operative protocol), failure of PONs to individualise care can lead to ill preparing patients for surgery, contributing to OTDSCs for clinical reasons. This implies that PONs play an important role in preventing OTDSCs by completing the pre-operative protocol. Their comments also suggest that, when standardised interventions are used, PONs play a vital clinical role in individualisation of care preparation. The theatre practitioner also argued that "theatres" are blamed for OTDSCs over other departments in the hospital. However, they argued that "theatres" and theatre professionals cannot do much to prevent OTDCSs if patients' individualised needs are not met in pre-operative care.

"They [PONs] have the power to complete the pre-operative protocols (standardised interventions) properly and prevent surgery cancellations [OTDSCs]…when they miss important clinical issues like warfarin [anticoagulation medication] reversal and co-morbidities, anaesthetists cancel the patients...theatres get blamed for surgery cancellations [OTDSCs]. If the patient is not ready or beds not booked, we cannot do much."

(Participant 24, Theatre Practitioner, p. 13)

The theatre practitioner emphasised that OTDSCs resulting from emergencies are hard to prevent, highlighting that PON failure in clinical decisions when using standardised interventions can lead to most of the OTDSCs. They argued that most OTDSCs result from clinical and communication issues, and some resource unavailability (i.e., post-operative beds) and is a consequence of failures in various standardised interventions in pre-operative care. The theatre Practitioner claimed that some unavailability of post-operative beds is related to PONs' failure to identify appropriate post-operative beds based on patients' clinical needs. The comments by the theatre practitioner implies that PONs' failure to schedule individualised care and appropriate resources (i.e., post-operative beds) appears to lead to OTDSCs. It is worth noting that there are different types of post-operative beds based on patients' clinical needs. For example, a healthy patient who has gone through a relatively simple clinical procedure tends to occupy a day-case bed, while an orthopaedic patient who is going through a complex procedure tends to be admitted a to post-operative critical care bed in an orthopaedic ward.

> *"Cancellations [OTDSCs] due to beds are hard to prevent. We need more beds but most of them [OTDSCs] are preventable if pre-op nurses [PONs] complete the pre-assessment protocol and scheduling tools (standardised interventions) properly. Especially most of the clinical and communication cancellations [OTDSCs] are [the result of] the failure of the nurses to complete their paperwork. Even some of the bed problems are because pre-op nurses failed to identify the right beds based on the patients' clinical requirements."*
>
> **(Participant 24, Theatre Practitioner, p. 15)**

Various interview participants' suggested that OTDSCs are a complex and undesired outcome with various links. Some actors (e.g., the theatre practitioner and matron) work in theatres challenge the idea that OTDSCs are a theatre problem. The participants working in theatres argued that they cannot do much to prevent OTDSCs, especially when patients are admitted to hospital for surgery. Some participants working in theatres, argued that OTDSCs are a problem linked to decisions taken by other clinical areas and professionals linked to theatres. Most OTDSCs (e.g., resulting from clinical, communication and resource-related reasons)

appear to be related to various failures in standardised interventions used in pre-operative care or preparing for surgery. The SSCSs rely on various standardised interventions (e.g., pre-assessment protocols, tools, checklists, performance targets) by PONs to prepare patients for surgery. PONs therefore play a vital role in preparing patients for surgery and minimising most OTDSCs, except OTDSCs resulting from emergencies. The next section explains the advantages of various standardised approaches in SSCSs and how they expect to minimise OTDSCs. The next sections present evidence to validate various elements related to IPTs, especially focused on IPT one using the semi-structured interviews.

5.3 how standardisation of care interventions influence OTDSCs

The SSCSs rely on a high level of standardisation to deliver care (standardised interventions, terminology and performance and outcome standards). This section explores the wide use of standardised interventions in healthcare and how they influence healthcare delivery, including OTDSCs.

A surgeon and clinical director stated that standardised interventions such as protocols help to maintain the comprehensiveness of care by improving the individualisation of care and reducing complications or deficiencies in clinical care planning. From their perspectives imply a linear underlining assumption that pre-operative assessment protocols (i.e., standardised interventions used for clinical care planning) create comprehensive individualised care in all contexts or conditions in the form of a “universal” solution. They argued that standardised interventions help to deliver comprehensiveness in care.

> *“I think when parts of the surgery care pathway are standardised, it helps to manage all important parts as a whole, contributing to complete care planning. For example, good pre-op [pre-operative] assessment protocol helps to identify and mitigate all the problems (outcomes) of general surgery patients, which tends to work well in this site.”*
>
> **(Participant 7, Surgeon/Clinical Director, p. 3)**

In addition to maintaining the comprehensiveness of clinical care planning and individualisation of care, the anaesthetist and clinical director highlighted that standardised care planning interventions reduce variation in clinical practice among HCPs, creating consistency in practice. The anaesthetist and clinical director's comments also imply that checklist protocols and forms (standardised interventions) work in a linear way and arguably provide the desired outcome by reducing variation in all contexts or conditions in the form of a "universal" solution. The anaesthetist /clinical director also suggested that standardised interventions help organise care and provide consistency in the delivery of care.

> *"I think by having interventions like checklist protocols and forms (standardised interventions) aimed to standardised process, you create consistency in the system, which everyone working within that organisation understands. So, there are safety checks along the way to ensure that things don't get missed essentially. So, if, for example, for some reason, the patient doesn't get the letter or whatever, it would be flagged within most hospitals that the patient hasn't been to the pre-operative assessment clinic and therefore the patient would be re-contacted, and that would be scheduled. So, it's about within the organisation, reducing variation in processes and therefore being able to identify when there is a deviation from the process that needs to be attended to."*
>
> **(Participant 2, Anaesthetist/Clinical Director, p. 3)**

The surgeon/clinical director suggested using standardised clinical care interventions, aimed at minimising inter-clinician variation and reducing variation of practice, to prepare patients prepare for surgery. They implied that reducing variation might be able to minimise undesired outcomes such as OTDSCs. Furthermore, they suggested that standardised interventions play a vital role in organising clinical information.

> *"I think what you're doing is taking out inter-clinician variability as much as possible to assess – that assessment is of a patient fit enough for the operation they're down for, what you'd hope to achieve by standardisation is that the*

variability between clinicians is taken out of the equation…the protocols are great at organising clinical information."

(Participant 7, Surgeon/Clinical Director, p. 3)

5.4 The role of Standardised interventions in preparing for surgery

The theatre improvement manager suggested that standardised care planning interventions create consistency by reducing variation and improving individualisation of care. Similarly to many other interview participants, there appears to be a linear assumption that standardised interventions can achieve a reduction of variation and a high level of individualisation of care.

"I think it's only what most organisations are trying to achieve, standardisation where we can. Standardised care planning reduces variation in practices by making the process consistent and provides patient-focused care (individualisation of care –outcome)."

(Participant 4, Theatre Improvement Manager, p. 17)

The anaesthetist/clinical director indicated the importance of standardisation and individualisation of care working together in pre-operative care planning. Furthermore, clinical director and anaesthetist PONs play a vital role in making standardised interventions work for individualised care. Some patients undergoing surgery suffer from multiple conditions and may be taking several medications. The analysis suggests that standardised care planning interventions need to be individualised for patient needs. Failure to capture all relevant clinical needs and address them at an individual patient level can create many complications, leading to OTDSCs. The clinical directors suggested that PONs use their clinical autonomy to manage the interplay between standardisation and individualisation of care to improve patient safety and quality. The surgeon also agreed that standardised clinical interventions can have advantages but argued that failures to complete these in an individualised way that addresses all clinical concerns can contribute to OTDSCs for clinical reasons.

"If the standardised process is the patient comes to [the] process, sees a nurse [PONs] and that's that, that's fine, but there should be the opportunity to individualise (outcome) that patient's care and say actually, this patient doesn't look quite right, so they do need to see an anaesthetist or a surgeon or a dentist, or whatever. Individualising as well as standardising."

(Participant 2, Anaesthetist/Clinical Director p. 8)

The matron stated that the high level of standardisation of care in the NHS is factory-like, implying high-level standardisation and limited clinical autonomy for nurses. The matron's comments imply that financial and hospital performance are standardised but do not reflect the reality at the local levels of the hospital. In other words, they implied a mismatch between standards set up and how the local hospital operates. The matron argued that there is a high level of reliance on standardised interventions such as protocols and checklists to deliver care. The matron's comments highlighted that, in some contexts, standardised interventions limit clinical autonomy and can lead to OTDSCs.

"In the NHS, bosses try to performance manage hospitals in a very top-down way like a factory. They set the standardised budget for us, not knowing exactly what is going on at the local level where we have fewer resources (context) than we [hospital] need… There are too many ticking box exercises, protocols and checklists and not enough time to do real nursing (clinical autonomy PONs). [This] is the main problem for most surgery cancellations [OTDSCs].

(Participant 18, Theatre Matron, p. 11)

An anaesthetist registrar argued that various standardised approaches (i.e., clinical care pathways and standardised interventions) tend to control HCPs' (e.g. doctors' and nurses') behaviours. However, they cautioned that too much control of standardisation can lead to OTDSCs for clinical reasons. They suggest that over-reliance on standardisation in SSCSs appears to influence clinical autonomy negatively and leads to OTDSCs for clinical reasons.

> *"Care pathways, protocols and checklists help but they controlled too much how doctors and nurses provide care at the moment, it is all about ticking boxes, that is why we have too many clinical cancellations [OTDSCs for clinical reasons]."*
>
> **(Participant 28, Anaesthetist Registrar, p. 8)**

This section explored how standardisation interventions work and how they could influence OTDSCs. Some argued that standardised interventions used for clinical care planning helped to minimise OTDSCs, by reducing variation and inter-clinician variability and making patient preparation consistent and comprehensive. Others argued that standardisation interventions help to organise information and improve control or oppressiveness and individualised care. Several participants' implied that standardised interventions work in all contexts, and the working assumption is simple and linear. Some comments highlighted that PONs play a vital role in bringing the potential of standardised interventions to individualised care. However, a theatre matron (participant 18, p. 11) implies that high levels of standardisation of care limit the clinical autonomy of nurses, leading to OTDSCs. The anaesthetist registrar (participant 28, p. 8) argued that standardisation of care, including standardised interventions, negatively influenced by doctors and nurses decision making (i.e., HCPs' clinical autonomy) which can lead to OTDSCs.

In summary, standardised interventions help to organise clinical information, improve consistency and minimise variation among HCPs. However, standardised interventions appear to control HCPs' practice, behaviours and roles, sometimes resulting in a negative impact on their clinical autonomy. However, interview participants' comments highlighted that individualisation of care is an important context influencing OTDSCs.

The next section refines the taxonomy developed in Chapter 4 (see section 4.8) and explores how and why standardised interventions fail to achieve individualised care by PONs, leading to different types of OTDSCs.

5.5 Different aspects of individualisation of care and various categories of OTDSCs

The taxonomy and IPTs suggest that various aspects of individualisation of care (i.e., clinical care planning, communication and resources) can lead to different types of OTDSCs (see section 4.8). This section presents evidence to validate and identify mechanisms for how various aspects of inadequate levels of individualisation of care lead to various types of OTDSCs.

5.5.1 Individualised care concerning patient communication and patient-initiated OTDSCs

An orthopaedic surgeon emphasised that communication needs to cover all important areas (i.e., individualisations) for care communication, helping to give assurance and leading to the development of trust among patients, minimising OTDSCs and promoting safe surgical care delivery. They also argued that failure to provide individualised care communication leads to OTDSCs for patient-initiated reasons.

> *"[For] most patients going through a surgery [it] is a very important but anxious event. So most of them cope with knowing all the details about the surgery. So we need to provide the full details to build assurance and trust (mechanism – patients' trust), which is understandable…some patients need lots of support based on their individual situation (individualised care communication) otherwise they do not turn up (OTDSCs because patients decide not to turn up to surgery) or want to wait longer (OTDSCs because patients decide not to undergo surgery)."*
>
> **(Participant 26, Orthopaedic Surgeon, p. 9)**

A surgical nurse explained that, in real practice, patients with diverse communication needs undergo surgery. It is thus vital to achieve individualised care concerning patient communication (i.e., patient-centred communication) to prevent OTDSCs initiated by patients. They highlighted that patients undergoing surgery tend to be

anxious, which can be a barrier to communication between patients and clinical teams. Furthermore, they noted that patients' communication needs can vary because of a lack of familiarity with the English language (e.g., BME patients) or mental health (e.g., depression, anxiety). The surgical nurse emphasised that failure to achieve individualised patient care communication can creates inadequate levels of trust with the clinical team, potentially resulting in OTDSCs for patient-initiated reasons such as DNA and failure to provide consent.

> *"Generally, patients are very anxious throughout the process…if they have language or mental health issues, they need more support. Most patient-led cancellations like DNA [OTDSCs because patients did not attend] and various other communication problems like patients failed to provide consent (OTDSCs because patients decide not to provide consent) at the last minute because they do not trust (mechanism – trust) the hospital because of lack of person-centred communication (individualised care communication)."*
>
> **(Participant 10, Surgical Nurse, p. 12)**

The above quotations from the orthopaedic surgeon and surgical nurse validate some parts of IPT 2 and part of the taxonomy related to patient-initiated OTDSCs, suggest an inadequate level of individualisation of care concerning patient communication (context) can lead to OTDSCs being initiated by patients, for reasons such as DNA and withdrawing consent (main outcome). Using the above quotation, the following CMOC is synthesised.

Inadequate individualisation of care communication among patients undergoing surgery (context) leads to a lack of trust (mechanism) with the clinical team, resulting in initiation of OTDSCs for patient such as DNA, the patient refusing to provide consent and requests to delay surgery on the day of admission (outcome) – CMOC1.

5.5.2 Individualisation of care in clinical care planning and clinician-initiated OTDSCs

The surgeon linked an inadequate level of individualisation of care and clinical care and OTDSCs initiated by clinicians (anaesthetists and surgeons) for clinical reasons.

The surgeon argued that, generally, OTDSCs are caused by failures of pre-operative care planning and are directly linked to PONs' inadequate levels of confidence. The surgeon also highlighted that an adequate level of individualised care related to clinical care planning tends to create trust and appears to minimise OTDSCs for clinical reasons (i.e., minimises patients being unfit to undergo surgery).

> *"Most of the surgery we [surgeons and anaesthetists] cancelled [OTDSCs for clinical reasons – outcome] because of the failure to plan care properly using the pre-op protocol (intervention) based on patient needs (individualisation of care related to clinical care planning context)…when we trust (mechanism) the patient is prepared properly and by addressing all the clinical risk (individualisation of care concerning clinical care planning), there are no problems, the patients get safe passage to surgery."*
>
> **(Participant 26, Surgeon, p. 16)**

The following quotation also emphasises that individualised care in relation to clinical care planning leads to minimising most OTDSCs initiated by clinicians. The surgeon also argued that PONs play a vital role in preparing patients by addressing individualised needs, but they require adequate time and support to prepare patients undergoing surgery. Furthermore, an adequate level of individualisation of care enables surgeons and anaesthetists to trust patient clinical preparation and provide a favourable decision, minimising OTDSCs.

> "*The protocols and checklists help – if the all the patient clinical prepping [preparing] work is done then and PONs address the clinical needs…when we trust all the patient clinical prepping [preparing] work is done properly, we can go ahead with the surgery, providing everything is in order…most surgery cancellations [OTDSCs] are also the result of the failure to address patient needs…They [PONs] need the support and enough time to do the job and identify all the problems like diabetes, warfarin reversal and everything and prepare properly (outcome – individualised clinical care), otherwise the patient is not clinically fit."*
>
> **(Participant 17, Surgeon, p. 14)**

Based on the above quotation from the surgeon, the following CMOCs are synthesised to minimise OTDSCs.

Adequate individualisation of clinical care planning by PONs (context) leads to sufficient trust among anaesthetists and surgeons (mechanism) in the clinical preparation and appears to minimise OTDSCs initiated by clinicians for clinical reasons (outcome) – CMOC 2.

The quotation below from the anaesthetist registrar argues that failure to identify all individualised clinical needs can lead to various clinical risks during and after surgery. They emphasised that even a small unknown clinical risk (i.e., anaemia or cardiac) in some patients leads to OTDSCs for clinical reasons. They also suggested that failure to manage individualised needs concerning communication and resource allocation can lead to OTDSCs. For example, failure to allocate post-operative beds (e.g., day-case, inpatient and critical care beds) based on clinical needs results in resource-related OTDSCs. Similarly, failure to allocate specific equipment based on patient needs can lead to OTDSCs because of the unavailability of theatre equipment.

> "*Sometimes these, the patients' individualised (outcome) needs are not fully managed so we have to [OTDSC] cancel them, sometimes they [PONs] have not provided the right information or not booked the bed type or equipment based on the actual patient's clinical needs…pre-op nurses [PONs] missing an important test like anaemia, cardiac history, can lead to surgery cancellations [OTDSCs] based on patients' overall health, which is a shame but important to patient safety. The last thing we want is major anaesthetic complications or the right bed is not there after surgery."*
>
> **(Participant 28, Anaesthetist Registrar, p. 8)**

The above two quotations in this section (5.4) from participants 26 and 17 validated some parts of IPT 1: an inadequate level of individualisation of care in clinical preparation (outcome) leads to OTDSCs because patients are unfit for surgery (main outcome), initiated by clinicians who review patients on the day of surgery.

5.5.3 Individualisation of care in resource allocation and OTDSCs initiated by administrators

A site manager also highlighted the link between inadequate levels of individualised care related to resource allocation and OTDSCs because of post-operative bed unavailability. Based on their clinical needs, patients require different post-operative beds, such as day-case, inpatient and critical care beds. The site manager highlighted that PON's failure to allocate post-operative beds based on clinical protocol could lead to OTDSCs because of the unavailability of post-operative beds.

> *"Sometimes the day-case patients need critical care beds (resource) on the day because pre-op nurses [PONs] have not considered all the clinical issues and booked the right beds for the patients (individualised care related to resources – outcome)."*
>
> **(Participant 12, Site Manager, p. 8)**

A theatre practitioner also highlighted the link between inadequate levels of individualised care related to resource allocation and OTDSCs because of theatre equipment unavailability. Some patients, based on their clinical needs, require specialist theatre equipment for their surgery. Failure to identify such specialist equipment can lead to OTDSCs initiated by managers because of unavailability of resources (i.e., theatre equipment).

> *"Most of the surgery cancellations due to equipment (resources) is because they[PONs] failed to take into account all the patients' clinical issues (individualised care related to resources – outcome), we try our best to get in it but sometimes it is too late to find the right kit."*
>
> **(Participant 24, Theatre Practitioner, p. 12)**

The two quotations from participants 12 and 24 validated some parts of IPT 3: inadequate levels of individualisation of care concerning allocation of resources based on clinical needs might lead to OTDSCs due to resource unavailability (main outcome),

because managers responsible for providing resources (various types of post-operative beds, staffing and equipment) were unable to provide these due to appropriate resource not being pre-allocated.

Different types of standardisation interventions in clinical care planning, communication and resources are used to prepare patients for surgery. The hallmark of a good scheduled surgical care system is that it enables preparation for surgery, by making sure that patients are prepared and resources are allocated for patients to undergo surgery. Standardised clinical care planning interventions are expected to identify and mitigate any risks based on patients' individual clinical needs before patients are admitted for surgery. The individualisation of clinical care preparation varies from patient to patient and provides an important context to minimise or create OTDSCs for clinical reasons.

Standardised clinical care planning interventions are used to identify and manage pre-existing health conditions such as anaemia, hypertension and diabetes, and any other related conditions. Some patients take medications such as anticoagulation, anti-platelet and ongoing oncological medications, which can sometimes create significant risks during and after surgery. For example, failure to terminate anticoagulation medication for several weeks before surgery results in excess blood loss during surgery and may cause death or affect recovery. During and after surgeons or anaesthetists take responsibility for the patients safety and recovery. The trust of surgeons or anaesthetists(mechanism) that patients' individual clinical needs are addressed appropriately by PONs (pre-operative preparation) is vital to minimise OTDSCs for clinical reasons(outcome).

As with clinical needs, patient communication and resource allocation appear to be unique to each patient. Failure to individualise care in communication leads to OTDSCs initiated by patients. Failure to individualise care related to resource allocation leads to OTDSCs initiated by managers (bed managers or patient flow managers). PONs therefore play an important role in preparing patients undergoing

surgery by completing standardised care planning interventions. The quotations in the previous section validated the proposed taxonomy developed as part of IPT (see section 4.8), highlighting the link between various aspects of individualisation of care (i.e., clinical care planning, communication and resources) that contributed to different categories of OTDSCs initiated by different actors (patients, clinicians and managers). Going further, the analysis, via semi-structured interviews, identified two mechanisms: trust among patients in their clinical team and trust among surgeons and anaesthetists in clinical preparation for surgery. Furthermore, the analysis identified two CMOCs related to patient-initiated and clinician-initiated OTDSCs.

5.6 How the tensions between standardisation and individualisation of care influenced OTDSCs

Both standardised interventions and individualisation of care play a vital role in influencing OTDSCs. Both standardisation and individualisation arguably have an important role in minimising OTDSCs. However, in real care settings, when using clinical care planning interventions by various actors and contexts (mico, meso and macro) create tension between standardised interventions and individualisation of care. Consequently, contributed to OTDSCs.

Despite NHS hospitals relying on standardised interventions to prepare patients for surgery, another surgeon highlighted that NHS hospitals treating patients with varying clinical complexities tend to use a single standardised care pathway consisting of standardised interventions. They also highlighted that comprehensive and individualised care is an important outcome of clinical care planning interventions, an important context for minimising OTDSCs. The surgeon suggested that failure to implement individualised care leads to problems in patient safety and thus to OTDSCs and theatre delays. They argued that, despite differences in patients' clinical complexity, the care pathway (pre-op process) is one-fit-for-all, indicating that NHS hospitals pre-operative care delivery models tend to over-rely on standardisation approaches, but, in practice, individualisation of clinical care is vital to minimise OTDSCs. The surgeon's comment also implies the NHS hospitals model

assumes a linear process relating to how standardised interventions and overall care pathways work in all contexts and conditions.

> *"The problem is that we have a single pre-op process [standardised care pathway] where every patient goes through, and the same set of documentations completed using the same protocol [standardised intervention]. Some complex liver cases require more comprehensive and individualised (outcome) work up in pre-op [pre-operative assessment]; otherwise, we get many complications like on the day of the operation and theatre delays."*
>
> **(Participant 21, Surgeon, p. 8)**

An improvement manager suggested that existing practices tend to use various streamlined processes that do not consider various communication barriers presented by complex social and economic factors. They suggested that, despite the complex and diverse socio-economic needs, patients undergoing surgery are given the same time for pre-operative care, demonstrating the tensions between standardisation and individualisation of care.

> *"But actually, there are many factors, such as socio-economic, cultural, language, financial, which play an important part in patient communication. In my view, patients from very deprived backgrounds (context) can create lots of communication barriers, but our processes are streamlined. We consider that each patient is equal, but they are not."*
>
> **(Participant 20, Improvement Manager, p. 3)**

The surgeon suggested that PONs could address various patients' needs using standardised interventions that can minimise OTDSCs. They argued that not all OTDSCs are preventable, but that PONs' ability to assess and address all individual clinical needs and resources of patients undergoing surgery could minimise OTDSCs. However, PONs' clinical autonomy arguably can help to bring the standardisation and individualisation of care closer.

"Most of the surgery cancellations [OTDSCs] can be preventable if the pre-op nurses[PONs] (actor) complete the pre-assessment protocol (standardised intervention) properly. The problem is, too many tools, protocols, and they [PONs] simply do not have time (meso-context) to make good clinical judgement (clinical autonomy – micro-context), they want to be based on all the patients' clinical and resource issues (individualised care related to clinical preparation and resources)."

(Participant 21, Surgeon, p. 14)

The quotation suggested that, on some occasions, tensions in standardisation and individualisation of care are visible in NHS systems. PONs can address individualised clinical needs using standardised interventions. For example, although each patient has different communication and clinical care planning needs, SSCSs in the NHS appear to use a one-size-fits-all standardised approach. The ability or freedom to act in the best interests of the patient and make independent clinical decisions alongside other professions and disciplines (i.e., clinical autonomy) is a critical condition or context that makes standardised interventions able to create individualised care. The next section explores how various organisational and policy contexts influence PONs' clinical autonomy.

5.7 The impact of austerity measures and unfavourable organisational context on clinical autonomy and Individualisation of care

5.7.1 High levels of standardisation and austerity measures

The matron argued that, in previous years, PONs' nursing roles were affected by high levels of standardisation, consequently, they lost their clinical identity and pride, became unsatisfied with their jobs. The matron suggested that pre-operative care clinics are similar to a "McDonald production line" or factory line (i.e., high standardisation levels with checklists and protocols). As a result, PONs do not have adequate levels of autonomy to respond to patient needs. The matron's experience suggests a connection between inadequate levels of clinical autonomy in PON-influenced behaviour (i.e., compassion) and OTDSCs.

"If you look at it over the years, the pre-op [pre-operative] nurse's job has become a form-filling admin role (micro-context – clinical autonomy) instead of [a] caring profession. Pre-op nurses have lost their pride in being clinical professionals and they are very unhappy with endless protocols, checklists and forms (interventions)… They [pre-operative nurses] have extremely busy clinics due to waiting list targets and double-booking clinics, it is like a McDonald production line. So much documentation and no time for understanding the patient's needs (outcome), doing the nursing job (context – clinical autonomy of PONs) in a caring way (mechanism) to avoid surgery cancellations [OTDSCs]."

(Participant 18, Theatre Matron, p. 7)

Similarly, the surgeon argued that PONs do not have control over their clinical workloads, thus leading to inadequate levels of clinical autonomy. Furthermore, the surgeon highlighted that PONs do not have adequate time to provide care and carefully listen to and empathise with patients' problems. They noted that most clinics completed by PONs are "double-booked", meaning two patients for each clinic slot instead of one. Managers tend to use "double-booked" clinic slots to minimise various target breaches and improve productivity. Usually, pre-op clinic time is between fifteen and thirty minutes but can vary in different organisations. The "double-booked clinics" highlight a lack of clinical autonomy among PONs workload as well as high workloads. The surgeon suggested that the PON role is similar to that of an administrative staff member who completes lots of tick-boxes and forms because of a lack of time, highlighting the lack of autonomy of PONs. They argued that NHS policies have created various pressures for PONs, leading to inadequate levels of clinical autonomy to provide the required care.

"The main issue is pre-op nurses do not have control over their clinical workload (micro-context) to do their nursing job properly because of lack of time (micro-context) and support (micro-context)… Most nurse clinics are double-booked (meso-context), all the nurses are doing is filling the forms and ticking boxes like glorified admin staff now (micro-context related to clinical autonomy)."

(Participant 26, Surgeon, p. 16)

The theatre matron explained that NHS policy has led to various undesired outcomes such as OTDSCs, excessive staff sickness and delayed discharges. The matron highlighted that the NHS puts a lot of pressure on staff to achieve various standardised budgets and targets (e.g., waiting lists), leading to various undesired outcomes, delayed discharges, high sickness levels among healthcare workers and OTDSCs. The theatre matron highlighted that, despite staff shortages and emergency demand, the NHS has a regulatory process managed by a central body to manage the hospital, adding further pressure to HCPs. The theatre matron narrative illustrates the high levels of pressure in NHS hospitals resulting from various aspects of standardisation and challenges (i.e., high emergency pressure, staff shortages) at the time of the data collection.

> *"There is lots of pressure from [the NHS] to make everything standardised, achieve budget targets and that target and this target, causing a whole heap of problems like staff sickness (additional outcomes – undesired outcomes), discharge delays (additional outcomes – undesired outcomes) and surgery cancellations at organisation level… Despite all the lack of staff and beds to deal with emergency demand (context), they bring the CQC [Care Quality Commission] to monitor us."*
>
> **(Participant 18, Theatre Matron, p. 11)**

5.7.2 The impact of high emergency admissions and the influence of this on PON practice

During the data collection period, OTDSCs resulting from emergency prioritisation were a common problem in the English NHS. The directors of performance in a university hospital explained the significantly high levels of emergency pressures experienced by NHS hospitals. The director also highlighted that overcrowding in emergencies meant that surgical nurses and PONs have to look after emergency patients. They noted that surgical nurses and PONs are extremely unhappy about or "hate" looking after emergency patients as it interrupts their provision of pre-operative care for their patients.

"Last winter [for] around four weeks we had emergency patients in almost every elective bed in the hospitals… All the pre-op [PONs] and surgical nurses were told to look after medicine patients, which they [PONs] absolutely hate because it interrupts their pre-op[Pre-operative] work"

(Participant 6, Director of Performance, p. 2)

A surgical nurse suggested that difficulties faced by emergency care patients tend to be more noticeable than growing elective lists or waiting times for cancer treatments. They explained that, when emergency departments are overcrowded, it is noticeable, leading to emergency patients being prioritised and resulting in surgery cancellation, even for patients with a cancer diagnosis. Emergency interruptions mean that nurses do not have time, or the clinical autonomy to provide care for pre-operative patients.

"When the emergency [department] is going to get full, you can feel the panic even in the surgical theatres and everyone can feel it. So you know the emergency department is going to get full. So you know that it is a crisis moment because it's happening right now in the moment. What you don't see in that moment is that you're cancelling [a] colorectal cancer patient who is suffering from [a] late stage of cancer and terrified that his/her operation got cancelled, and [the] cancer waiting list is growing. So [you] have two very bad things in front of you, you have an urgent versus important dynamic happening, and we are close to our patients and know what is going on… We hate going to look after patients in medicine [patients admitted via emergency admission] because we do not have time to do our job (context) and provide the time our patients [scheduled surgical care patients] deserve in our pre-op [pre-operative] clinics."

(Participant 10, Surgical Nurse, p. 7)

The theatre practitioner's statements highlighted the link between emergency interruptions, clinical autonomy and OTDSCs for clinical reasons. Theatre

practitioners argue that PONs are under significant pressure because of emergency interruptions. Consequently, this negatively affects the clinical autonomy of PONs, leading to OTDSCs because of inadequate levels of pre-operative care.

> *"Emergency interruptions (meso-context) create lots of problems for nurses[PONs], plus the high workload. They cannot do their nursing job (micro-context) the way they want… Most of the good nurses leave the job. It is too much pressure for them, this is why we have so many on the day cancellations[OTDSC] (main outcome) due to pre-op* [Pre-operative care] *problems."*
>
> **(Participant 24, Theatre Practitioner, p. 14)**

The analysis reveals that wider NHS policy and health economic contexts related to high emergency admissions have negatively influenced hospital practices because of overcrowded hospitals and interruptions to patient flow. The analysis revealed that, because of clinical risk and policy drivers, hospital managers prioritised resource allocation for patients admitted via A&E. It is, therefore, difficult to prevent resource-related OTDSCs resulting from emergency pressures. However, the analysis identified that OTDSCs related to pre-operative care planning, communication and scheduling are common in the NHS and can be preventable. To manage overcrowding (i.e., patients in corridors and surgical wards), hospital leaders regularly deploy surgical care nurses and PONs to look after patients admitted via A&E. Consequently, this has created unfavourable working conditions because of regular interruptions, which has led to high workloads, lower job satisfaction, high staff turnover and no time to do their jobs, as well as inadequate levels of clinical autonomy and higher levels of OTDSCs.

5.7.3 Policy and the impact of workforce shortages and high workload on the clinical autonomy PONs

This section explains how workforce shortages of HCPs, including anaesthetists, negatively influence the clinical autonomy of PONs. The deputy clinical director provided a good explanation of the impact of various NHS policies (i.e., macro-context)

on NHS hospitals (meso-context) and the consequent influence on HCP practice, resulting in OTDSCs. The deputy clinical director explained that, because of acute care bed reduction, challenges in staff recruitment and retention and austerity or cost-saving measures much pressure is placed on HCPs in the NHS. According to NHS policy, despite all these difficulties, hospitals are expected to deliver various national performance standards related to waiting times. The combination of effects has created a high workload and stressful environment for healthcare professionals, which has a negative impact on competencies and confidence in their clinical decision making. In addition to all these policy challenges, the deputy clinical director emphasised that workforce shortages have a negative influence on pre-operative surgical care, influencing OTDSC levels.

> *"The whole hospital is affected by austerity measures (macro-context) and cost improvement initiatives (macro-context). The [NHS] trust is trying to save millions from cost savings plus we are under pressure to deliver waiting list targets (meso-context) while managing high demand for emergencies… Most of these problems relate to surgery cancellations [OTDSCs] that you talk about are coming from a combination of national issues (macro-context) and very little we can do… We are also well short of pre-op nurses[PONs], anaesthetists and theatre staff (meso-context)… We are losing lots of experienced clinical staff, especially pre-op nurses [PONs], due to too much pressure (micro-context), which directly impacts surgery cancellations…"*
>
> **(Participant 11, Deputy Clinical Director, pp. 23–24)**

A divisional manager argued that national NHS policy relating to workforce planning and immigration negatively affects the clinical autonomy of PONs, resulting in lack of time and interprofessional collaboration and leading to OTDSCs. They also highlighted national shortages of anaesthetists, which have a big impact on OTDSCs. It is worth noting that anaesthetists used to work closely with PONs, and most pre-operative clinics used to be managed by both PONs and anaesthetists. In most NHS trusts, anaesthetists provide clinical supervision or guidance to improve PON development. The divisional manager explained that anaesthetist shortages have led to PONs taking on aspects of the anaesthetist workload with very little training and support, leading to

lots of deficiencies in pre-operative care planning and OTDSCs. The PON workload was further increased by an organisational drive to achieve various national performance targets for cancer, set out in national policy. Divisional managers argued that all the challenges negatively influence PONs and mean that PONs do not have time to complete their clinical responsibilities for the benefit of patients. As a result, a lack of clinical autonomy to provide the required pre-operative care is apparent. The comments from the divisional manager suggest that a combination of national policy and organisational contexts have created an unfavourable working environment, leading to an inadequate level of clinical autonomy. This results in inadequate pre-operative care, which impacts OTDSCs, as well as high levels of staff turnover. Comments from the divisional manager suggest that PONs do not have the clinical autonomy to make decisions for the benefit of the patient.

> "*We struggle to recruit staff (meso-context) because of the national policies related to workforce planning and immigration (macro-context), suppose you take the example of shortages of anaesthetists (meso-context) having a major impact on surgery cancellations… Nurses*[PONs] *are dumped with most of the pre-op work with little extra training and advice from anaesthetists (lack of interprofessional collaboration – meso-context). They*[PONs] *are going the extra mile but under lots of pressure. Another issue is all the directors push us to hit national targets (macro-context), which [is] understandable. The nurses*[PONs] *do not have time to do their clinical work(meso-context) and provide what they used to provide to patients."*
>
> **(Participant 16, Divisional Manager, p. 8)**

The theatre improvement manager also confirmed the comments from the divisional manager (participant 16), arguing that PONs' work is negatively affected by anaesthetist and nursing shortages, high levels of standardisation and lack of support, contributing to OTDSCs. Comments such as "cannot stand up to managers" and "they have very little control over their role" in the quotation below highlight that PONs have very little autonomy. The theatre improvement manager suggested a link between unfavourable working conditions (e.g., high workload and significant pressure) and OTDSCs, claiming that the clinical autonomy of the PONs is critical to

minimisation of OTDSCs. The theatre improvement manager explained that macro-contexts (NHS policy) have led to unfavourable working conditions for PONs, such as high workloads and high levels of stress, thus negatively affecting their clinical autonomy and contributing to OTDSCs. Going further, the theatre improvement manager claimed that, in the last few years, NHS policy has negatively affected PONs' job satisfaction and led to a high level of staff turnover in the wider NHS.

> *"The problem is we have too much pressure from CQC, NHS England (macro-context) plus the management (meso-context) to achieve cost reductions and waiting-list targets. Especially, pre-op nurses*[PONs] *have been under lots of pressure… they are badly affected by very high workloads due to anaesthetists and nursing shortages (meso-context). This is the real cause of all these surgery cancellations[OTDSC]. Pre-op nurses'*[PONs] *work is critical to avoid all types of surgery cancellations[OTDSCs]… [In the] last few years, we lost lots of good nurses due to NHS pressures (meso-context). They have very little support from anyone and cannot stand up to management to do the real nursing job. They are asked to do as [they are] told by the managers to get the targets done. They have very little control over their role (micro-context) and [are] extremely unhappy with the job (micro-context). This is a big problem in all NHS trusts, the nurses*[PONs] *are not happy with their jobs. Without good nurses*[PONs]*, we will always have big problems like surgery cancellations [OTDSCs] and delayed discharges."*
>
> **(Participant 4,Theatre Improvement Manager, p. 21)**

The iterative analysis from semi-structured interviews appears to validate that the findings in the IPT phase related to use of standardisation interventions have increased in pre-operative care to achieve high-efficiency levels (section 4.6). Some participants suggested that pre-operative care or SSCSs are "factory-like" or "McDonald production lines". Furthermore, some participants highlighted that PONs need to complete a "high level of documentation" and an "endless level of checklists and forms". In response to the NHS performance target related to elective care, pre-operative care clinic times have been limited to fifteen to twenty minutes. The strong

emphasis on standardisation interventions and standard clinic time for pre-operative time slots is used to achieve efficiency to comply with national performance and to bring about a waiting list related to elective care.

NHS hospitals appear to rely on the assumption that a high level of standardisation leads to high quality, including minimum OTDSCs and other undesired outcomes. However, in practice, the combination of unfavourable working conditions driven by NHS policy and high levels of standardisation arguably has a negative impact on the clinical autonomy of PONs. As a result, increased OTDSCs take place because of failures to individualise pre-operative care, consisting of clinical planning, communication and scheduling. The analysis also identified a link between inadequate clinical autonomy, individualisation of care and OTDSCs. Going further, some participants also suggested that inadequate levels of clinical autonomy leads to an insufficient level of compassion and self-efficacy in PONs. This leads to failure to deliver individualised clinical care.

PONs used a series of standardised interventions to prepare patients for surgery to try to achieve, by means of standardised clinical care planning, individualisation of clinical care planning, which provides a vital context for the minimisation of OTDSCs. In contrast, failure to achieve individualisation of clinical care leads to OTDSCs. The next section explores the inner workings of standardisation and individualisation with the help of standardised clinical care planning interventions and inadequate levels of clinical autonomy, and how these lead to OTDSCs initiated by clinicians for clinical reasons.

The analysis in this section (5.6.3) explained how various macro-contexts influenced the use of standardised interventions by PONs when preparing patients for surgery. The findings highlights that, during the data collection period, there were significant pressures and policy challenges in NHS hospitals (macro-contexts), such as austerity measures, high levels of emergency pressures, performance targets and workforce shortages (i.e., shortages of anaesthetists), with various “ripple effects“

resulting in a number of unfavourable organisational contexts. PONs play a vital role in managing the interplay between standardisation and individualisation of care in SSCS, especially in preparing patients for surgery. When using standardised interventions, unfavourable contexts resulting from NHS policy create high workloads and work pressures, lack of interprofessional collaboration and emergency interruptions, which appear to affect PONs' clinical autonomy negatively and have led to various failures in individualised care, thus leading to OTDSCs. Some participants argued that PONs had lost their professional identity, while others described them as "glorified admin staff" engaging in "ticking boxes". Figure 5.6-1 demonstrates how macro-contexts (e.g., austerity measures, lack of social care, drive to achieve NHS performance targets, shortages of anaesthetists) negatively influence PONs' clinical autonomy when delivering care using standardised interventions to prepare patients for surgery, thus creating conditions and contexts leading to inadequate preparation of patients for surgery and OTDSCs.

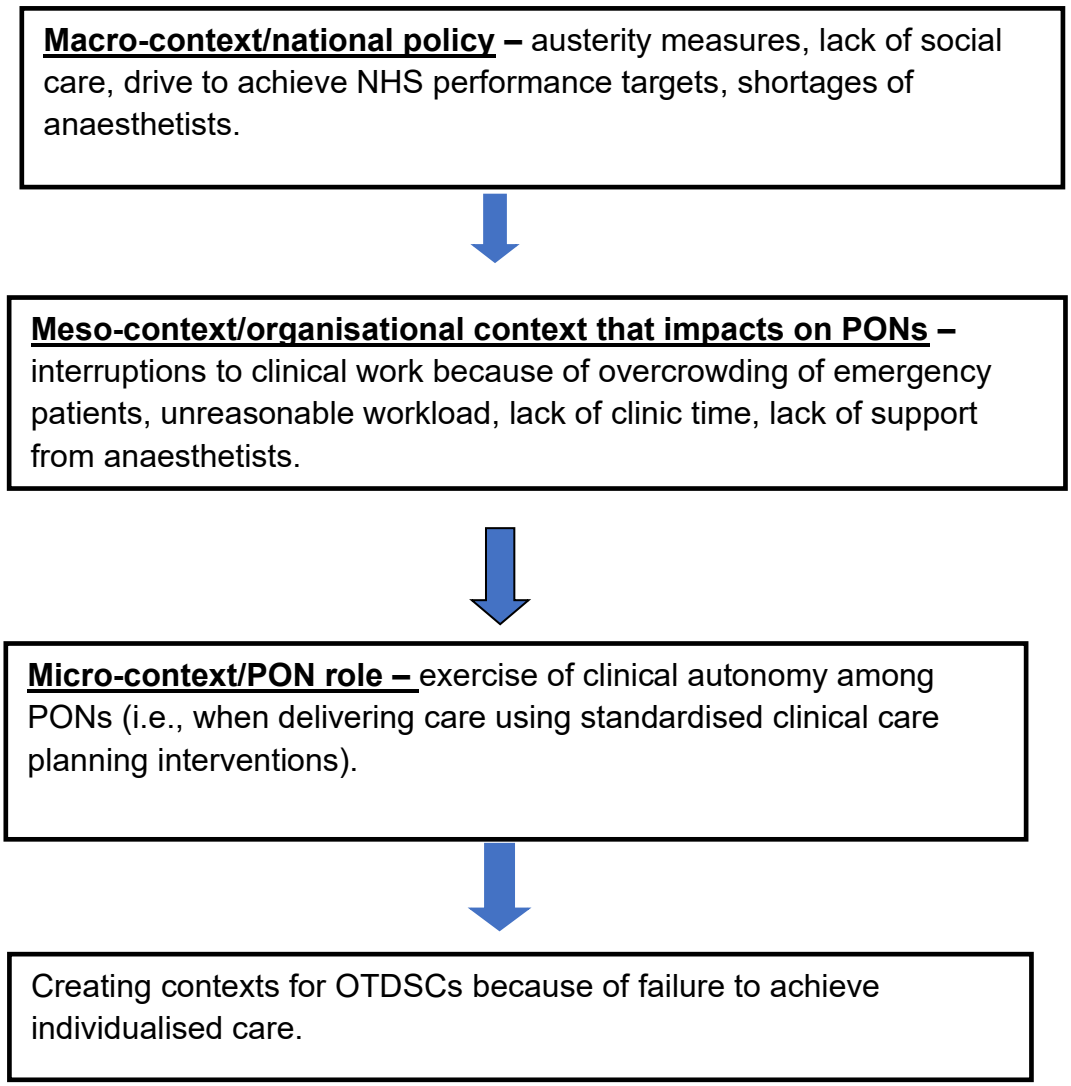


Figure 5.7-1 How macro-context negatively impacts meso-contexts and leads to an inadequate exercise of clinical autonomy among PONs, influencing standardised intervention practice.

5.7.4 Inadequate levels of PON clinical autonomy influence individualisation of care and behavioural mechanisms

The previous section explored how various unfavourable organisational contexts (e.g., interruptions to clinical work because of overcrowding of emergency patients, unreasonable workload, lack of clinic time, and lack of support from anaesthetists) triggered by various NHS decisions and policy contexts that influenced the clinical autonomy of PONs. This section briefly explains how inadequate levels of PON clinical autonomy influence individualisation of care and behaviours such as compassion, self-efficacy and situational awareness among PONs. This might,

therefore, influence various aspects of individualisation, sometimes leading to various types of OTDSCs.

In the quotation below, the matron links a lack of inadequate time, self-efficacy and OTDSCs, highlighting that PONs are under significant pressure because of NHS policy and unfavourable organisational contexts. Furthermore, matron explained that they do not have enough time in their clinical consultation because of standard fifteen-minute time slots and a significant amount of paperwork resulting from various standardised interventions. A lack of time to instil confidence in clinical decisions (i.e., self-efficacy) can lead to high levels of OTDSCs for clinical reasons.

> *"They are under pressure and have no time (meso-context) to do proper clinical consultation in their clinics… all this affects patients personalisation of care (i.e., individualisation of care)…There is way too much paperwork and most pre-op clinics have only fifteen-minute clinic slots (meso-context) and no time (meso-context) to make good confident clinical decisions (mechanism), this is why surgery cancellations [OTDSCs] are high due to clinical reasons."*
>
> **(Participant 18, Theatre Matron, p. 11)**

One surgeon argued that the following interconnected themes minimise OTDSCs: adequate clinical time for PONs, compassion and self-efficacy among PONs and individualised patient clinical care. The surgeon's comments also highlighted that, in some contexts, standardisation of care can lead to OTDSCs. The surgeon also highlighted that pre-operative care in NHS hospitals had been standardised, which is similar to a 'factory line' to improve productivity (i.e., save money), leading to high levels of standardised interventions or the creation of 'factory-like' pre-operative care services (i.e., "pre-op hubs"). However, the surgeon argued that it is vital to have adequate clinic time to make clinical decisions, benefiting individual patients and minimising OTDSCs. The comments from the surgeons indicate that, despite standardisation in pre-operative care settings, it is vital to ensure that adequate time is provided to PONs to have clinical autonomy to minimise OTDSCs. The surgeon

also highlighted that compassion and self-efficacy help to achieve high levels of individualisation of care, which is also vital to minimise OTDSCs.

> *"To save money, they [NHS management] create pre-op hubs for nurses. It is like [a] factory line of documentations and checklists. Way too much ticking boxes but very little time (micro-context) for real confident clinical decision making (self-efficacy – mechanism) is the real cause of surgery cancellations [OTDSCs]…there is no time (meso-context) for them to [exercise] good, confident, clinical judgement (self-efficacy – mechanism) and real emotional caring and empathising (mechanism – compassion) with patient needs (individualisation of care."*
>
> **(Participant 17, Surgeon, p. 9)**

This section explains how inadequate levels of clinical autonomy among PONs, resulting from various unfavourable organisational contexts, influence various behaviours – compassion, self-efficacy and situational awareness among PONs – which impacts on OTDSCs for clinical reasons.

Figure 5.8-1 depicts various links made in sections 5.2 to 5.7 focusing on OTDSCs for clinical reasons. The arrows link each component and OTDSCs, showing how they might contribute to OTDSCs for clinical reasons. For example, the link between pre-assessment tools, checklists and protocols and OTDSCs for clinical reasons using. The PONs use pre-assessment tools, checklists and protocols to prepare patients, meaning that the box related to pre-assessment tools, checklists and protocols is linked to PONs' clinical autonomy.

However, because of NHS policy and macro-contexts (i.e., austerity measures, lack of social care, drive to achieve NHS performance targets and shortages of anaesthetists) appears to create unfavourable organisation conditions such as interruptions have resulted because of overcrowding of emergency patients, unreasonable workload, lack of clinic time and lack of support from anaesthetists,

negatively influencing the clinical autonomy of PONs. The box related to the clinical autonomy of PONs is linked to unfavourable organisational contexts and OTDSCs. Furthermore, the box related to the clinical autonomy of PONs is linked to inadequate clinical autonomy, which leads to insufficient levels of compassion, self-efficacy and situational awareness among PONs. The boxes related to insufficient levels of compassion, self-efficacy and situational awareness among PONs are linked to OTDSCs and inadequate levels of individualisation of care in clinical preparation. Figure 5.8-1 demonstrates the causal web of interactions and complex nature of OTDSCs.

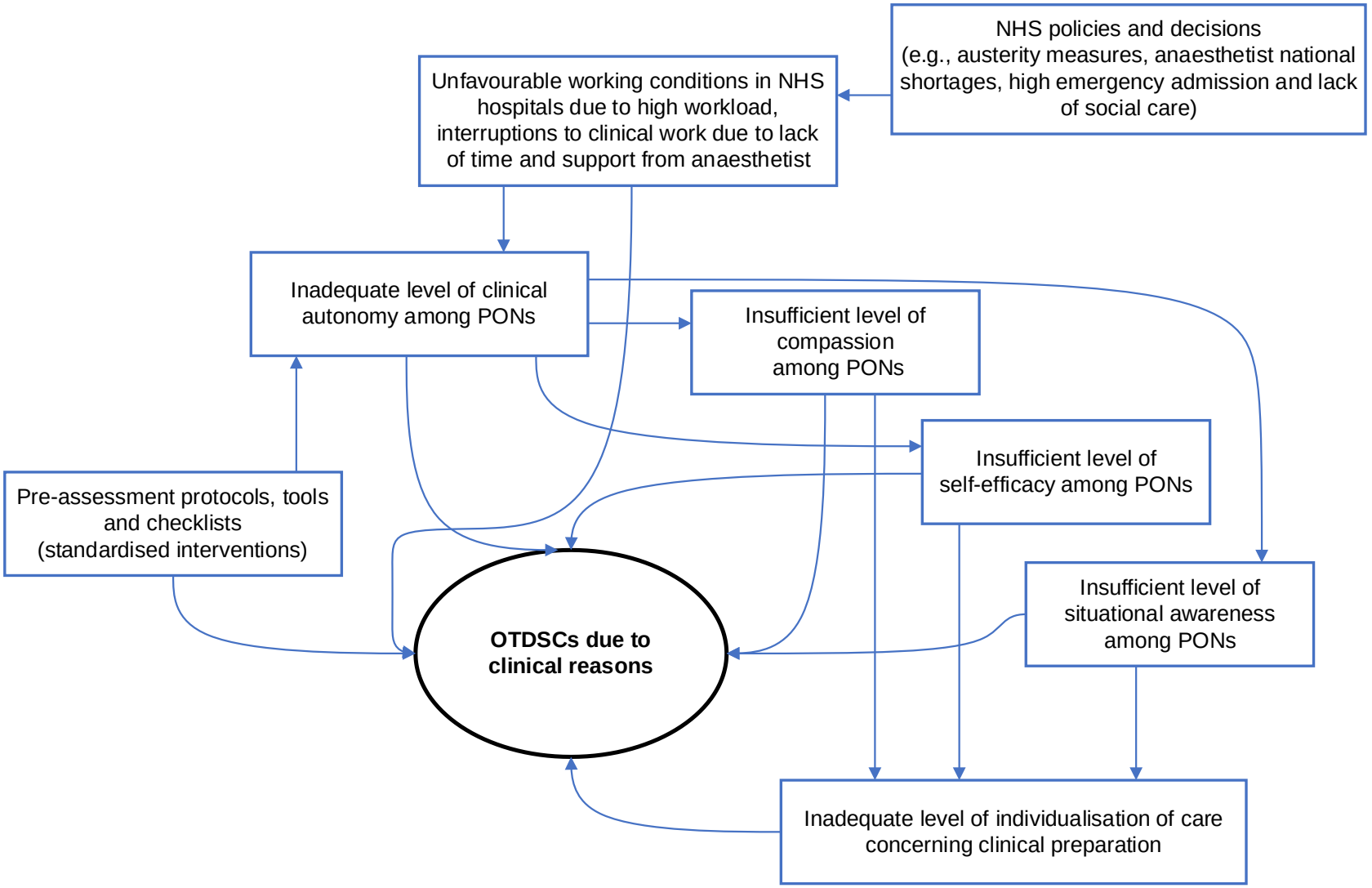


Figure 5.7-2 Complex and interconnected nature of OTDSCs for clinical reason

5.8 Chapter summary

The chapter presents several pieces of evidence related to IPTs and the research questions, which explain how, why, and in what contexts OTDCSs are generated and minimised. The evidence from semi-structured interviews validates various aspects of IPT 1 and the taxonomy developed using multiple pieces of evidence, which is presented in Chapter 4.

The chapter has explained that SSCSs in the NHS heavily rely on standardisation of care and are designed based on a linear assumption that various standardised interventions generate desired outcomes. Standardised clinical care planning interventions help to organise clinical information and reduce variation among HCPs. However, while managing variation is helpful, in practice, various aspects of individualisation of care also provide an important context for minimising OTDSCs. It is therefore important to pay attention to both the standardisation and individualisation of care to minimise OTDSCs.

Standardised clinical care planning interventions have the ability to minimise OTDSCs for clinical reasons. Similarly, standardised communication interventions can minimise OTDSCs for patient reasons and standardised resource allocation could minimise OTDSCs because of unavailability of resources such as post-operative beds or equipment. However, in practice, standardised interventions are influenced by various complex contextual factors. Although standardised interventions help to minimise OTDSCs, in practice, various contextual factors create different types of individualisations of care, which lead to different types of OTDSCs.

The evidence from semi-structured interviews validates the proposed taxonomy of OTDSCs presented in section 4.8. The chapter presents evidence suggesting that various types of individualisation of care (clinical care planning, communication and resource allocation) provide an important context and can influence the creation of various types of OTDSCs. Inadequate levels of individualisation of care in clinical care preparation for surgery leads to OTDSCs initiated by clinicians because, for

example, patients are not ready to undergo surgery for clinical reasons (i.e., failure to manage commodities or medication). Inadequate levels of individualisation of care in resource allocation can lead to OTDSCs because of unavailability of resources such as theatre equipment, professionals and post-operative beds. Similarly, an inadequate level of individualisation of care in communication of care when preparing for surgery can lead to OTDSCs initiated by patients for reasons such as DNA and failure to provide consent.

The semi-structured interviews also identified trust as an important mechanism influencing OTDSCs, including trust among clinicians (mostly anaesthetists) in the patient's clinical preparation and trust among patients undergoing surgery in the clinical team.

In practice, standardised clinical care planning interventions arguably control HCPs' behaviours, including PON behaviours, thus negatively influencing clinical autonomy. Evidence from semi-structured interviews also indicates that PONs' clinical autonomy is influenced by various organisational contexts. Furthermore, various NHS policy decisions (i.e., austerity measures, national workforce shortages, high emergency admissions and lack of social care) create unfavourable working conditions for PONs, who play a vital role in preparing and minimising OTDSCs. PONs' clinical autonomy is arguably negatively influenced by lack of time, high workload and interruptions resulting from high numbers of emergency patients. Consequently, when delivering care using standardised interventions, inadequate levels of clinical autonomy among PONs can lead to insufficient levels of compassion, self-efficacy and situational awareness and thus inadequate levels of individualisation of care, potentially resulting in OTDSCs for clinical reasons.

OTDSCs are a complex undesired outcome linked to standardised interventions and various aspects of individualisation of care where PONs' clinical autonomy is influenced by various organisational and policy contexts and behavioural mechanisms. However, despite the complexity involved, most OTDSCs can be

minimised. The next chapter, using the twenty-eight semi-structured interviews, further explores the evidence and presents a series of CMOCs that influence OTDSCs.

6 Chapter – causal configurations

6.1 Introduction

This Chapter continues the refinement of IPT 1 using 28 semi-structured interviews, as in Chapter 5. Based on the analysis presented in Chapter 5, this chapter develops CMOCs to explain OTDSCs and how to minimise them.

The CMOCs are based on how PON clinical autonomy (context) influences the three main behavioural mechanisms (compassion, self-efficacy and situational awareness) among PONs. This consequently influences the individualisation of care in clinical care planning (outcome). For example, OTDSCs appear to be activated by inadequate levels of clinical autonomy among PONs (context), leading to an inability on the part of PONs to sufficiently activate the three main behavioural mechanisms (compassion, self-efficacy and situational awareness). This can result in inadequate levels of individualisation of care concerning clinical care planning (outcome), providing a context for OTDSCs for clinical reasons. In contrast, OTDSCs appear to be reduced by adequate levels of clinical autonomy among PONs (context), leading to sufficient activation levels of the three main behavioural mechanisms among PONs. This results in adequate levels of individualisation of care in clinical care planning (outcome), providing a context for minimising OTDSCs for clinical reasons.

Like the earlier chapter, due to the interconnected nature of the evidence, structuring this chapter was challenging. The structure was divided into two main parts. Section one (6.2) discussed how standardised clinical care planning interventions influenced OTDSCs and present CMOCs, while the other explained how standardised clinical care planning interventions present CMOCs minimised OTDSCs (6.3). Using the CMOCs from both sections, the chapter presents a programme theory.

6.2 CMOC explanation for how, why and in what contexts OTDCSs emerge

The chapter 5 also identifies four behavioural mechanisms among PONs: self-efficacy, compassion, situational awareness and trust. The previous chapter

highlighted that various unfavourable NHS organisational policies led to the emergence of unfavourable NHS hospitals and contributed to OTDSCs (section 5.6), leading to inadequate levels of clinical autonomy among PONs and negatively influencing the behaviours of PONs (i.e., behavioural mechanisms – self-efficacy, compassion and situational awareness) and leading to inadequate levels of individualisation of care. Building on already presented in Chapter 5 as the foundation, the next section presents CMOCs that lead to OTDSCs, drawing on findings from the semi-structured interviews.

6.2.1 Unfavourable working environment, clinical autonomy and insufficient levels of compassion

The following section explains how unfavourable working environments result in inadequate levels of clinical autonomy among PONs, leading to insufficient levels of compassion among PONs and thus to inadequate individualisation of care when using standardised clinical care planning interventions.

The site manager identified that combinations of significantly high workloads, staff shortages and emergency interruptions limit the clinical autonomy (context) of PONs and influenced OTDSCs related to pre-assessment clinics, including clinical reasons. The site manager's comments implied the three sub-processes of compassion (mechanism) highlighted in Chapter 2 in section 2.3.2: noticing or acknowledging suffering, empathising and actioning accordingly. For example, the site manager's comments highlight that PONs do not have the opportunity to notice or acknowledge suffering, empathise or take action accordingly for patients to whom they provide undergoing surgery because of unfavourable working conditions. As a result of unfavourable organisational contexts, they are unable to provide compassionate care, which can lead to OTDSCs clinical reasons due to clinical reasons.

> *"The interruptions, like very high workload, emergencies, documentation, staff shortages (meso-contexts) really affect [how] the nurses do their job (micro-context clinical autonomy)…in this kind of working environment the nurses*

[PONs] do not have the headspace to do their job properly by carefully listening and empathising [with] (mechanism – compassion) patients' worries, problems, and addressing clinical concerns (mechanism – compassion). That is why we have very high [levels of] surgery cancellations [OTDSCs] due to pre-assessment issues."

(Participant 12, Site Manager, p. 9)

The anaesthetic/clinical director emphasised that PONs are competent and skilful HCPs, but indicated that unfavourable working environments impact PONs, making it more difficult for them to achieve clinical autonomy. They also highlighted that failure to prepare patients for surgery, incorporating identifying patients' clinical needs and addressing them (i.e., individualised care concerning clinical care planning – outcome), provides an important context for OTDSCs. The anaesthetic and clinical director comment that *"they missed many important things [like] medication and cardiac problems"* can be interpreted as showing inadequate levels of individualisation of care. The anaesthetist/clinical director also confirmed the importance of being thoughtful and caring (mechanism – compassion) and making clinical decisions with confidence (mechanism – self-efficacy) enable PONs to achieve individualisation of care in clinical care planning.

"Nurses' [PONs] failure to be thoughtful and caring (mechanism – compassion) and [have] confidence in their clinical decisions (mechanism – self-efficacy) caused lots of problems in preparing patients for surgery (outcome – individualised care)...they missed many important things [like] medication and cardiac problems…I think they are good, skilful, caring professionals, but they cannot do the job because of the bad working environment (high workload, emergency patient interruptions, staff shortages) and very little support."

(Participant 2, Anaesthetic and Clinical Director, p. 2)

The surgeon's comments highlight that unfavourable organisational context [levels of work pressure) do not enable PONs to act with adequate levels of clinical autonomy to act compassionately. Their comments on being empathetic and caring can be interpreted as compassion(mechanism). The surgeon also highlighted that

unfavourable organisational context [levels of work pressure) significantly negatively impact achieving the individualisation of care.

> *"You cannot work under this level of pressure (unfavourable organisation contexts) and be empathetic and caring (mechanism – compassion) and expect them [PONs] to do a good nursing job (context – clinical autonomy)…patient-focused care (individualisation of care) is very hard and can not achieve when they are under consistent pressure "*
>
> **(Participant 26, Surgeon, p. 14)**

An associate director explained that inadequate levels of clinical autonomy resulting from lack of time among PONs influence compassion in PONs, is integral to individualisation of patient care. They highlighted that the role of the nursing professional is to be compassionate, identifying patients' needs, empathising and acting accordingly (i.e., with compassion). However, a lack of time and support meant that PONs do not have clinical autonomy, which arguably influences compassion among PONs. The associate director's comments imply that PON clinical autonomy, because of lack of time, influences compassion in PONs.

> *"They [PONs] are under significant pressure from all sides but no support (meso-context)… Nursing is all about being empathising, holding patients' hands when needed and acting in, responding in a caring way (mechanism – compassion) and personalised way to provide assurance to patients (individualisation of care - outcome)… They do not have time to do their nursing job properly (context – clinical autonomy) in a caring way (mechanism – compassion)."*
>
> **(Participant 23, Associate Director, p. 17)**

The surgeon argued that PONs inadequate levels of clinical autonomy and lack of time to care which results in insufficient levels of compassion among PONs which is linked to OTDSCs and recovery from surgery. The surgeon's comments highlighted caring, being sensitive and attending to patients emotional needs can be interpreted

as compassion and also come closer to the idea of the three components (section 2.3.2) of compassion (noticing, empathising and responding).

> *"They [PONs] rarely have time to talk to patients and do their nursing job while listening and empathising with patients' problems (compassion – mechanism)… Caring and being sensitive and attending to their emotional needs are very important to prevent surgery cancellations [OTDSCs] and improve their recovery from surgery."*
>
> **(Participant 26, Surgeon, p. 16)**

A deputy medical director highlighted that a "caring attitude and action" is key to minimising OTDSCs and many other problems, arguing that, when nurses have a "caring attitude and action" and understand the impact of their practice, they take necessary actions to complete interventions and minimise OTDSCs. Their comments highlighted the adequate time for clinics is important to encourage caring behaviours in nurses and also highlight NHS hospitals' failure to provide protected time in clinics and a supportive environment to improve the "caring and compassionate way". Although the deputy medical director did not fully articulate the concept of "caring attitude and action", this suggests that "A good doctor or nurse is a caring and sensitive professional", indicating that "caring attitude and action" is about noticing and understanding others' suffering (i.e., empathising). Responding can be interpreted as compassion, as explained in section 2.3.2.

> *"Caring attitude and actions (mechanism – compassion) of the nurses matters so much to avoid many things like surgery cancellations [OTDSCs] and many others' problems… A good doctor or nurse is a caring and sensitive professional, not just completing forms and checklist[s]. When they care (mechanism – compassion) about their patients, they understand their impact on patients' lives and will do everything to benefit patients, like learning the skills and saying they are not sure. The problem in this place is we do not provide protected time for clinics and a supporting environment [to] do their nursing job in a caring and compassionate way."*
>
> **(Participant 11, Deputy Medical Director, p. 18)**

The associate director made the link between how NHS policy influences organisations and inadequate levels of clinical autonomy and compassion among PONs and OTDSCs. The associate director highlighted that PONs do not have enough support and time in their clinics because of waiting list pressures created by NHS policy. Their comments highlight that the role of nursing professionals requires compassion, which includes identifying patients' needs, empathising and acting accordingly. However, comments by the associate director suggest that PONs have lost their professional freedom. Furthermore, the associate director confirmed that PONs have little control over their workloads, which has contributed to OTDSCs related to clinical reasons.

> *"Our pre-op nurses [PONs] have lost their professional freedom (clinical autonomy) because of too many standardisation and austerity measures in the NHS (macro-context)… Nursing is all about empathising, holding patients' hands when needed and acting in, responding in a caring way (mechanism – compassion) and personalised way to provide assurance to patients (individualisation of care -outcome)… They [PONs] are under significant pressure from all sides due to wating lists (macro-context) and very little help from anyone. There is way too much pressure for them [PONs]. They work under very bad conditions and only have fifteen-minute clinic slots (meso-context) and no time to do their nursing jobs. This is why surgery cancellations [OTDSCs] are high due to clinical reasons."*
>
> **(Participant 23, Associate Director, p. 17)**

Quotations from the surgeon (participant 26) and associate director (participant 23) highlight that these unfavourable conditions have a negative impact on providing compassion (mechanism) and care, resulting in inadequate levels of individualisation of care. Considering the quotations in the following, CMOCs were developed. Unfavourable working environments (involving, for example high workloads, interruptions because of emergency interruptions and unreasonable work-related stress) lead to inadequate exercise of clinical autonomy among PONs (context), resulting in insufficient levels of compassion (mechanism) when completing

standardised interventions (i.e., care protocols, checklists), leading to inadequate levels of individualised care in relation to patients' clinical preparation of patients undergoing surgery (outcome) [CMO-6.1].

6.2.2 Unfavourable working environments, clinical autonomy and insufficient self-efficacy

The following section explains how an unfavourable working environment results in inadequate levels of clinical autonomy among PONs, leading to insufficient levels of self-efficacy and inadequate individualisation of care in clinical care planning preparation.

The site manager claimed that the following components influenced OTDSCs: unfavourable organisational environments, insufficient level of self-efficacy of PONs and the individualisation of care related to clinical preparation. They highlighted that PONs are under huge pressure, which has an impact on their clinical autonomy. Furthermore, unfavourable contexts lead to completing standardised interventions related to clinical care preparation without confident clinical decision making, leading to OTDSCs and delayed discharges for clinical reasons. The site manager also highlighted failure in confident clinical decision making, and the impact on OTDSCs and leaders in several undesired outcomes (i.e., delayed discharges). Failure in confident clinical decision making can be interpreted as self-efficacy.

> *"The problem is nurses are under huge pressures (meso-context) and firefighting every day at work (macro-context), they just complete the protocol, that is why we have many surgery cancellations [OTDSCs] based on clinical reasons… They need to make confident clinical decisions (mechanism – self-efficacy) in a comprehensive way to prepare patients (outcome – individualised care concerning clinical reasons) for surgery to avoid problems like last-minute surgery cancellation [OTDSCs] and delayed discharges (additional outcomes) due to clinical problems… They really need to keep that in mind in their [PONs'] decision making [which has a] big impact later in the care pathway."*
>
> **(Participant 12, Site Manager, p. 9)**

The theatre practitioner highlighted the influence of failure of self-efficacy among PONs on preparing patients for surgery or individualised care and clinical preparation (outcome).

> *"Pre-op nurses'* [PONs'] *lack of good and confident clinical decisions (mechanism –self-efficacy) is one of the main reasons why the patients are not clinically prepared properly (outcome – individualised care concerning clinical reasons)."*
>
> **(Participant 24, Theatre Practitioner, p. 15)**

The surgeon made an important connection and provided an explanation for how unfavourable organisational contexts can lead to insufficient levels of self-efficiency among PONs and inadequate levels of individualisation of care, resulting in OTDSCs for clinical reasons. The surgeon explained that inadequate levels of individualised care in clinical care planning leads to OTDSCs for clinical reasons. The surgeon's comments highlight that, because of NHS policies, PONs are working in unfavourable working environments, resulting in high workload, emergency pressure and stress, and leading to inadequate time for compassionate care or self-efficacy in clinical decisions, which would minimise OTDSCs.

> *"The nurses [PONs] need to prepare patients very carefully [and] identify all the clinical problems to avoid patients being unfit for surgery or any types of surgery cancellations [OTDSCs]. That is the most important step for everything… Nurses [PONs] have very high workloads (meso-context) and are under lots of stress due to emergency pressures (meso-context), [which] has affected their ability to do their job and make sound clinical judgements. [This is] why we have so many surgery cancellations [OTDSCs]… Their confidence in clinical decisions (mechanism – self-efficacy) is going downhill and all they seem to be doing is filling the protocol."*
>
> **(Participant 26, Surgeon, p. 14)**

In light of these experiences, CMOCs were developed. Interruptions due to emergency pressure and shortages of HCPs lead to unfavourable working

environments and an inadequate exercise of clinical autonomy among PONs (context), resulting in insufficient self-efficacy (mechanism) when completing standardised interventions (i.e., care protocols, checklists). This leads to inadequate individualised care being provided in clinical preparation of patients undergoing surgery [CMO-6.2].

6.2.3 Lack of inter-professional collaboration and insufficient self-efficacy

The following section explains how a lack of inter-professional collaboration between anaesthetists and PONs leads to insufficient levels of self-efficacy among PONs, consequently, leads to inadequate individualisation of care in clinical care planning preparation.

The theatre matron argued that lack of inter-professional collaboration between PONs and anaesthetists contributed negatively to PONs' clinical decision making, thus negatively influencing PON clinical autonomy. Furthermore, the theatre matron explained that a high workload and standardisation has led to a lack of teamwork and collaboration between anaesthetists and PONs.

> *"Everyone is under so much pressure and firefighting and trying to tick boxes without real teamwork or collaboration (meso-context – lack of inter-professional collaboration). A few years ago, pre-op [pre-operative] clinics used to be run with close clinical supervision from anaesthetists… Any issues, they [PONs] run through the anaesthetist, which is [an] important part of building confidence (self-efficacy) in their job… A lack of anaesthetists in pre-op [pre-operative] clinics is a big factor in why we have so many clinical cancellations [OTDSCs due to clinical reasons]."*
>
> **(Participant 18, Theatre Matron, p. 13)**

The nurse in charge argued that, although healthcare actors' roles are prescribed by various standardised interventions and specific clinic times, in practice, PONs' clinical decision making involve other professionals, including anaesthetists. The nurse in charge claimed that, when PONs receive support from anaesthetists increased self-efficacy can result in minimisation of OTDSCs due to patients being

unfit for surgery. They are more likely to understand doctors' requirements to gain a "favourable decision" related to clinical readiness to undergo surgery. The nurse in charge also highlighted that, by working alongside anaesthetists, PONs gain situational awareness of anaesthetists' expectations:

> *"There are so many checklists and protocols (standardised interventions) to fill in a specific clinic time but in real practice the clinical decision making about surgery is a social and multi-disciplinary process where nurses need lots of support from doctors to get that necessary understanding to prepare patients the way anaesthetists expect… Like the old days, the nurse works alongside the anaesthetists in pre-op* [pre-operative] *clinics. This is how nurses get the confidence (mechanism – self-efficacy) to complete the pre-op* [pre-operative] *protocols (standardised interventions) the way anaesthetists need them to (mechanism – situational awareness)."*
>
> **(Participant 27, Nurse in Charge, p. 6)**

Interruptions because of high emergency pressure and anaesthetist shortages lead to a lack of inter-professional collaboration between anaesthetists and PONs and less influence in clinical autonomy (context) which in turns leads to insufficient self-efficacy (mechanism) when completing standardised clinical care planning interventions, this results in inadequate individualised care in clinical care planning (outcome) [CMO-6.3].

6.2.4 Lack of inter-professional collaboration and insufficient situational awareness

The following section explains how a lack of inter-professional collaboration among anaesthetists and PONs leads to insufficient PON situational awareness, which leads to inadequate individualisation of care in clinical care planning preparation. As highlighted in section 2.3.3, situational awareness can be identified in three interconnected components: perception of the current situation or gathering information, comprehension of the current situation or interpreting information, and ability to project what can happen in the future or anticipation of future states (Endsley, 1995).

The senior surgical registrar argued that lack of inter-professional collaboration between PONs and anaesthetists has negatively influenced situational awareness and self-efficacy among PONs. As a result, it leads to an inadequate level of surgery cancellations. They also claimed that, historically, PONs and anaesthetists used to work closely together, providing opportunities to exchange knowledge with each other. However, various organisational changes because of NHS policies (i.e., emergency patient interruptions and staff shortages) negatively affect inter-professional collaborations. This leads to a failure in knowledge exchange in relation to the clinical expectations of the anaesthetist who reviewed the patient before the surgery. As a result, PONs' clinical autonomy is negatively affected, leading to insufficient clinical efficacy and situational awareness. Each patient undergoes surgery and has a comprehensive assessment by an anaesthetic and clinical team to identify risks before surgery. In this context, PONs need to manage various expectations related to clinical risk and safety in their decision making as well as documentation – for instance, any risks identified or interventions carried out. The senior surgical registrar's comments highlight that failure to understand anaesthetists' expectations to completely standardise clinical care protocol (standard protocol) could be interpreted as a failure to interpret information and project what could happen in the future, resulting in inadequate situational awareness among PONs.

> *"Most of the clinical cancellations [OTDSCs] are due to nurses' failures in good clinical decisions (mechanism – self-efficacy) or failure to understand anaesthetist clinical expectations (mechanism – situational awareness) [to] complete the protocol…this is why patient-centred care(outcome-individualisation of care) fails and create OTDSCs…. [In the] last few years, sadly, due to all these emergency and staff shortages, we lost all of that teamworking culture between the pre-assessment nurses [PONs] and anaesthetists (context – inter-professional collaborations)."*
>
> **(Participant 15, Senior Surgical Registrar, p. 5)**

The anaesthetist registrar also explained how inadequate levels of situational awareness and self-efficacy among PONs lead to OTDSCs, noting that when PONs

fail to perform or refer patients for various diagnosis tests and management of their medication, the anaesthetist registrar tends to cancel their surgery for clinical reasons (OTDSCs for clinical reasons). They highlighted that PONs need to be aware of what the anaesthetist expects when they have an anaesthetist review. In other words, patients undergoing surgery must be prepared with the anaesthetist's clinical requirements or expectations. Projection/anticipating future states is the third component of situational awareness (section 2.3.3).

Failure to achieve any of the three components related to situational awareness can lead to inadequate levels of situational awareness among PONs, leading to OTDSCs for clinical reasons. Furthermore, the anaesthetist registrar also highlights the link between PONs' confidence in clinical decision-making (i.e., self-efficacy) when preparing patients for surgery and OTDCs.

> *"We cancelled [OTDSC] the patient because we think the patient is not clinically safe to undergo surgery… the pre-op nurses [PONs] have missed something in their clinical judgement that we think is important, like blood tests, scans or management of anticoagulation… It is all about understanding anaesthetist expectations (mechanism – situational awareness) and making confident clinical decisions (self-efficacy) to prepare patients for surgery."*
>
> **(Participant 28, Anaesthetist Registrar, p. 11)**

The theatre practitioner made an important connection between the situational awareness of PONs when preparing patients based on clinical reasons and OTDSCs for clinical reasons. They suggested that each patient undergoing surgery has different clinical requirements and expectations from an anaesthetic perspective. PONs need to be aware of this to gain a favourable outcome from the anaesthetist who reviews patients on the day before undergoing surgery. Explaining further, the theatre practitioner highlighted that some patients need referral specialists while others require management of their medication and further investigation. PONs, therefore, need to be aware of the anaesthetist's expectations and prepare patients for surgery for a favourable outcome. In other words, each patient's clinical journey within the surgical care pathway differs based on organisational policies and

anaesthetist expectations when reviewing patients before surgery. The theatre practitioner also mentioned that, in the previous review, each anaesthetist had a tendency to assess patient risks differently. This means that, when preparing patients for surgery, PONs need to have situational awareness of patient individualisation of care as well as anaesthetist expectations to minimise OTDSCs for clinical reasons.

> *"The nurses [PONs] need to know what is clinically expected from them in each patient on the clinical pathway to get through the anaesthetist review otherwise the anaesthetist cancels them… This is very tricky as things vary from anaesthetist to anaesthetist…some patients need mental health support from specialists or weight loss support or medication taken out, or further clinical investigation… When they have not done something clinically important or [it is] missed by nurses [PONs] or has not been documented properly, the anaesthetist tends to cancel [OTDSC] them [patients undergoing surgery]."*
>
> **(Participant 24, Theatre Practitioner, p. 15)**

The site manager argued that a lack of situational awareness among PONs, because of failure to ask the right questions or identify clinical issues, can result in OTDSCs for clinical reasons. They suggested that, on some occasions, PONs failed to ask appropriate questions of the patient undergoing surgery, which led to a failure to identify cardiac issues and infections before admission to surgery. This suggests that PONs complete standardised interventions (i.e., pre-assessment protocols) without being fully aware of various clinical problems or risks of patients undergoing surgery. As a result, high levels of OTDSCs for clinical reasons can emerge. Sometimes, other cultural, cognitive and mental health issues come to light, leading to patients not providing comprehensive answers in the first instance repetition, resulting in an inadequate individualisation of care.

> *"Most cancellations [OTDSCs] and delayed discharges happened [when] they [PONs] failed to understand things outside their protocol [standard intervention] when they [PONs] scheduled patients (admitted to surgery)… They need to gather important information so that patients ask the right questions (mechanism – situational awareness), and it is no use when they*

(clinical team reviewing the patient before surgery) find cardiac issues or their previous infections on the day of the surgery… Just completing pre-op [pre-operative] protocols is not enough. That is why we have so many last-minute surgery cancellations [OTDSCs] due to clinical problems."

(Participant 12, Site Manager, p. 10)

The surgeon argued that the lack of inter-professional collaboration between PONs, anaesthetists and surgeons leads to insufficient levels of situational awareness and self-efficacy among PONs. As a result, this might lead to inadequate individualisation of care in clinical care preparation. The surgeon explained that clinical practice is continuously changing, which influences clinical preparation and OTDSCs. For example, new knowledge related to new drugs and best practice guidelines tends to change, which affects surgeons' decision making (i.e., how they perceive clinical risks and expectations of clinical preparation) related to OTDSCs for clinical reasons. However, according to the surgeon, PONs are expected to reflect this new knowledge relating to new drugs and best practices and influence surgeons' clinical decision making (i.e., encouraging changes of situation related to knowledge) to minimise OTDSCs for clinical reasons. Failure to understand how new knowledge influences decision makers can be interpreted as situational awareness.

The surgeon claimed that, historically, PONs, surgeons and anaesthetists worked closely to prepare patients for surgery, which allowed them to exchange knowledge (i.e., about new drugs and best practice guidelines) and build confidence in PONs' decision making (i.e., self-efficacy). However, various organisational and national policies have negatively affected inter-professional collaboration between PONs, anaesthetists and surgeons, which led to failures in learning opportunities. In other words, PONs need to be aware of various external and rapidly changing factors influencing the clinical decision making of anaesthetists and surgeons to minimise OTDSCs. Lack of inter-professional collaboration has led PONs to inadequate level of understanding some of the components related to situational awareness such as perceptions of the current situation or information gathering, and comprehension of the current situation or interpreting information. The surgeon argued that failures in

inter-professional collaboration between PONs and surgeons can lead to insufficient situational awareness and self-efficacy among PONs, arguably negatively influencing individualisation of care concerning clinical care planning.

> *"Clinical decisions are a kind of art that cannot be captured in a protocol…especially due to improvement and changes. It is important that nurses [PONs] understand these changes to avoid cancellations [OTDSCs], especially clinical reasons like new medication and treatments... We used to work closely and support our nurses, especially anaesthetists, to provide a wider understanding [of what] they need to do (mechanism – situational awareness) and build confidence in their clinical decisions (mechanism – self-efficacy)… The issue is that everything is disconnected now in the NHS because everyone is so busy firefighting, we rarely meet our pre-op nurses [PONs]."*
>
> **(Participant 21, Surgeon, p. 8)**

Considering the evidence, CMOCs were developed focusing on insufficient situational awareness (mechanism) among PONs. Interruptions because of high emergency pressure and HCP shortages lead to a lack of inter-professional collaboration between anaesthetists and PONs, resulting in inadequate levels of clinical autonomy exercised among PONs (context) and provision of insufficient situational awareness (mechanism) among PONs when completing the standardised clinical care planning interventions. This leads to inadequate individualised care in clinical care planning (outcome) [CMO-6.4].

6.2.5 Lack of clinical time, clinical autonomy and inadequate levels of self-efficacy

The following section explains how a lack of time for patient consultation among PONs leads to inadequate levels of PON clinical autonomy and thus insufficient levels of self-efficacy and inadequate levels of individualisation of care in clinical care planning preparation. The surgeon highlighted that patients' clinical (i.e., co-morbidities, respiratory issues, anti-coagulation, medications) and mental health problems (i.e., depression and anxiety) can vary. PONs therefore require adequate

clinic time to manage patients individual needs related to their physical and mental health. However, in practice, the surgeon highlighted that standard clinic time is ten to fifteen minutes, which is insufficient clinical time to make confident clinical decisions. The surgeon argued that PONs do not have adequate time because of high workloads and short clinic times. This impacts negatively on their clinical autonomy and self-efficacy in their clinical decision making. The surgeons' comments also highlight that a failure to address patients' individual clinical needs leads to OTDSCs.

> *"You need time to understand patients' clinical needs including co-morbidities, respiratory and cardiac issues, anti-coagulation, medications, depression and anxiety (context)… They [PONs] do not have time to make good sound clinical decisions (mechanism) for patients and do their nursing job (context – PON clinical autonomy). Nurses only get ten to fifteen minutes in their clinics to do their job. [This] is the main reason we have so many cancellations (OTDSCs for clinical reasons) due to anti-coagulation and medication management problems."*
>
> (**Participant 26, Surgeon, p. 3)**

In light of the evidence highlighted, CMOC was presented. PONs' lack of time to interact with patients results in inadequate levels of clinical autonomy (context) and insufficient levels of self-efficiency when completing standardised clinical care planning interventions. This leads to inadequate individualised care in clinical care planning (outcome) [CMO-6.5]**.**

6.2.6 Low trust levels among clinicians, patients' clinical readiness and OTDSCs for clinical reasons

The following section explains how low levels of trust among clinicians leads to OTDSCs for clinical reasons. The surgeon argued that failure to identify clinical risks (e.g., anaemia, hypertension, medication, pain, anti-coagulants) in patients

undergoing surgery leads to anaesthetists having a low level of clinical readiness and thus leads to OTDSCs for clinical reasons.

> *"Duty anaesthetists do not trust (mechanism) that all the individual clinical issues and risks like anaemia, hypertension, medication, pain or anti-coagulants are not managed properly, that is why they get [surgery] cancelled because of patients unfit for surgery (outcome)."*
>
> **(Participant 21, Surgeon, p. 8)**

Given the evidences, the following CMOCs is presented. Inadequate levels of individualised clinical care planning (context) leads to a low level of trust among clinicians and low patient clinical readiness (mechanism) for surgery. This can result in OTDSCs for clinical reasons (outcome) [CMO-6.6].

6.2.7 Failure in clinical care planning leads to resource-related OTDSCs because of resource unavailability

The theatre practitioner indicated that a failure of individualised care related to inadequate clinical care planning which could lead to OTDSCs because of an unavailability of resources. They argued that OTDSCs and theatre efficiencies are directly linked to good and confident clinical decision making among PONs in pre-operative care. Confidence in clinical decision making can be interpreted as self-efficacy. The theatre practitioner's comments show an example where the failure of PONs to allocate appropriate post-operative care based on patients' clinical needs leads to OTDSCs because of resource unavailability (i.e., post-operative beds). The theatre practitioner argued that there were not enough critical care beds in the hospital and, if critical care beds are not booked based on patient's needs, OTDSCs are likely because of unavailability of critical care beds.

> *"Cancellations [OTDSCs] due to bed problems like critical care beds are due to problems in nurses' clinical decisions (mechanism – self-efficacy)… We [NHS trust] do not have enough critical care beds, so if they did not book the right bed based on the patient's condition (outcome – individualisation of care in clinical care planning), the patient is going to get cancelled [OTDSCs due to critical care bed unavailability] for sure."*

(Participant 24, Theatre Practitioner, p. 16)

The critical care nurse also indicated that failure of individualised care related to inadequate clinical care planning could lead to OTDSCs because of an unavailability of resources. The critical care nurse highlighted that failure to allocate appropriate beds has resulted in OTDSCs because of resource unavailability. They also indicated that PONs are under significant pressure from high workloads and appear to have inadequate clinical autonomy ("ticking box exercise").

> *"Pre-op [pre-operative] nursing has become a box-ticking exercise (context – lack of clinical autonomy) due to high workload. This is why we have too many wrong bed booking problems that end up needing critical care beds after the patient is admitted to the hospital (main outcome), which gives no chance to provide a bed."*
>
> **(Participant 24, Critical Care Nurse, p. 7)**

In light of that evidence, the following CMOC is presented. PONs with high workloads mean a low level of clinical autonomy (context), leading to inadequate self-efficacy (mechanism) when completing standardised clinical care planning interventions and inadequate individualised care in resource planning (outcome), which can result in OTDSCs because of unavailability of resources [CMO-6.7].

6.2.8 Summary of CMOCs related to standardised clinical care interventions OTDSCs

All the CMOCs related to IPT, one identified in sections 6.2.2 to 6.2.7, are summarised and presented in table 6.2.1.

No.	Context	Mechanism	Outcome/Context
CMO 6.1	Low level of clinical autonomy of PONs because of unfavourable working environment	Low level of compassion in PONs	Inadequate levels of individualisation in clinical care planning or clinical readiness
CMO 6.2	Low level of clinical autonomy of PONs because of unfavourable working environment	Low level of self-efficacy in PONs	
CMO 6.3	Low level of clinical autonomy of PONs because of lack of inter-professional collaboration	Low level of self-efficacy in PONs.	
CMO 6.4	Low level of clinical autonomy of PONs because of a lack of inter-professional collaboration	Low level of situational awareness in PONs	
CMO 6.5	Low level of clinical autonomy because of a lack of clinical time	Low level of self-efficacy in PONs	
CMO 6.6	Inadequate levels of individualised clinical care planning	Low level of trust among clinicians' and patients' clinical readiness	OTDSCs for clinical-initiated reasons
CMO 6.7	Low level of clinical autonomy in PONs because of high workload	Low level of self-efficacy in PONs	Inadequate level of individualisation in resource allocation

Table 6.2-1: Summary of CMOCs leading to OTDSCs because of tension between standardisation and individualisation of care

6.2.9 Refining IPT one

Using data from semi-structured interviews with a wide variety of actors, this chapter has identified and explained various CMOCs linked to IPT one, which focuses on both the creation and minimising of OTDSCs for clinical reasons. This section refines IPT one by presenting all the evidence from Chapters 5 and 6.

In the NHS, SSCSs depend heavily on various standardised interventions (i.e., pre-assessment tools, protocols, checklists) and approaches (i.e., performance targets, care pathways, terminology) were introduced to minimise various types of OTDSCs. However, in practice, the inner working of standardised interventions is far from linear, straightforward and simple. Standardised clinical interventions aim to bring various benefits to minimise OTDSCs, organise clinical information, minimise inter-clinician variability and prepare patients for surgery. However, on some occasions, standardised interventions contribute to OTDSCs, suggesting that standardised interventions are not a “panacea” or “universal solution” to minimise undesired outcomes.

The findings of sections 5.2 to 5.7 validate IPT one (refer to table 4.8-2), and the CMOCs found that, when care is delivered using standardised clinical care planning interventions (i.e., checklists, clinical protocols, pre-assessment tools) to prepare patients for surgery, the ability of PONs (actor) to exercise clinical autonomy is negatively influenced by various unfavourable organisational conditions (meso-contexts). The semi-structured interview findings also assert that inadequate levels of individualisation of care in clinical preparation (outcome) lead to OTDSCs initiated by clinicians who review patients on the day of surgery because patients are unfit for surgery (main outcome). On some occasions, inadequate levels of individualisation of care in clinical preparation can lead to OTDSCs because of resource unavailability (unavailability of post-operative beds).

In practice, PONs’ clinical autonomy is influenced by various unfavourable organisational contexts (high workload, inadequate time to complete patient

consultations and interruptions because of emergencies) and various NHS policies and national decisions. Consequently, inadequate levels of PON clinical autonomy negatively impacts compassion, self-efficacy and situational awareness among PONs, which leads to inadequate levels of individualisation of care and OTDSCs for clinical reasons. Inadequate levels of individualisation of care in clinical care planning leads to insufficient levels of trust among anaesthetists who review patients before surgery, resulting in OTDSCs for clinical reasons.

Although OTDSCs create a significant amount of waste for organisations and lead to suffering for patients who experience them, it is arguably an important safeguarding measurement as part of the system design. For example, failure to minimise clinical risks because of inadequate preparation or individualisation of care results in various patient safety complications (e.g., general anaesthetist complications, excess blood loss), including after surgery (e.g., complications in recovery). However, improving individualised care by preparing patients can minimise OTDSCs. The next section explains how to minimise OTDSCs for clinical reasons.

6.3 CMOCs that explain how, why and in what contexts minimised OTDCSs

This section presents CMOCs using selected evidence from interviews related to IPT 1, which focuses on minimising OTDSCs. During the data collection period, OTDSCs appear to have been very high, representing a significant problem, and participants enthusiastically expressed their views related to how, why and in what contexts OTDSCs emerge in NHS hospitals.

Favourable organisational contexts such as adequate time, support and inter-professional collaboration enable the clinical autonomy of PONs and activate behavioural mechanisms (i.e., self-efficacy, compassion and situational awareness) in PONs. Creating a high level of individualised clinical care preparation consequently leads to trust among anaesthetists relating to clinical preparation, resulting in the minimisation of OTDSCs. The following section presents various data fragments related to dyads and triads developed CMOCs, which minimise OTDSCs.

Section 5.2 provides a range of evidence that OTDSCs are complex and happen for various reasons but are preventable. The following short section emphasises that OTDSCs can be an important safety measure for patients undergoing surgery. The surgeon argued that OTDSCs are an important safety step related to patient safety, which means that OTDSCs are necessary to avoid serious complications during (intra-operative) or after (post-operative) surgery. The surgeon therefore argued that OTDSCs should not be used as a performance target. In other words, the surgeon highlighted that the anaesthetist's review is focused on identifying various clinical risks during or after surgery. The surgeon elaborated that OTDSCs are part of important safety measures, involving checking relevant equipment to complete surgery and post-operative beds. As a result of such a review, the clinical team decides whether to continue or discontinue the surgery, which, on some occasions, can lead to OTDSCs. For example, as part of the review or safety check, if the team found that there was no post-operative bed for the patient, they would cancel the surgery because of the unavailability of post-operative beds.

> *"You cannot prevent all surgery cancellations [OTDSCs] and you should not have specific targets for surgery cancellations [OTDSCs]... It [OTDSCs] is part of a safety check done before, is the right bed available post-operatively, intra-operative equipment there to complete the surgery… ?"*
>
> **(Participant 26, Surgeon, p. 11)**

The next section explains how various organisational contexts lead to adequate levels of clinical autonomy, activating behavioural mechanisms (self-efficacy, compassion, situational awareness) among PONs and leading to improvements in individualisation of care, thus creating conditions that minimise OTDSCs for clinical reasons.

6.3.1 Inter-professional collaboration and compassion

The following section explains how inter-professional collaboration can lead to adequate exercise of clinical autonomy among PONs (context) to provide high levels

of compassion (mechanism) when completing standardised interventions (i.e., care protocols, checklists), resulting in adequate individualised care when patients' clinical preparation (outcome) is being carried out for patients undergoing surgery.

The anaesthetist and clinical director suggested that clinical competencies and compassion are both important to prevent OTDSCs and that HCPs understand the impact of OTDSCs on patient care and patients,so tend to act with compassion. The anaesthetist and clinical director's comments on a *"caring attitude"*, *"understanding the impact to patients*" and *"care about the patients"* can be interpreted as compassion.

> *"It is the clinical skills and also the caring attitude [that] prevent things like surgery cancellations [OTDSC]… When staff understand the impact of their actions and care about patients (mechanism), they do everything they can to prevent things like delay discharges and surgery cancellations [OTDSCs]."*
>
> **(Participant 2, Anaesthetist/Clinical Director, p. 10)**

The surgeon and clinical director argued that compassion and self-efficacy among PONs are important to achieve individualisation of care for clinical preparation. Adequate clinical time and a supportive working environment for PONs are identified as vital contexts that enable clinical autonomy to improve compassion and self-efficacy among PONs. Good listening, sensitivity to patients' emotions and kind actions can be interpreted as compassion.

> *"We need nurses [PONs] with good listening, sensitivity to patients' emotions and kind actions (mechanism – compassion) and good clinical judgement (mechanism – self-efficacy) to understand the patients' clinical problems. To do that we need to provide enough clinic time (context), skills and supportive working conditions."*
>
> **(Participant 7, Surgeon/Clinical Director, p. 3)**

The exchange between the researcher and participants (i.e., surgical care nurse) shows how compassion from surgical care nurses helps to minimise OTDSCs within

the context of standardisation. The surgical care nurse's comments and overall example can be considered as demonstrating how inter-professional collaboration creates an adequate level of clinical autonomy to improve individualisation of care in clinical care planning.

The surgical nurse highlighted that, for preparing, patients undergoing surgery, they are usually only allowed to provide a single pre-assessment clinic slot. However, the nurse identified elderly care patients who were undergoing surgery with multiple co-morbidities and required more than one pre-assessment clinic slot, such patients would benefit from additional time to understand all their clinical needs. The surgical nurse understood that, if additional time was not provided, such patients are likely to be victims of OTDSCs for clinical reasons, which can cause a significant level of suffering and be inconvenient to patients and carers. Surgical nurses are therefore encouraged by matrons and anaesthetists (inter-professional collaboration) to exercise of clinical autonomy for the benefit of patients undergoing surgery while overcoming pressures from waiting list management. The surgical care nurse's comments can be interpreted as compassion (refer to section 2.3.2)

The comments highlighted that the surgical nurse acknowledges patients' suffering, empathises and takes action to provide a second appointment to improve individualisation of care and clinical preparation or readiness where necessary. As a result, they manage to minimise OTDSCs for clinical reasons.

> ***Researcher*** *– Can you give me an example of how the caring mindset (mechanism – compassion) you talked about prevents on the day of surgery cancellations due to clinical reasons?*
>
> ***Surgical care nurse*** *– Yes, I can give many examples,... We give two clinic slots to some patients, which is against the protocol (standard interventions).*
>
> ***Researcher*** *– Sorry, how does that work in terms of a caring mindset (mechanism –compassion) to prevent on the day surgery cancellations due to clinical reasons?*

Surgical care nurse *– Currently, we are allowed to offer one 15-minute pre-op [pre-assessment care clinic] slot for any patient. This one-slot standard in the protocol (standard interventions) does not work for some patients, especially elderly patients with many conditions who take many types of medications, they need lots of explanations, and we need to be caring…*

Researcher *– Sorry, how does that work in terms of preventing on the day surgery cancellations due to clinical reasons?*

Surgical care nurse *– Yes, because they need more time to prep [prepare] the patient, so, we [PONs] give an additional pre-assessment slot, which is against the protocol. We [PONs] asked them to bring medications or other information to the second clinic appointment so we can understand all the problems and medications they take. Otherwise, these patients are going to get cancelled on the day of admission due to clinical reasons. I was told off a few times by going against the protocol, but I know very well that these complex elderly patients get cancelled if I do not give additional slots and complete their care plans. To be honest, we should not be cancelling [OTDSCs] these patients at any cost. Sometimes their children come from abroad or far away, stay with these elderly parents to help after the surgery. We must think of the caring side (mechanism – compassion), and the impact they have…*

Researcher *– Thank you… So what is the response from your managers?*

Surgical care nurse *– (laughs)… For managers, it is all about a numbers game … They (management) are not going to be happy… Luckily, our lead consultant anaesthetist and matron know all about this and are very supportive (inter-professional collaboration – context)…"*

(Participant 10, Surgical Nurse, p. 25)

This scenario emphasises the argument made by previous participants regarding how compassion among PONs minimises OTDSCs. If the surgical nurse continues with the standardised procedure and provides one slot for each patient, based on the surgical nurse's comments, these elderly patients with complex needs will likely end up with OTDSCs for clinical reasons.

This example illustrates the tension between the various aspects of standardisation of care (protocols, standard clinic times and one pre-assessment clinic policy), creating tension in the individualisation of care for patients. Furthermore, this highlights that the combination of standardisation of care and pressures from various national and organisational policies can limit the clinical autonomy of PONs. However, inter-professional collaboration can help to provide an adequate level of clinical autonomy for PONs, leading to adequate individualised care in patients' clinical preparation.

Support from anaesthetists and matrons (inter-professional collaboration) can lead to adequate exercise of clinical autonomy among PONs (context) to provide a high level of compassion (mechanism) when completing standardised interventions (i.e., care protocols, checklists), leading to adequate individualised care in patients' clinical preparation (outcome) for patients undergoing surgery [CMO - 6.8].

6.3.2 Inter-professional collaboration and sufficient self-efficacy

The following section explains how inter-professional collaboration and adequate clinical time lead to adequate exercise of clinical autonomy among PONs (context) to provide sufficient self-efficacy (mechanism) when completing standardised interventions (i.e., care protocols, checklists) that leads to adequate individualised care concerning patients' clinical preparation of patients (outcomes) undergoing surgery.

The associate director emphasised that self-efficacy (i.e., good and confident decision making) among PONs can minimise OTDSCs for clinical reasons. However, the associate director argued that the use of pre-assessment protocols (i.e., standardised interventions) helps to minimise OTDSCs, nonetheless emphasising that adequate clinical time, training and inter-professional collaboration helps to improve the clinical autonomy and self-efficacy of PONs, contributing to minimising OTDSCs for clinical reasons.

"It is good and confidence in clinical decision making (mechanism – self-efficacy) by doctors and nurses, especially pre-op nurses [PONs] prevents surgery cancellations [OTDSCs] due to clinical problems. Of course, the pre-assessment protocol helps, but nurses [PONs] need enough clinical time and training (micro-context) to do their job properly (micro-context – clinical autonomy) and confidence (mechanism – self-efficacy) about their clinical judgement is key here [prevents OTDSCs]…"

(Participant 23, Associate Director, p. 17)

The comments from the nurse in charge suggest that adequate clinic time and senior clinical support represent important contexts to prevent OTDSCs for clinical reasons. Senior clinical support can be interpreted as inter-professional collaboration. The nurse in charge also highlighted when PONs used to have good working relationships and support from anaesthetics, the OTDSCs, due to clinical reasons, tended to be very low. A sound clinical decision from the nurse in charge can be interpreted as self-efficacy. Furthermore, the nurse in charge's comments suggest that PONs have most of the required skills, but when completing the protocol, inter-professional collaboration is necessary for individualised care concerning clinical care planning.

"Sometimes, they know their job but need support (micro-context – inter-professional collaboration) from senior clinicians, to complete the protocols (standardised interventions) in comprehensively addressing patients' clinical risks (outcome – individualised care concerning clinical risks)… When we used to have good relationships and support from anaesthetics, the OTDSCs, due to clinical reasons, tend to be very low ..PONs need more clinic time and senior clinical support to make a good sound clinical decision (mechanism – self-efficacy) to prevent this type of cancellation [OTDSCs due to clinical reasons] due to failure to prep patients (outcome – individualisation of care)."

(Participant 27, Nurse in Charge, p. 6)

The senior surgical registrar emphasised that, to prevent OTDSCs, an adequate level of individualisation of care related to clinical preparation is vital. PONs therefore

need to prepare patients considering all the clinical conditions involved, such as co-morbidities, allergies and medication, especially anti-coagulation medication. To achieve this individualisation of care, the senior surgical registrar identified self-efficacy of PONs (i.e., confidence in their decision making) because they play an influential role in preparing patients for surgery. Furthermore, the senior surgical registrar identified conditions such as adequate clinic time and inter-professional collaboration, which appear to influence clinical autonomy positively.

> *"To prevent surgery cancellations [OTDSCs] due to clinical problems (main outcome), what you need is where they [PONs] address all the patient's clinical needs (outcome – individualisation of care concerning clinical care planning) by being confident in their decision making (mechanism – self-efficacy), but they need more time (meso-context) and support from anaesthetists (meso-context – inter-professional collaboration) to do their nursing job (context – clinical autonomy)."*
>
> **(Participant 15, Senior Surgical Registrar, p. 5)**

The quotation suggests that, when delivering care using a pre-operative assessment tool (i.e., standardised clinical care planning intervention), confidence in clinical decision-making of PONs appears to minimise OTDSCs for clinical reasons by improving the individualisation of clinical care concerning clinical preparation. They also identified that adequate clinic time and inter-professional collaboration are vital contexts to positively influence the clinical autonomy of PONs.

Inter-professional collaboration among PONs and anaesthetists leads to adequate exercise of clinical autonomy among PONs (context) to provide sufficient self-efficacy (mechanism) when completing standardised interventions (i.e., care protocols, checklists) that lead to adequate individualised care concerning patients' clinical preparation of patients (outcomes) undergoing surgery [CMO-6.9].

Sufficient clinical time leads to an adequate exercise of clinical autonomy among PONs (context) to provide a high level of self-efficacy (mechanism) among PONs

when completing standardised interventions (i.e., care protocols, checklists). This then leads to adequate individualised care concerning patients' clinical preparation of patients (outcomes) undergoing surgery [CMO-6.10].

6.3.3 Inter-professional collaboration and sufficient clinical time lead to a high level of situational awareness

The following section explains how inter-professional collaboration and adequate clinical time leads to adequate exercise of clinical autonomy among PONs (context) to provide sufficient levels of situational awareness (mechanism) when completing standardised interventions (i.e., care protocols, checklists) that lead to adequate individualised care concerning patients' clinical preparation of patients (outcomes) undergoing surgery.

The surgeon and clinical director's comments highlighted several important points when completing the relevant standardised interventions (protocol): individualisation of care related to clinical care preparation, how inter-professional collaboration influenced behaviours such as self-efficacy and situational awareness. The surgeon and clinical director's comments relate to understanding that the expectations of the anaesthetist can be interpreted as a sufficient level of situational awareness of PONs. In summary, the surgeon and clinical director identified that PONs' behaviours, such as sufficient levels of self-efficacy and situational awareness, appear to drive adequate levels of individualisation of clinical care planning to minimise OTDSCs for clinical reasons.

> *"The problem is too much reliance on the pre-op protocol (standardised interventions) can be harmful… When nurses used to work in the same office with us, they used to have good working relationships and guidance from anaesthetics, the OTDSCs due to clinical reasons, tended to be very low, and we never had these problems…We need a good comprehensive preparation of care (outcome – individualisation of care) in the pre-op protocol… They [PONs] need more time in their developmental support from senior*

anaesthetists (context – inter-professional collaboration) to improve their confidence in their clinical decision making (mechanism – self-efficacy) and understanding of the clinical expectations of anaesthetists and surgeons (mechanism – situational awareness) to prepare patients carefully by addressing their clinical needs."

(Participant 7, Surgeon and Clinical Director, p. 3)

The following section from the interview transcript explains the argument made by the anaesthetist registrar explaining the importance of situational awareness and self-efficacy among PONs in minimising OTDSCs for clinical reasons. Furthermore, they explain how situational awareness of PONs works in practice to minimise OTDSCs for clinical reasons.

The anaesthetist registrar also made an important connection in that having adequate time is a condition that activates behavioural mechanisms (i.e., self-efficacy and situational awareness) among PONs.

Anaesthetist Registrar *– When the pre-op nurses [PONs] do a good job, most of the time you can prevent most of the surgery cancellation [OTDSCs]… It is all about pre-op nurses [PONs] having fairly good clinical time to make sound and confident clinical decisions (mechanism – self-efficacy) and understanding anaesthetist expectations (situational awareness) that can prevent things you talked about (OTDSCs due to clinical reasons).*

Researcher *– Can you tell me more about understanding anaesthetist expectations by pre-op nurses [PONs]? What is it like in practice about understanding anaesthetist expectations by pre-op nurses [PONs]? This sounds like a big expectation from nurses to understand anaesthetists' expectations. Can you give me an example of how it works in practice to prevent on the day of surgery cancellations?*

Anaesthetist Registrar *– So we need to know that the pre-op nurses [PONs] identified the problem and what they have done to reduce the clinical risks or did create a problem somewhere… You have to remember we see the*

patients [for the] first time before the surgery… This could be numerous things from medication management to previous conditions or new clinical conditions…When nurses used to have good working relationships and guidance from anaesthetics, the OTDSCs due to clinical reasons, tended to be very low in our department.

Researcher *– Sorry – just give me a simple example and a practical example, where you explain to a layperson.*

Anaesthetist Registrar *– …So some things like managing anaemia, when the patient is anaemic and the pre-op nurses [PONs] need to know we are interested in anaemic levels before the surgery and throughout the process. So we expect in the pre-op notes [documentation related to pre-assessment] or patient notes that were the anaemic levels before and what they did, they prescribed, and how it comes and what it is now. It is all about nurses [PONs] knowing that we reviewed the patient before the surgery and having all the information we required in the patient notes and pre-op protocol (standardised intervention).*

Participant 28, Anaesthetist Registrar, p. 12)

The anaesthetist registrar highlighted that PONs need to have a level of situational awareness to understand anaesthetists who have reviewed patients before surgery, explaining how the situational awareness of PONs works in minimising OTDSC practice. Answering the researchers' questions, anaesthetists explained in the review before the surgery that they like to see how patients' various clinical risks change during the clinical preparation process. To explain this, the anaesthetist registrar used an example relating to the importance of documenting the anaemic level of patients in different stages before and after surgery for anaesthetists who review patients before surgery. The anaesthetists also highlighted that when PONs used to have good working relationships and guidance from anaesthetics, the OTDSCs, due to clinical reasons, tended to be very low.

In simple terms, this means that clinical decision making including documentation of PONs needs to keep various expectations of the anaesthetist in mind to minimise OTDSCs. This can be interpreted as situational awareness of PONs.

The quotations highlighted that PONs need to have situational awareness of various policies and expectations of anaesthetists when preparing for surgery to minimise OTDSCs for clinical reasons. The quotations also identified that adequate clinic time and inter-professional collaboration are vital contexts to influence the clinical autonomy of PONs positively. Inter-professional collaboration among PONs and anaesthetists leads to adequate exercise of PON clinical autonomy (context) to provide a high level of situational awareness (mechanism) when completing standardised interventions (i.e., care protocols, checklists) that lead to adequate individualised care concerning patients' clinical preparation of patients undergoing surgery [CMO-6.11].

Sufficient clinical time leads to adequate exercise of clinical autonomy among PONs (context) to provide a high level of situational awareness (mechanism) when completing standardised interventions (i.e., care protocols, checklists) that lead to adequate individualised care concerning patients' clinical preparation of patients undergoing surgery [CMO-6.12].

6.3.4 Summary of CMOCs explaining the contexts for minimising OTDSCs

The CMOCS explain that minimising OTDSCs for clinical reasons are summarised in the table below.

No.	Context	Mechanism	Outcome
CMO 6.08	High level of clinical autonomy among PONs because of inter-professional collaboration between anaesthetists and PONs →	High level of compassion among PONs →	

No.	Context	Mechanism	Outcome
			Adequate levels of individualised clinical care planning or clinical readiness
CMO 6.09	High level of PON clinical autonomy because of inter-professional collaboration between anaesthetists and PONs	High level of self-efficacy among PONs	
CMO 6.10	High level of clinical autonomy among PONs because of sufficient time for clinical consultation	High level of self-efficacy among PONs	
CMO 6.11	High level of clinical autonomy among PONs because of inter-professional collaboration between anaesthetists and PONs	High level of situational awareness among PONs	
CMO 6.12	High level of clinical autonomy among PONs because of sufficient time for clinical consultation	High level of situational awareness among PONs	

Table 6.3-1Summary of CMOCs and how to minimise OTDSCs resulting from tension between standardisation and individualisation of care.

6.4 Synthesis of the programme theory (RQ3)

OTDCSs are complex and fluid, context-sensitive, undesired outcomes, which create significant problems for patients and organisations. OTDSCs for clinical reasons appear to be linked to NHS policies, organisational contexts and various behaviours of patients and HCPs. However, the analysis suggests that, for clinical reasons, OTDSCs can be minimised in HDSs.

The analysis suggests that PONs play a vital role in minimising OTDSCs. When PONs prepare patients by identifying their individualised clinical care needs before they are admitted to hospital, they provide an important part of care delivery to minimise OTDSCs. Chapter 5 validates the taxonomy developed in the IPT development phase and explains different aspects of the individualisation of care, which appear to provide the context to different types of OTDSCs (section 5.4.1 to 5.4.3). In contrast, different aspects of adequate individualisation of care appears to minimise different categories of OTDSCs. Section 5.4.2 highlights that adequate individualisation of care in clinical care planning tends to enable trust among anaesthetists about clinical readiness when they review patients before they are admitted to surgery. This is vital to minimising OTDSCs for clinical reasons.

In essence, based on the patient community the hospital serves, the level of individualisation of care needs to be addressed by PONs can varies significantly. For example, community hospitals may carry out simple day-case surgery. On the contrary, university hospitals tend to carry out complex surgeries that require multiple surgeons and other specialist staff. Despite various aspects of individualised care needs, SSCSs heavily rely on standardisation of care (pre-operative protocols, checklists and standard clinic time). As with the level of individualisation of care, the extent of standardisation of care can vary based on the organisation and policy context in which it operates. However, PONs are expected to address a wide range of patient clinical and socio-economic needs using standardised interventions, including standard clinic times. It could therefore be argued that, in HDSs, tension exists between standardisation and individualisation of care, which can result in OTDSCs. The analysis suggests that PONs could minimise the tension between the standardisation and individualisation of care using clinical autonomy. However, in NHS hospitals, various policies influenced by organisational contexts and standardisation of care appear to limit clinical autonomy among PONs.

Clinical autonomy of PONs and adequate levels of individualisation of care in clinical care planning provide an important context to minimising OTDSCs. Adequate levels of clinical autonomy of PONs appears to enable behavioural mechanisms that lead

to adequate levels of individualisation of care in clinical preparation: compassion, self-efficacy and situational awareness. Organisational contexts, such as adequate clinical time and inter-professional collaboration (PONs, matrons and anaesthetics), are also important in improving the clinical autonomy of PONs, consequently minimising OTDSCs.

The analysis also suggests that both standardisation and individualisation of care have important advantages to minimise OTDSCs and other undesired outcomes. Similarly, organisations inevitably need to respond to various policies (i.e., austerity measures, performance targets) and external pressures (such as long waiting lists and staff shortages). There is thus no panacea to minimising OTDSCs. However, healthcare organisations can manage the tension between both standardisation and individualisation of care by providing adequate levels of clinical autonomy for PONs, enabling behavioural mechanisms (i.e., compassion, self-efficacy and situational awareness) which lead to adequate levels of individualisation of care in clinical preparation, potentially helping to minimise OTDSCs for clinical reasons.

In summary, based on the analysis of the semi-structured interviews, the following transferable explanations of how to minimise OTDSCs are suggested. To achieve individualisation of care in clinical preparation, it is vital to have adequate clinical autonomy among PONs. Adequate levels of clinical autonomy among PONs appear to create the following behavioural mechanisms: compassion, self-efficacy and situational awareness. Consequently, this leads to adequate levels of individualisation of care in clinical preparation. Adequate levels of individualisation of care in clinical preparation results lead to trust in the clinical preparation of anaesthetists who review patients before surgery and result in minimising OTDSCs. Based on the analysis, providing an adequate level of clinical autonomy for PONs can be vital to start a chain of reactions among various important actors, leading to minimising OTDSCs.

6.4.1 Going beyond the failure or blame

The interview data suggest failure of various processes results in OTDSCs. The word ‘failure’ is frequently used by various professionals (e.g., surgeons, anaesthetists) involved at the end of the clinical pathway that leads to OTDSCs. For example, failure to schedule resources or clinical care planning based on individualisation of care leads to OTDSCs due to resources (theatre time or beds). Sometimes, the failure implied to PONs involved in clinical care planning. It is worth highlighting PONs appear to work hard by overcoming various organisational and system challenges. Unfortunately, it is not common for HCPs in different stages of the care pathway to imply failure of an actor or certain professional group. It is helpful to identify failures in processes but it would be useful to underline that this is not a failure of certain professional groups (i.e., PONs or waiting list administrators, schedulers); in fact, these are system failures where favourable conditions (e.g., interprofessional collaborations, favourable working conditions and training) are not provided for these groups to provide the care they wish to perform.

The thesis emphasised that OTDSCs might be a symptom of a dysfunctional care system, therefore blaming individuals can get this problem worse. Furthermore, it is useful to create opportunities in a multidisciplinary setting to learn from these incidents that are considered “failures”. In practice, providing favourable working conditions for groups in clinical care planning and scheduling might lead to various aspects of high individualisation care and minimising OTDSCs.

6.5 Chapter Summary

This chapter continues the refinement of IPT 1 using 28 semi-structured interviews. Building on the previous chapter's analysis (Chapter 5), it develops CMOCs to explain the creation and minimisation of OTDSCs.

Section 6.2 in this chapter explains how, why and in what contexts OTDSCs emerge by presenting a series of CMOCs. The NHS policy context created unfavourable working conditions for PONs in NHS hospitals, resulting in inadequate levels of clinical autonomy. As a result, PONs’ completion of standardised care planning has

led to low levels of self-efficacy, compassion and situational awareness among PONs and an inadequate level of individualised clinical care planning. Sometimes, this leads to OTDSCs for clinical reasons and because of the unavailability of resources. The CMOCs highlighted that inadequate levels of clinical autonomy among PONs lead to an inability to manage tensions between the standardisation of clinical care planning and individualisation of clinical care, contributing to OTDSCs for clinical reasons.

Section 6.3 highlighted how, why and in what contexts OTDSCs are minimised and presents CMOCs. This section explains how adequate levels of clinical autonomy among PONs lead to high levels of compassion, self-efficacy and situational awareness and adequate levels of individualisation of care. The CMOCs highlighted that adequate levels of clinical autonomy among PONs, enable them to harmonise or manage tensions between standardisation of clinical care planning and individualisation of clinical care.

The analysis highlighted that minimising OTDSCs is a complex problem influenced by various aspects of macro-, meso- and micro-contexts, patients and healthcare professionals' perceptions and behaviours. OTDSCs appear to be linked to NHS policies, organisational contexts (e.g., unfavourable because of emergency interruptions and high workloads) and various behaviours of patients and HCPs, especially PONs. However, analysis of the semi-structured interviews has developed a transferable theory that can be used to minimise OTDSCs for clinical reasons. To achieve individualisation of care in clinical preparation, it is vital for PONs to have adequate clinical autonomy. Adequate levels of clinical autonomy among PONs appears to create the following behavioural mechanisms – compassion, self-efficacy and situational awareness. Consequently, this leads to adequate levels of individualisation of care concerning clinical preparation, resulting in trust in the clinical preparation of the anaesthetist who reviews the patient before the surgery, resulting in minimising OTDSCs. Organisational contexts, involving, for example, adequate clinical time and inter-professional collaboration (PONs, matrons and anaesthetists) can be important in improving the clinical autonomy of PONs.

In the next chapter, IPT 1 is further refined using literature-related OTDSCs.

7 Chapter – theory refinement using literature

7.1 Introduction to the chapter

Chapter 6 used 28 semi-structured interviews to refine IPT one and develop a series of CMOCs. This chapter further delineates these findings by contextualising them within the existing literature, using the five-stage method, as a form of realist synthesis adapted from Pawson (2006, p. 79). The realist investigation consisted of five phases. Moreover, phase four, which this chapter explains. The realist synthesis consists of five stages: defining the scope of the review, searching for relevant studies, quality appraisal, extracting the data and synthesising it.

The scope of the review is based on the findings in sections 6.5 and 6.6. It involved searches completed in three databases: Web of Science, Scopus, and Cochrane. Both the Web of Science and Scopus databases provide an extensive platform of searchable journals from a wide range of disciplines, including applied sciences, social sciences, medicine, operations management and research, healthcare management, nursing, psychology, and multi-disciplinary research. Cochrane (i.e., Cochrane reviews) presents a series of articles on health care and policy that identified, appraised, and synthesised all the empirical evidence that meets pre-specified eligibility criteria to answer a specific research question.

From 5,990 information sources, 20 studies were identified according to the study selection criteria. For all the empirical studies (except the evidence review), the quality was appraised using the MMAT (Hong et al., 2018). For each study, the data was extracted into a table consisting of six columns: reference, title of the study, country, study design, main findings, and how might and should the intervention work (i.e., applying "realist logic"). In the next stage, the extracted data is synthesised to further refine the findings highlighted in Chapter 6.

The selected studies, collected from 11 different countries, further validate that OTDSCs were a complex, context-sensitive and long-standing problem. The studies

identified that OTDSCs, due to clinical reasons, depend on several interconnected variables: standardised interventions for clinical care planning (interventions), individualisation of care concerning clinical care planning, clinical autonomy of PONs (micro-context), which is influenced by organisational contexts (meso-contexts) and policy contexts (macro-context); and behavioural mechanisms, such as confidence in PON clinical decision-making (i.e., self-efficacy). The review process was guided by the RAMESES quality and publication standards for realist synthesis (Wong et al., 2013) and more details can be found in appendix 7.1.1. This chapter is structured based on the scope of the review, search for primary studies, screening process and quality appraisal data extraction, and synthesis (main findings and what the identified literature adds to the refinement process).

7.2 Scope of the review

The scope of the realist synthesis presented in this chapter (phase four) involved further refinement and findings from semi-structured interviews. In line with the definitions and scope of the realist investigation presented in Chapter 2, the realist-informed literature reviewed is also limited to scheduled care surgery and OTDSCs. As such, emergency and semi-emergency surgery cancellations fall outside of this study's remit. All age groups can elect to schedule care surgery, and many patient groups do so, including high-risk groups, such as cancer and cardiology patients. Similarly, the review defines surgery as a medical procedure performed in an OT and limited to planned or scheduled surgery.

7.3 Search for primary studies

The primary search for articles and relevant literature was designed using databases that allowed for transparent and reproducible searches. For this reason, the Scopus, Web of Science, and Cochrane databases were selected. Search strategies were then developed based on the requirements and limitations of each database. Both the Web of Science and Scopus databases provide an extensive platform of journals featuring a wide range of disciplines (as stated above), therefore guaranteeing a comprehensive overview of relevant scholarly information. Cochrane presents a

series of articles on health care and policy that identified, appraised, and synthesised all the empirical evidence that meets pre-specified eligibility criteria to answer a specific research question. Scopus, Web of Science, and Cochrane databases cover clinical, nursing and humanities subjects, including social science. Furthermore, previous work completed in phase two (i.e., development of IPTs) suggests the following three databases are most likely to have the breadth and depth of evidence required for further refinement.

Search terms such as ‘operations’, ‘surgery’, and ‘procedures’ are commonly used descriptors across a range of care settings. As a result, searches tend to produce many studies that may include information and data that are not directly relevant to the research questions. To find the most relevant studies, various filters (e.g., human studies and animal studies, and other subject headings) were used based on their availability.

Depending on which database, search strategies varied slightly due to the phrasing searching, filters, and truncation. The scope of the search is based on the findings in Chapter 6 (sections 6.5 and 6.6); the search considered various terms, such as ‘standard interventions’, ‘surgery cancellations’, ‘individualised care’, ‘autonomy’, ‘compassion’, ‘self-efficacy’, ‘situational awareness’, ‘trust’, and ‘nurse’. As far as possible, search strategies focused on synonymous terms to ensure that all relevant evidence was captured. Several search strategies were developed using advice from information specialists, and these were revised several times to capture a wide range of literature from all identified sources. The searches were limited to human studies and papers published in English since 1999.

On most occasions, the database search is conducted separately in parts to improve the accuracy of the search. For example, the following three searches were conducted in the SCOPUS database focusing on three aspects related to surgery cancellations – standardisation, individualisation, and behaviours (e.g., autonomy, self-efficacy, awareness, and trust) of the refined IPT to identify the relevant articles.

The table 7.3.1 below illustrates the three searches completed. Where necessary, synonymous were used to capture a broadly similar meaning; for example, to capture the overlap between surgery, elective activity, elective procedure and operation.

Scopes of the search	**Search query in SCOPUS**
surgery cancellations and standardisation of care	(TITLE-ABS-KEY ("surg*" OR "elective activit*" OR "elective procedure*" OR "operation*") AND TITLE-ABS-KEY ("cancel*" OR "terminate*" OR "reschedule*" OR "abandon*") AND TITLE-ABS-KEY ("nurse*" OR "decission") AND TITLE-ABS-KEY ("stand*" OR "protcol*" OR "care plan*" OR "pre-ass*")) AND PUBYEAR > 1998 AND PUBYEAR < 2024 AND (LIMIT-TO (LANGUAGE , "english"))
surgery cancellations and individualisation of care	(TITLE-ABS-KEY ("surg*" OR "elective activit*" OR "elective procedure*" OR "operation*") AND ABS ("cancel*" OR "terminate*" OR "reschedule*" OR "abandon*") AND TITLE-ABS-KEY ("individual*" OR "patient-centre*" OR "person-centre*")) AND PUBYEAR > 1999 AND PUBYEAR < 2024 AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (SUBJAREA , "MEDI") OR LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "DECI") OR LIMIT-TO (SUBJAREA , "HEAL") OR LIMIT-TO (SUBJAREA , "PSYC") OR LIMIT-TO (SUBJAREA , "MULT") OR LIMIT-TO (SUBJAREA , "NURS")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (EXACTKEYWORD , "Human"))
surgery cancellations and behaviours	TITLE-ABS-KEY ("surg*" OR "elective activit*" OR "elective procedure*" OR "operation*") AND ABS ("cancel*" OR "terminate*" OR "reschedule*" OR "abandon*") AND TITLE-ABS-KEY ("autonom*" OR "professional*" OR "compassion*" OR "self-efficac*" OR "confidenc*" OR "awareness*" OR "trust*") AND TITLE-ABS-KEY ("nurse*" OR "decission")) AND (LIMIT-TO (LANGUAGE , "english"))

Table 7.3-1 Three scoping searches were conducted in line scope of the study.

7.4 Screening process

This review used transparent and reproducible inclusion and exclusion criteria to screen titles, abstracts, and full-paper screening levels. All database searches were conducted in September 2023. In total, 5,990 articles were retrieved from databases. Table 7.4.1 illustrates the number of eligible articles identified, screened, and included. The key question for screening abstracts was: ‘Could this article provide relevant information to refine the findings related to semi-structured interviews identified in sections 6.5 and 6.6?’. The screening for eligible studies was completed by considering the title and abstract of retrieved articles. Most excluded articles explained cancellations or rescheduling procedures, such as procedures completed in out-patient clinics, radiotherapy treatments, and various diagnostic tests (e.g., X-rays and CT scans).

In the next stage, the identified eligible papers were reviewed against the same criterion to find relevant information. Most excluded studies discuss surgery cancellation as a problem, or its impact or prevalence, but did not provide enough information about patterns or trends of interventions that were used or could be used to influence OTDSCs. Most of the excluded studies were single-centre descriptive retrospective studies that report the prevalence or impact of surgery cancellations at a hospital site or a clinical speciality. Some of the eligible studies were identified earlier in phase two as part of the IPT development. As a result, these studies were excluded from theory refinement. Based on the exclusion and inclusion criteria, 20 studies were identified.

	Scopus	**Web of Science**	**Cochrane Library**	**Total**
Identification	569	3524	1897	5990
Screening	569	3524	1897	5990

Eligibility	68	78	0	146
Included	11	9	0	20

Figure 7.4-1 summarises PRISMA flow diagram.

7.5 Quality appraisal

The quality appraisal process in a realist review is different from that in a traditional systematic review (Pawson and Tilley, 1997b; Pawson, 2006b). Systematic reviews tend to be method-driven, while realist synthesis is theory-driven (Jagosh, 2019; Pawson and Tilley, 1997b). Method-driven reviews rely on the quality and trustworthiness of primary evidence concerning a methodological hierarchy or hierarchy of evidence. For example, qualitative research is ranked lower, and priority is given to experimental and quasi-experimental design (Jagosh, 2019). Realist reviews largely reject this hierarchy of evidence and instead use varied data sources to gain insights into interventions (Pawson, 2006b). The realist principle is encapsulated by Pawson's thought-provoking headline that "even bad research can yield good evidence" (Pawson, 2006a). As part of a realist evaluation, studies are assessed for their rigour and relevance (Wong et al., 2013). Relevance is associated with the extent to which the study contributes to developing, refining, or testing programme theory. Rigour is concerned with the trustworthiness of the element of the study of interest to the programme theory (Pawson, 2006a). Many global clinical and management disciplines have contributed to the rich literature on surgery cancellation. The objective of the realist review is to retain this richness and obtain a multi-stakeholder view. All the empirical studies (except the evidence review), were appraised using MMAT (Hong et al., 2018) (see Appendix 7. 4.1). However, the review does not exclude any studies based on quality alone.

7.6 Data extraction and synthesis

For each study, the data was extracted into a table consisting of the following columns: reference, title of the study, country, study design, main findings, and how might and should the intervention/findings work to influence OTDSCs (i.e., applying

"realist logic"). The information related to how might and should the intervention/findings work was usually found in the discussion sections. Table 7.6-1 summarises the data extraction of all the identified studies.

The primary focus of the synthesis is to understand how to refine (i.e., validate, refute, or expand) the findings from the semi-structured interviews highlighted in sections 6.5 and 6.6. The data synthesis was an iterative process consisting of a multi-stepped approach to identifying dyads and triads related to IPT one. The preliminary analysis was inductive, classifying content into abstract categories includes various dyads and triads related to IPT one using the ICAMO heuristic tool (see section 3.4.4). The synthesis validated most of the findings of the semi-structured interview. The synthesis ability to develop CMOCs are based on the availability of relevant evidence and resources. However, synthesis failed to validate the CMOCs due to the unavailability relevant information.

Reference	Title of the study	Country	Study design	Main findings	overview how the intervention might work (i.e., applying "realist logic").
(Björn et al., 2017)	The opportunities and obstacles nurses have in carrying out their work–A case study in an operating department in Sweden	Sweden	A descriptive case study design. The case study comprises structured individual and group interviews with actors in pre-operative care, such as nurse managers, registered specialist nurses and assistant nurses.	When preparing patients for surgery, due to incongruence processes/procedures and various obstacles, the nurses were often unable to deliver care based on their daily working goals. The study summarises performance obstacles in the following categories: workplace resources, unclear daily goals, design of the premises, and influence over their clinical work. The nurses had very little influence on their working environment and work (inadequate level of clinical	When preparing patients for surgery, using various standardised interventions, the PONs or similar roles appear to be struggling to exercise their clinical autonomy. The study highlighted nurses' (similar to PONs) clinical autonomy is negatively influenced by various organisational and working contexts. Consequently, it might lead to undesired outcomes in SSSCs, including OTDSCs, due to clinical reasons.

				autonomy), which has negatively contributed to care delivery or daily work. To achieve the desired outcome in OT, it is vital that nurses involved in pre-operative care have favourable working conditions to carry out the daily routine.	
(Brazil et al., 2021)	Acute hospital preoperative assessment redesign: streamlining the patient pathway and reducing on-the-day surgery cancellations	UK	Redesign the scheduled preoperative pathway between the time a patient was added to the elective surgery waiting list to the day of surgery. Quantitative	A series of standardised interventions include early pre-operative assessment, triage and streamlining, in-clinic support from other HCPs (i.e. prescribing pharmacist and anaesthetist), a standardised outcome form documenting specific patient requirements needing action when a surgery date was agreed, surgery dating only on confirmation of	The study demonstrates interventions designed standardised and interlinked with patient-centred care (individualisation of care), preparing the patient for surgery appears to minimise OTDSCs. Most of the interventions appear to improve the patient-centred care. The one-stop clinic appears to create the context of inter-professional collaboration

			non-randomised study with pre and post-analysis	patient optimisation, a central administrative office (hub) with a patient hotline. The package of 17 interlinked interventions to manage patients in SSCS is based on the principles of standardisation, inter-collaboration between the professionals (i.e., prescribing pharmacist and anaesthetist, PONs), centralisation, and patient-centred care have appeared to achieve a sustainable reduction in OTDSCs. A key enabler was a single, one-stop clinic. Ten months post-implementation presented a near-elimination of OTDSCs for patients assessed in the redesigned service.	(anaesthetists and PONs), which appears to minimise OTDSCs. It is likely administrative hub also relieves the workload of PONs, giving time and clinical autonomy to activate behaviour to make clinical decisions. The study highlighted how standardisation, individualisation of care, creating right organisation contexts, engagement PONs and inter-professional collaboration can minimise OTDSCs

(Chang et al., 2014)	Case review analysis of operating room decisions to cancel surgery	China	Retrospective review of all scheduled surgical procedures for the years 2006–2011. Quantitative study with no intervention implemented.	41% of surgery cancellations were for other than medical or clinical reasons. Almost half of the surgery cancellations were not due to medical reasons and were preventable by better administrative and surgical planning and better communication with the patient and carers. Improving pre-operative care can play a vital role in minimising OTDSCs.	Most OTDSCs are preventable. Improving pre-operative care by addressing clinical and communication issues is vital to minimise OTDSCs. OTDSCs and types of cancellations appear to be closely linked with organisational and patient contexts. Therefore, it is vital to understand the local contexts and use evidenced-based approaches for different types of categorisation of OTDSCs.
(Denholm et al., 2020)	Bioethics: cancelling patient operation	UK,	Evidence narrative/commentary paper that discusses various ethical aspects of OTDSCs	Safe and fair clinical practice means there will always be a need for OTDSCs, especially for clinical reasons. The clinical autonomy of HCPs and patient-centred care are important interconnected variables that can minimise	Trust between the patient and clinicians has been identified as an important part of the care, which might be linked to OTDSCs. The paper highlighted the clinicians acting with autonomy and as professionals rather than

				OTDCSs, especially due to clinical reasons.	“technicians” to minimise OTDSCs and relieve patients' suffering. OTDSCs, due to clinical reasons are ethically justifiable important safety measures used by clinicians. Therefore Patient-centred care and clinical autonomy among HCPs are important to minimising OTDSCs.
(Díez-García et al., 2023a)	Effectiveness of nurse-led Preoperative Assessment for Anaesthesia: A Prospective Cohort Study	Spain	Prospective cohort study. Quantitative non-randomised study with pre and post-analysis among two cohorts	This study evaluated the effectiveness of preoperative in low-clinical complexity surgical patients. Assessment/processes carried out by nurses with formal postgraduate training compared to that carried out	The study highlighted that failure to address various diverse patient needs (individualised care) leads to OTDSCs despite who performed the surgical preparation. Patient education helped reduce the anxiety and fears and improve the trust among patients. The study highlighted how standardisation

				by anaesthetists with regard to OTDSCs and adequate surgical preparation. Cancellations of surgery were the same in both cohorts - 3.8% and 2.6%. Both the PONs and anaesthetists were given a standard clinic time of 20 minutes. Inadequate patient preparation occurred in both cohorts, influencing OTDSCs due to clinical reasons. Poor preparation varies significantly use of substances (i.e., cannabis, cocaine) to various cosmetic treatments.	of care and preparing patient for surgery can minimise OTDSCs
(Dowd et al., 2023)	Education for registered nurses Completing	USA	An educational module was created for registered	Knowledge and confidence increased but were not statistically significant, although several interview	The connection between the improving confidence in nurses' decision-making and OTDSCs. The standardised approaches to

	Preoperative Anesthesia Interviews: A Quality Improvement Project		nurses completing preoperative anaesthesia interviews (i.e., preparing patient for surgery). Pre- and post-implementation data was collected.	components within pre-operative assessment and documentation improved with statistical significance. Overall Day of surgery cancellations, although not statistically significant, were found to decrease. Registered nurses' knowledge, confidence and standardised clinical care planning intervention completeness improved after completing the educational module with anaesthetic considerations, providing a number of additional outcomes patient optimisation, improved patient outcomes, and reduced patient and organisational costs.	pre-operative care might be able to minimise OTDSCs.

(Elkassabany et al., 2013)	Preoperative Screening and Case Cancellation in Cocaine-Abusing Veterans Scheduled for Elective Surgery	US	A quantitative descriptive study where chiefs/head of the anaesthesia departments in the veterans affairs health system were surveyed to estimate how often they encounter and manage surgical patients with cocaine use.	Over half (52%) of the Veterans Affairs anaesthesia departments encounter, at least once per week, cocaine-abusing veterans scheduled for elective surgery. About two-thirds of the Veterans Affairs would cancel patients surgery if they tested positive for cocaine (65%). The decision to cancel surgery related to the use of cocaine varies based on various contextual factors: clinician's perception, organisational, and individual anecdotes. There is a general consensus that formal standards or guidelines would be helpful.	OTDSCs related to cocaine use could have been prevented by individualising care related to care planning and communication. The case also demonstrates OTDSCs related to cocaine, which can be categorised as clinical reasons for OTDSCs depend on various meso, macro and micro contexts and the perceptions of HCPs influenced OTDSCs.
(Ellis et al., 2012)	Preoperative assessment	UK	Pre- and post-evaluation of	The study evaluated the development of a nurse-led	Elderly patients tend to have complex clinical and

	in the elderly: Evaluation of a new clinical service		series of intervention	preoperative assessment for elderly patients. The intervention managed to reduce length of stay from 8.9 to 4.9 days after the introduction of the pilot (P = 0.001). Delays were lowered from 9.9% to 2.3% (P= 0.004) and fewer procedures were cancelled at pre-assessment (17.7% before, 5.2% after; P= , 0.001). Serious postoperative complications were reduced from 8.5% to 2.3% (P= 0.01).	interconnected clinical needs. However, multidisciplinary, standardised, proactive pre-operative assessment helps to avoid unnecessary undesired outcomes such as delays to surgery, reduced postoperative complications and reduced length of stay. The study appears to demonstrate standardisation, inter-professional collaboration and identifying patient needs can minimise a series of undesired outcomes and increase desired outcomes (e.g., LOS)
(Gaucher et al., 2016)	Assessment of a standardized pre-	France	Multicentre, two-arm, parallel-group, open-label	The study population comprised 3,900 patients: 1,950 each randomised to the checklist arm and the control	A standardised pre-operative telephone checklist did not avoid late cancellations (OTDSC) of ambulatory surgery but enabled

	Operative telephone checklist designed to avoid late cancellation of ambulatory surgery: The AMBUPROG multicentre randomized controlled trial		randomized controlled trial. The RTC was completed among 11 university hospital ambulatory surgery units in Paris, France.	arm. This study defined late cancellation as the day before or on the day of surgery. The rate of late surgery cancellation did not differ significantly between the checklist and control arms (109 (5.6%) vs. 113 (5.8%), adjusted odds ratio [95% confidence interval] = 0.91 [0.65–1.29], (p = 0.57)). Checklist administration revealed that 355 patients (28%) did not undergo tests ordered by the surgeon or anaesthetist and that 254 patients (20%) still had questions concerning the fasting state.	us to identify several frequent causes. The intervention mainly focuses on clinical aspects and does not acknowledge the importance of the psychological and emotional aspects of surgical care. The standardised interventions used alone do not minimise the OTDSCS. It might be the individualisation of care needs were not met by the standardised interventions.

(Gilmartin and Wright, 2008)	Day surgery: patients' felt abandoned during the preoperative wait	UK	Qualitative study. Data was collected by using unstructured interviews.	The themes that emerged from the data are highlighted: the patients going through surgery varies significantly. The study demonstrates that the majority of the patients felt abandoned in the preparing for surgery or preoperative stage, and PONs did not recognise the importance of ongoing psychological support. There is also a need to be aware that environmental factors can impact patient anxiety.	The analysis indicated the importance of managing individual communication and emotional needs to minimise undesired outcomes such as negative patient experience (i.e., abundant during the surgery) and anxiety. Although it is not clear from the study, it is possible the nurse may not have enough time or autonomy to manage patients individualised communication or emotional needs. The study also highlighted that inadequate preparation of patients undergoing surgery is common in the UK NHS.
(Hines et al., 2015)	Effectiveness of nurse-led preoperative	Australia	Systematic review update focused on the	The study proposed there needs to be stronger evidence to suggest nurse-led	The findings suggest that pre-operative preparation of patients' surgery by pre-

	assessment services for elective surgery: a systematic review update		effectiveness of pre-operative care given by nurses	preadmission services may be an effective strategy for reducing procedural/surgery cancellations and failure to attend for surgery/procedures, due to lack of randomised control trials. Similarly, weak evidence suggests that nurse-led preadmission services may improve patient preparation. Nurse-led preadmission/pre-operative services may effectively reduce procedural cancellations, failure to attend to procedures/surgery, and patient anxiety; however, the current evidence level is low.	operative assessment consisting of standardised interventions can minimise OTDSCs due to clinical and patient-initiated reasons. Furthermore, PONs or similar roles and behaviours play an important role in preparing patients based on their needs and minimising OTDSCs. The systematic review highlighted the influential role played by the nurses to minimise OTDSCs due to clinical reasons.
(Jiménez et al., 2006)	Cancellations in ambulatory day surgery: Ten years	UK	A descriptive quantitative study and no	The main reasons for surgery cancellation were acute medical conditions, personal decision of the patient to	Improving pre-operative care is vital to minimise OTDSCs, especially for clinical reasons. The standardised approaches

	observational study		clear intervention	refuse, failure to follow pre-operative guidance and unavailability of resources. Over half of the cases of OTDSCs could be prevented. Improving and implementing pre-operative assessment guidelines must be considered as one of the ways to minimise OTDSCs. In addition to that, the study highlighted the awareness of the cost related to OTDSCs and the rapid response of surgical departments to substitute patients.	can help improve the consistency and comprehensiveness (i.e., addressing various clinical issues) of clinical care planning, leading to minimising OTDSCs for clinical reasons.
(Leite et al., 2019b)	Reducing Preventable Surgical Cancellations : Improving	USA	Pre- and post-evaluation of series of intervention	A standardised preoperative interview guideline and online educational modules for nurses conducting pre-operative interviews improved	The standardised interventions in pre-operative care appear to have managed to minimise OTDSCs.

	the Preoperative Anaesthesia			preoperative record completion rates, reduced avoidable laboratory testing, and minimised OTDSCs. The number OTDSCs was significantly decreased to 20% postimplementation (P= 0.05)	
(Miri Bonjar et al., 2019)	Impact of the health transformation plan on the number of surgical operations and their cancellation	Iran	Comparative Retrospective study conducted in 2 tertiary public hospitals. Quantitative non-randomized study	Important factors affecting the surgeries' cancellation are patients' age, hospital admission type, kind of health insurance, and type of surgery. Outpatient service referrals reduced the probability of cancellations by 50% (odds ratio [OR] = 0.5; confidence interval [CI]: 0.43-0.62). Outpatient service referrals decreased the cancellation rate significantly. This might be that these patients get	Improvement in preparing patients during the surgery influenced surgical operations and their surgery cancellation. The ability to prepare patients for surgery by addressing their clinical needs was important to minimise OTDSCs. The study was conducted in a deprived area where patients need to travel between 200km and 700 km, which may lead to OTDSCs due to patient and clinical

				adequate pre-operative care or preparation for surgery. Comparably, the inpatient cases were 50% more likely to cancel their operation than others (OR = 1.5; CI: 1.36-1.77). This suggests patients with complex clinical needs are most likely to cancel on the days as their patient needs are unlikely to be met.	reasons. Various contextual factors such as travel distance and deprivation of the area, might affect the OTDSCs.
(Rai and Pandit, 2003)	Day of surgery cancellations after nurse-led pre-assessment in an elective surgical	UK	Quantitative descriptive. The study analysed data over the first 2-year period were admitted to ward.	There were 137 cancellations (5.0%) on the day of surgery despite pre-assessment. The three main causes of cancellations in our study on the day of surgery were lack of theatre time, the operation no longer judged necessary, and hypertension.	Preparing patients for surgery using standardised approaches is important in minimising cancellations on the day of surgery and reducing the number of patients transferred to other hospitals. Failure to identify various clinical risks and issues (hypertension, Varicose

	centre: the first 2 years				veins etc.) leads to OTDSCs due to clinical reasons. On some occasions, clinical decisions related to conditions (i.e., hypertension) may vary. The study used a subjective and fragmented categorisation of OTDSCs, making interpreting results difficult. The study validated interprofessional collaboration (i.e., involvement in pre-operative care) between the surgeons, anaesthetists and PONs provide important conditions to minimise OTDSCs.

(Schretlen et al., 2021b)	Reducing surgical cancellations: a successful application of Lean Six Sigma in healthcare	Netherland	Quantitative non-randomized. Two-phase observational study with pre- and post-evaluation to understand the effect of a specific intervention in a real-world setting without randomisation or control group.	Several interventions focused on SSCS have reduced last-minute cancellations (i.e., OTDSCs) were reduced by 50% (p=0.010) plus achieving additional outcomes including €1.15M additional revenue. One of the interventions is creating a one-stop clinic and introducing standardised intervention to improve the completeness of pre-operative preparation. Creating a one-stop clinic improves the interprofessional collaboration among PONs, physicians, and anaesthetists. Crucial success factors were using a structured data-driven problem-solving approach, focusing on patient needs and including process	The findings of the study validate the preparation for patients before the surgery in line with their clinical needs (individualisation of care), and comprehensiveness of the documentation is vital to minimise OTDSCs. Furthermore, highlighted validated interprofessional collaboration provide important condition to minimise OTDSCs

				flow—the leadership support and engagement of involved healthcare professionals through the entire care pathway.	
(Sillero-Sillero and Zabalegui, 2020)	Analysis of the work environment and intention of perioperative nurses to quit work	Spain	A cross-sectional study aimed at nurses working in the surgical area of a Spanish public university hospital using a quantitative questionnaire,	The study reported that the PONs who worked in perioperative surgical care environments had reported a high prevalence of intention to abandon their work due to the lack of personnel and resources, dissatisfaction and emotional exhaustion. In general, 20% of PONs would want to quit their work, which appears to impact quality and interprofessional collaboration directly.	Similar to the refined PT, the PONs appear to be under significant pressure due to an unfavourable working environment affecting quality of care(i.e., preparing patients for surgery)
(Varughese et al., 2013)	Using quality improvement	USA	Pre- and post-evaluation of a	This improvement project/study aimed to increase	The inter-collaboration between the Nurse Practitioners (similar

	methods to optimize resources and maximize productivity in an anaesthesia screening and consultation clinic		series of interventions. Non-randomised quantitative study	the percentage of patient pre-operative screening conducted by Nurse practitioners to 50% within six months. After the implementation of a series of interventions, the percentage of successful nurse practitioners who assisted in pre-operative consultation screenings increased from 0% to 65% over a period of 6 months. There were no significant changes in overall operating room delays and cancellations on the day of surgery.	to PONs) and clinicians appears to improve the nurse practitioners' competency and confidence in decision-making to prepare patients for surgery. Furthermore, the mentoring program with clinicians further strengthens the pre-operative care process.
(Viftrup et al., 2020)	Surgery cancellation: A scoping review of	Denmark	The scoping review was undertaken	Surgery cancellation appears to provide significant harmful emotions consisting of negative effects on patients.	Providing relevant information and identifying vulnerable patients is vital to minimise negative emotions.

	patients' experiences		to understand patients' experiences of surgery cancellation to gain knowledge of nursing care need	Patients appear to prefer sufficient information about cancellation from the surgeon. Four topics were identified: Initial reactions to cancellation, Reactions during a new waiting period at home and during readmission to the hospital, information about cancellation' and the experience of new practical arrangements. The surgery cancellation impacts on trust of the patients in healthcare systems.	Negative feelings due to surgery cancellation could result in mistrust in the healthcare system among patients, which might lead to fear of further OTDSCs. The surgery cancellation could result in mistrust in the healthcare system. It is vital to minimise OTDSCs where possible and support patients undergoing surgery cancellations.
(Xue et al., 2013)	Dynamics of Elective Case Cancellation for Inpatient and Outpatient in	USA	Descriptive quantitative study with no intervention	OTDSCs rate, in general, was 7.5%, among which inpatients have the highest cancellation rate of 18.1%, followed by outpatients at 4.6%, and same-day admission at the lowest cancellation rate of 2.0%. Most	It appears inpatients who have complex clinical needs are more likely to cancel due to the organisation's failure to address their clinical needs. In comparison, less clinically complex patients are less likely

	an Academic Centre			(59.2 ± 8.9%) of the OTDSCs were considered preventable. The top 3 reasons for cancellation include inadequate preoperative preparation 29.4 ± 4.5%, medical condition change 28.5 ± 10.2%; and scheduling issues 20.2 ± 7.1%. The cancellation rate in the ambulatory surgical centre was 5.1%. Inpatients have the highest cancellation percentage associated with inadequate preoperative preparation and scheduling, which could be minimised by implementing early evaluation and preparation. Most of the case cancellations in the	to undergo OTDSCs due to clinical reasons. However, the less clinically complex patients are more likely to undergo cancellation due to patient reasons this might be a failure to individualised care concerning communication reasons.

				ambulatory surgical centre are from patient no-show,	

Table 7.6-1 summaries data extraction table

7.7 Summary of the studies

The identified literature highlighted studies from various healthcare settings and populations, including veteran hospitals, university hospitals and district general hospitals. The identified studies (n=20) used several study designs. Table 7.7.1 categorises the study based on the study design.

Study design	Summary
Quantitative study with none-randomised controlled trial	**8**
Quantitative studies	**6**
Qualitative study	**2**
Mixed method studies	**0**
Systematic/scoping/narrative/ meta-review	**3**
Quantitative Randomised controlled trial	**1**
Total	**20**

Table 7.7.1 Study design of the 20 identified studies.

The study design was identified based on the appraisal tool MMAT. Most of the studies identified quantitative non-randomised control trials, where a series of standardised interventions mostly related to clinical care planning or communication evaluated before and after using quantitative observations (n=8). The second-highest study design consisted of six quantitative studies, most of which consisted of descriptive studies that reported OTDSCs. Among the 20 identified studies, only two were qualitative studies (Gilmartin and Wright, 2008; Björn et al., 2017) and one quantitative randomised controlled trial (Gaucher et al., 2016).

The heterogeneous literature from 11 countries highlighted OTDSCs as a common and long-standing problem that creates suffering for patients and carers and creates significant waste in healthcare systems. Among the 20 studies, most of the studies were from the UK (n=6) and USA (n=5), with two studies were from Spain (n=2), and there was one study each from the following six countries: the Netherlands, Denmark, Iran, China, France, and Australia.

7.8 Main Findings

The OTDSC literature is heterogeneous in nature, from different geographical and healthcare settings, such as district general, veteran hospitals and university hospitals. Some studies focused on elderly care (Ellis et al., 2012); others focused on veterans (Elkassabany et al., 2013) or adult care (Gilmartin and Wright, 2008) or both adult and paediatric care (Gaucher et al., 2016). Some studies are limited to a local hospital or part of it (Rai and Pandit, 2003), while others focus on several hospital sites (Miri Bonjar et al., 2019). Despite the heterogeneous nature, carefully synthesising evidence suggested that there are underlying common themes related to OTDSCs, especially OTDSCs, due to clinical reasons.

OTDSCs create significant suffering by increasing patient anxiety and fear (Viftrup et al., 2020). OTDSCs also create a significant loss of revenue and create waste for hospitals (Schretlen et al., 2021; Xue et al., 2013). However, minimising OTDSCs can reduce waste and improve revenue (Schretlen et al., 2021). Most studies identified that, despite their complexity and high prevalence, OTDSCs are largely preventable (Schretlen et al., 2021; Hines et al., 2015). Most studies highlighted that PONs or nurses in similar roles (e.g., nurse practitioners, registered surgical nurses, pre-operative surgical nurse practitioners) have played an important role in preparing patients for surgery to minimise OTDSCs.

Many studies indicated how OTDSCs are influenced by various interconnected variables, including meso, macro and micro contexts and the perceptions of HCPs (Schretlen et al., 2021; Miri Bonjar et al., 2019). The use of cocaine abuse among patients undergoing surgery can lead to OTDSCs for clinical reasons and is a good example of how various meso, macro and micro contexts and the perceptions of HCPs influenced OTDSCs due to clinical reasons (Elkassabany et al., 2013). However, the decision to cancel surgery for patients involved in cocaine abuse appears to depend on national and regional policy and legal frameworks, organisational policy and the perception of a clinician or team (Elkassabany et al., 2013). Several studies highlighted how PONs or similar nursing roles are negatively influenced by various unfavourable organisations conditions (Björn et al., 2017;

Sillero-Sillero and Zabalegui, 2020), which could influence various undesired outcomes, including OTDSCs.

Most studies used various standardised interconnected interventions to improve the clinical care preparation of patients, to minimise OTDSCs due to clinical reasons (Miri Bonjar et al., 2019; Rai and Pandit, 2003; Schretlen et al., 2021). Preparing patients for surgery using standardised clinical care planning interventions helped to identify and manage patient clinical needs and might help to improve comprehensiveness and individualised clinical care planning, and consequently minimise OTDSCs (Díez-García et al., 2023; Schretlen et al., 2021; Leite et al., 2019; Jiménez et al., 2006). Most studies appear to rely on standardised interventions aimed at pre-operative care to minimise OTDSCs due to clinical and patient-initiated reasons. However, there were very little details pertaining to how and why contexts minimised OTDSCs. The randomised controlled trial sample was relatively large in both arms of the study (n=3900), but, the rate of late cancellations did not differ significantly between the checklist and control arms, which indicated that standardised interventions (i.e., pre-operative telephone checklist) alone did not manage to minimise OTDSCs (Gaucher et al., 2016). It might be that various actors' behaviours and contextual factors influenced the desired outcome of the standardised intervention.

Trust between patients and clinicians has been identified as an important part of care, which might be linked to OTDSCs (Denholm et al., 2020; Díez-García et al., 2023). Further OTDSCs could result in mistrust in the healthcare system among patients (Viftrup et al., 2020). The nurse's confidence in decision-making in preparing patients for surgery appears to influence the level of preparation for surgery concerning clinical care planning, which results in OTDSCs due to clinical reasons (Dowd et al., 2023). The inter-collaboration between the Nurse Practitioners (similar to PONs) and clinicians appears to improve the nurse practitioners' competency and confidence in decision-making to prepare patients for surgery that might minimise OTDSCs due to clinical reasons (Varughese et al., 2013).

These interconnected interventions need to create various aspects of individualised care, as well as standardisation (Schretlen et al., 2021b; Brazil et al., 2021). Some studies mentioned the importance of patient-centred care (Denholm et al., 2020; Brazil et al., 2021; Schretlen et al., 2021b), which can be interpreted as similar to the concept of individualisation of care. The evidence might indicate a link between the OTDSCs and individualisation of care or patient-centred care.

The autonomy of HCPs plays an important role in patient-centred care and minimising OTDSCs (Denholm et al., 2020). In other words, there is an interconnection between the autonomy of HCPs and patient-centred care to minimise undesired outcomes such as OTDSCs or improve quality (Denholm et al., 2020). The studies from several countries (Spain, UK, and Norway) highlighted that PONs appear to be under significant pressure due to an unfavourable working environment affecting their routine care delivery, consequently affecting the quality of care (i.e., preparing patients for surgery, patient experience) (Sillero-Sillero and Zabalegui, 2020; Gilmartin and Wright, 2008; Björn et al., 2017).

An interconnected series of standardised clinical care planning and communication interventions appears to minimise OTDSCs by improving comprehensiveness and consistency. Indeed, various approaches to improving interprofessional collaboration have been able to minimise OTDSCs, especially due to clinical reasons. For example, a one-stop multi-disciplinary clinic between the PONs and anaesthetists (Brazil et al., 2021), and mentoring by anaesthetists (Varughese et al., 2013)

7.9 Limitations of OTDSCs literature

The ability to address the research questions, develop CMOCs and refine theory in the evidence review was based on the availability and richness of the literature. Different studies identified several key contexts – policies, workload, inter-professional collaboration and clinical autonomy of PONs and behaviours (i.e., trust and confidence) that influenced OTDSCs or OTDSCs due to clinical reasons.

Several studies highlighted that improving clinical care planning (pre-operative care) can lead to minimised OTDSCs or OTDSCs due to clinical reasons (Miri Bonjar et al., 2019; Rai and Pandit, 2003; Schretlen et al., 2021). However, the identified evidence from the literature is descriptive and atheoretical and did not provide clear interconnections on how standardised interventions, surrounding contexts, or actors' behaviours (i.e., mechanisms) can lead to outcomes for developed CMOCs. One of the biggest limitations was that the studies failed to categorise OTDSCs meaningfully and objectively. Consequently, this lack of definition makes it difficult to link concepts such as individualisation of care concerning clinical care planning and OTDSCs due to clinical reasons.

One systematic review explores the effectiveness of nurse pre-operative assessment services and found that the evidence is weak due to a lack of randomised controlled trials (Hines et al., 2015). Apart from a systematic review related to the effectiveness of nurse pre-operative assessment services, the search also failed to identify any systematic reviews or realist synthesis that aimed at minimising OTDSCs. The search failed to identify any economic impact analysis, cost, or finance studies related to OTDSCs.

Most studies appear to be interested in the use of a series of standardised interventions in pre-operative care and their ability to minimise OTDSCs (Miri Bonjar et al., 2019; Schretlen et al., 2021b; Leite et al., 2019) but failed to identify how structure and agency interplay (i.e., behaviours and perceptions) or affected various behaviours and outcomes to influence OTDSCs. Similarly, there was evidence that might suggest the link between the individualisation of care and OTDSCs. However, it failed to explain how and what aspects of individualisation of care/patient-centred care influenced OTDSCs due to clinical reasons. Therefore, it is difficult to identify fragments of evidence to develop dyads or triads to develop CMOCs related to standardised interventions.

The studies used different definitions to identify surgery cancellations such as surgery cancellations (Leite et al., 2019), elective case cancellations (Xue et al., 2013) and on-the-day surgery cancellations (Rai and Pandit, 2003). However, some studies failed to provide clear definitions. Another significant limitation in the OTDSCs literature is the varied categorisation of OTDSCs, making it difficult to synthesise transferable theories and refine the findings highlighted in Chapter six. Consequently, this limits the ability to developing meaningful CMOCs or transferable theories from the literature.

Although OTDSCs are a long-standing and common problem, in most healthcare systems, OTDSCs have failed to gain the attention required from the research communities to focus on how and why OTDSCs occur and how to minimise OTDSCs. Furthermore, most studies appear to be quantitative, and only two qualitative studies were identified. The searches were unable to find qualitative studies using ethnographic, multi-case study approaches related to OTDSCs. As highlighted, OTDSCs are a complex, fluid, and context-sensitive global challenge, and it would therefore be helpful to have a good mixture of qualitative, quantitative and mixed-methods studies related to the study and discussion of OTDSCs.

7.10 What does the evidence from literature adds to programme theory refinement

The refinement of IPT using semi-structured interviews identified transferable explanations of how OTDSCs were created and how to minimise them (refer to sections 6.5 and 6.6). By contrast, atheoretical and weak evidence create significant limitations to developing CMOCs or transferable theories related to OTDSCs. Based on the identified evidence from the literature, the following themes can further validate the findings from the semi-structured interviews.

7.10.1 Standardised interventions – pre-assessment tools, protocols

Surgery preparation using various standardised interventions, including pre-assessment tools and protocols, plays an important role in minimising OTDSCs,

especially for clinical reasons (Díez-García et al., 2023; Schretlen et al., 2021b; Leite et al., 2019). Standardised interventions might help improve the consistency and comprehensiveness in preparing patients for surgery before patients are admitted to surgery (i.e., pre-operative care). Consequently, consistency and comprehensiveness might help improve the aspects of individualisation of care, which might minimise OTDSCs due to clinical reasons. Most interventional studies appear to suggest that interconnected standardised interventions, focused on prepare patients for surgery, can leads to minimising OTDSCs. Most studies appear to have the underlying assumption that a high level of standardisation can minimise OTDSCs (Leite et al., 2019; Miri Bonjar et al., 2019; Hines et al., 2015; Ellis et al., 2012). Unfortunately, the pre- and post-evaluation focused on what works by evaluating pre- and post-outcomes and failed to identify the inner workings of standardised interventions or how standardised interventions influence actors' clinical autonomy or behaviours.

7.10.2 Individualisation of care concerning clinical care planning

Several studies indicated that the individualisation of care concerning clinical care planning plays an important part in the preparation of surgery or the importance of patient-centred care in minimising OTDSCs (Schretlen et al., 2021b; Brazil et al., 2021). However, studies failed to make the link between the individualisation of care concerning clinical care planning and OTDSCs due to clinical reasons. Furthermore, the studies failed to explain how various behaviours by PONs influenced the individualisation of care or how different aspects of individualisation of care influenced different types of OTDSCs (patient or clinician-initiated). Some studies highlighted the importance of interventions needed to create various aspects of individualised care as well as standardisation (Brazil et al., 2021).

7.10.3 Clinical autonomy of PONs

The PONs or nurses in similar roles (e.g., nurse practitioners, registered surgical nurses, pre-operative surgical nurse practitioners) are a key part in preparing patients for surgery to minimise OTDSCs. Therefore, the clinical autonomy of PONs

appears to play an important role in influencing OTDSCs (Björn et al., 2017; Denholm et al., 2020; Sillero-Sillero and Zabalegui, 2020).

7.10.4 Unfavourable working conditions

However, PONs or nurses in similar roles appeared to work in various unfavourable working conditions, which led to high employee turnover, dissatisfaction, and emotional exhaustion. This might lead to an inadequate level of clinical autonomy and other undesired outcomes, such as incomplete surgical preparation and OTDSCs (Björn et al., 2017; Denholm et al., 2020; Sillero-Sillero and Zabalegui, 2020).

7.10.5 Inter-professional collaboration between the PONs and anaesthetists

Inter-professional collaboration between the PONs and anaesthetists appears to provide an important context to minimise OTDSCs, particularly for OTDSCs due to clinical reasons (Sillero-Sillero and Zabalegui, 2020; Schretlen et al., 2021a; Varughese et al., 2013). The inter-professional collaboration might have allowed PONs and anaesthetists to work together to improve individualisation of care. However, based on evidence there appears to be a link between inter-professional collaboration and OTDSCs and OTDSCs due to clinical reasons.

7.10.6 Patients trust in HCPs

The literature identified that trust and mistrust play an important role in patient-clinicians' interactions or the healthcare system (Viftrup et al., 2020; Denholm et al., 2020). On some occasions, the patient's lack of trust in clinicians might create OTDSCs (Viftrup et al., 2020).

7.10.7 Inter-professional collaboration

The inter-professional collaboration between the Nurse Practitioners (similar to PONs) and clinicians appears to improve the nurse practitioners' competency and confidence in decision-making to prepare patients for surgery that might minimise

OTDSCs due to clinical reasons (Varughese et al., 2013). However, based on identified evidence in the literature, there was no link related to compassion or situational awareness of the PONs and OTDSCs.

Figure 7.10 illustrate the points discussed in this section, and the arrows explain the link between the components and OTDSCs or OTDSCs due to clinical reasons: standardised interventions for clinical care planning, individualisation concerning care preparation, clinical autonomy of PONs (micro-context), organisational contexts – high workload, lack of staff, inter-professional collaboration (meso-contexts); behavioural mechanisms – confidence in PONs clinical decision making or self-efficacy and patients' trust among HCPs or health care systems. However, the identified studies failed to provide clear interactions on how various variables might work together to minimise OTDSCs.

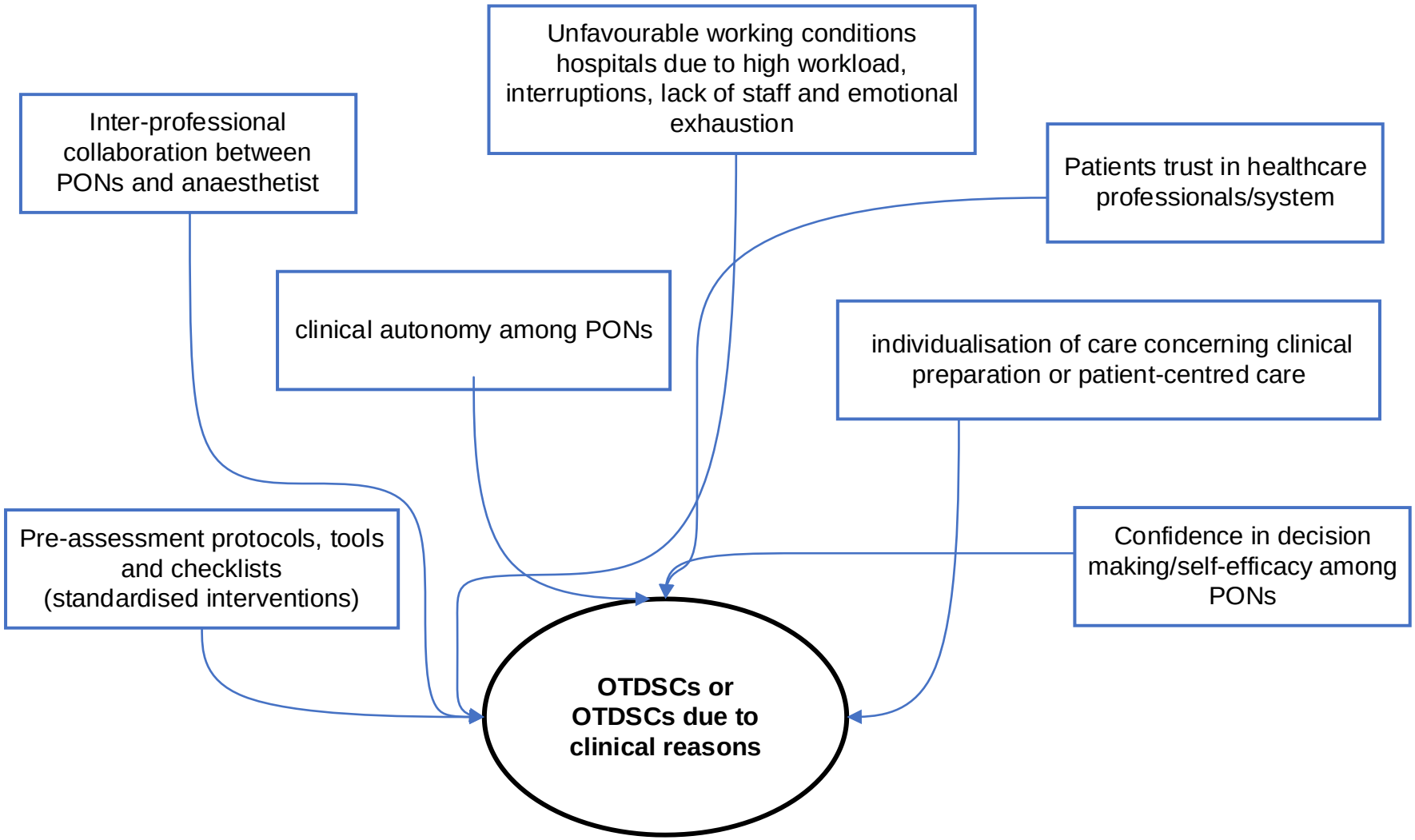


Figure 7.10-1 Summary of all the components that influenced OTDSCs or OTDSCs due to clinical reasons

7.11 Chapter Summary

This chapter is used to refine the findings of Chapter six based on the existing literature. The chapter used the five-stage method used in realist synthesis adapted from Pawson (2006, p. 79): defining the scope of the review, searching for relevant studies, quality appraisal, extracting the data and synthesising it. The scope of the review is based on the findings of Chapter six, sections 6.5 and 6.6. The review involved searches completed in three databases: Web of Science, Scopus, and Cochrane. From 5,990 information sources, 20 studies were identified according to the study selection criteria mentioned in section 7.4. For each study, the data was extracted into a table consisting of six columns: reference, the title, country, study design, main findings, and how might and should the intervention/findings work to influence OTDSCs (i.e., applying "realist logic"). In the final stages, the data extracted is synthesised to refine the findings highlighted in Chapter six.

The level of refinement of theory or ability to develop meaningful CMOCs depends on the availability of the literature related to the scope and their richness. The identified studies were from 11 countries and appeared to validate some of the findings highlighted in Chapters five and six. The identified evidence further emphasised that OTDSCs were a complex, context-sensitive and long-standing problem. Furthermore, OTDSCs also act as a safety mechanism to prevent harm to patients (Denholm et al., 2020). However, studies provide evidence of how a series of interconnected standardised interventions have been able to minimise them (Brazil et al., 2021; Schretlen et al., 2021a). Some studies indicated the importance of standardisation and individualisation of care contributed to minimising OTDSCs.

The evidence from studies identified that OTDSCs, due to clinical reasons, are linked to several interconnected variables: standardised interventions for clinical care planning, individualisation of care-related patient preparation, clinical autonomy of PONs(micro-context), which is influenced by organisational contexts (meso-contexts) and policy contexts (macro-context); behavioural mechanisms such as confidence in

PONs clinical decision making (i.e., self-efficacy) and trust. In contrast to refinement based on semi-structured interviews, the literature provided evidence related to neither compassion nor situational awareness among PONs influenced OTDSCs. Furthermore, unlike semi-structured interviews, there was not enough evidence to illustrate the link between the identified interconnected variables in the literature. For example, how clinical autonomy influenced the behaviours of PONs by improving self-efficacy, compassion, or situational awareness.

In the next chapter (discussion), synthesises all the evidence presented in chapters four, five, six and seven refine IPT one, and answers the research questions.

8 Discussion Chapter

8.1 Introduction to the Discussion chapter

This is the penultimate chapter of the thesis. This first section of the chapter summarises the realist investigation by explaining the five study phases. The second section provides a summary of all the findings. In the third section, the findings of the thesis are discussed in relation to the existing literature. The fourth section discusses the strengths, weaknesses, limitations of the study, as well as several future research directions that emerged from the findings. Finally, the chapter ends with a summary of personal reflections.

8.2 The summary of the realist investigation so far

This section provides a summary of the realist investigation in the last four phases. To answer the primary research questions, the study performed a realist investigation of OTDSCs, focused on one of the widely reported unintended outcomes in SSCSs (i.e., phase one). As highlighted in Chapter 4, the study developed a theory-gleaning exercise in phase two and synthesised five preliminary IPTs (refer to Table 4.4-1) from the literature (n=35). The preliminary IPTs were further refined to four IPTs (refer to Table 4.8.2) using multiple methods: findings on the feasibility study included results from eight NHS trusts, two feedback events with patient representatives (n=6), and eight expert practitioners (n=8). After careful consideration, the thesis prioritised IPT one, which explained how standardised interventions used in preparing patients for surgery influenced OTDSCs, with a focus on standardised clinical care planning interventions.

In phase three, using semi-structured interviews (n=29), IPT one is further refined and synthesised CMOCs using interview data (refer to Table 6.1-1 and Table 6.2-1). Phase four (i.e., Chapter 7) used evidence from the literature (n=20) to further refine the findings (section 7. 8). As part of phase five, this section brings all the evidence from all study phases and further refines IPT one to answer the research questions. The section below explains the summary of the main findings.

8.3 Summary of all the findings

This section brings all the evidence from all study phases and further refines IPT one to answer the research questions. This iterative analysis in phase five enabled a reconsideration of all the literature and other evidence to validate, refine, or refute and synthesise programme theory that explained OTDSCs for clinical reasons. The section below summarises the salient points related to phase five, in order to validate the findings.

8.3.1 Unintended outcome with significant negative impact

OTDSCs are a well-documented unintended outcome in SSCSs globally. OTDSCs create significant suffering for patients and carers, including substantial waste in HDSs. When OTDSCs occur, the allocated professional and physical resources could be fully or partially wasted. The cost of wasted OT time due to OTDSCs might be as high as £400 million per year in NHS in the UK (Gillies et al., 2018).

8.3.2 Related to preparing patients for surgery

When a patient is not suitable for the surgery due to clinical reasons, clinicians (e.g., surgeons and anaesthetists) who review the patient before the surgery tend to initiate OTDSCs due to clinical reasons which is related to failure to manage clinical risks. For example, failure to identify and manage clinical risks, such as co-morbidities (e.g., cardiac, respiratory, and hypertension), medication (e.g., anti-coagulant), the unavailability of diagnostic test results (e.g., blood or urine test and X-ray), or allergies (e.g., antibiotic and latex) (Saufl, 2004; Varughese et al., 2013; Díez-García et al., 2023; Hovlid et al., 2013).

8.3.3 Preventable but can be an important safety measure

The clinicians who reviewed the patients' clinical readiness initiate OTDSCs due to clinical reasons because they believed the surgery could create clinical risks during or after the surgery. Therefore, OTDSCs, due to clinical reasons, might be an

important patient safety measure. Despite the multi-factorial nature, the findings confirmed that OTDSCs, including clinical reasons, are mostly preventable, but there is no panacea to do so (Díez-García et al., 2023; Varughese et al., 2013; Brazil et al., 2021; Elkassabany et al., 2013). Despite the complex nature of the OTDSCs, the findings of the semi-structured interviews support that OTDSCs in general and OTDSCs due to clinical reasons are preventable (section 6.4).

8.3.4 How mechanisms emerged during the five phases

The thesis identified four behavioural mechanisms that emerged in different study phases. Table 8.3-1 highlights how each mechanism evolved during the different phases of the study.

Several ‘hunches’ or ‘hypotheses’ linked to mechanisms were identified in phase two as part of the theory gleaning. For example, patient feedback suggested the following terms to explain compassion: "caring behaviour", "thoughtful clinical decision making", and "caring culture"(section 4.6). In theorising exercises, Expert practitioners highlighted the “caring behaviour” of the PONs and other HCPs critical to minimise OTDSCs (section 4.7). Theorising with experts highlighted "PON clinical skills" and "competency and confidence in clinical decision-making", indicating self-efficacy. The situational awareness was indicated as a "failure to understand the full clinical risks beyond the protocol" or “wider awareness” of patients and clinical history by PONs (refer to section 4.7). The patient and expert feedback also highlighted that trust between patients and HCPs plays an important role in influencing OTDSCs, such as DNA or failure to provide consent to continue the surgery.

In phase two of the study, the further iterative analysis highlighted that previous literature had identified issues of trust between HCPs and patients as a contributing factor in OTDSCs (Vaughn et al., 2017). In phase two, theorising with experts suggested the importance of sufficient autonomy of PONs to enable behaviours (e.g., “caring behaviours” and “empathy”) to minimise OTDSCs (section 4.7). During

the feedback events with patients' representatives and theorising with experts, "competency and confidence" in clinical decision-making have emerged as important factors influencing OTDSCs.

In phase three, semi-structured interviews using the teach-learner approach helped validate and identify behavioural mechanisms from phase two. The participants explained various behaviours in their own words, and the teach-learner approach helped them to ask further insightful questions to clarify their ideas. For example, "You mentioned caring behaviours of PONs are vital to minimise OTDSCs" or "how does the wider awareness help to minimised OTDSCs?" or "What did you mean by caring behaviour of PONs?" or "When using clinical protocols, what impact does it have when PONs competency to OTDSCs?". The ability to interact using the teacher-learner approach is also useful for understanding the link between the OTDSCs and these behavioural mechanisms.

To improve the transparency, the thesis use various quotations related to behavioural mechanisms in Chapters five and six. The CMOCs in Chapter five explained how trust and distrust contribute to patient-initiated OTDSCs. The CMOCs in Chapter 6 highlighted how clinical autonomy activates the three behavioural mechanisms (compassion, self-efficacy and situational awareness) to improve various aspects of individualisation of care. The evidence presented in chapter six explained how behavioural mechanisms contributed (section 6.2) and minimised (section 6.3) OTDSCs.

Phase four, helped to validate the mechanisms and various linked related to OTDSCs using new set of literature. The patient's trust or distrust of the clinical team appears to influence the decision to continue with the surgery and leads to OTDSCs initiated by patients, such as DNA (Viftrup et al., 2020). The clinical autonomy of PONs appears to play an important role in influencing PONs behaviours and OTDSCs (Denholm et al., 2020; Sillero-Sillero and Zabalegui, 2020). Trust and mistrust play an important role in patient clinicians' interactions or the healthcare

system (Viftrup et al., 2020; Denholm et al., 2020). phase four, there was an explanation and evidence related to the behavioural mechanisms: self-efficacy and trust.

Phase five of the study revisits the phases and explores all the evidence again. As highlighted in section 3.6.3.3, the mechanisms were identified using dyads and triads approach (Mukumbang et al., 2019; Jackson and Kolla, 2012). Data from the semi-structured interviews supported all the mechanisms.

The section 2.4 provided clear definition to all the mechanisms. The thesis cleared definition related to mechanisms, contexts and outcomes (referred to section 3.4.4). The table 3.6-4 to explain the coding framework used to organise data in the five study phases. To improve rigour, the analysis complies with REMESIS guidance (appendix 8.8). All the mechanisms were supported by multiple evidence from more than two phases. The analysis is presented to supervisors and other doctoral workshops to improve the validity of the mechanisms and transferable explanations (section 8.9).

Mechanism	Phase Two	Phase three	Phase four
Compassion among PONs	During the feedback events with patients' representatives and theorising with experts, the connection between the OTDSCs and the idea of compassion emerged in various terms: "caring behaviour" of PONs, "caring attitude" of PONs, "caring behaviour", "thoughtful clinical decision-making" and empathy among PONs and anaesthetists.	Clear evidence that compassion of PONs is linked to OTDSCs. Please see the relevant CMOCs in chapter six. (section 6.2.1 and 6.3.1)	Based on the literature, there were no evidence links related to the compassion PONs and OTDSCs.
Self-efficacy among PONs	During the feedback events with patients' representatives and theorising with experts, "competency and confidence" in clinical decision-making have emerged as important factors that influenced OTDSCs.	Clear evidence that self-efficacy of PONs is linked to OTDSCs. Please see the relevant CMOCs in chapter six. (sections 6.2.3 and 6.3.2)	The inter-collaboration between the Nurses (i.e., PONs) and anaesthetists leads to improve the nurses competency and confidence in decision-making to prepare patients for surgery (Varughese et al., 2013). The connection between the improving confidence in nurses'

Mechanism	Phase Two	Phase three	Phase four
			decision-making and OTDSC (Dowd et al., 2023)
Situational Awareness among PONS	The concept of wider awareness of PONs beyond protocol-based care emerged during the theorising with expert practitioners. Expert practitioners highlighted that failure to understand the full clinical risks beyond the protocol has been interpreted as situational awareness.	Clear evidence that situational awareness of PONs is linked to OTDSCs. Please see the relevant CMOCs in chapter six. (section 6.2.4 and 6.3.3)	Based on the literature, no evidence was related to situational awareness of PONs and OTDSCs.
Trust among Patients undergoing surgery towards HCPs	Theory gleaning based on literature identified trust between HCPs and patients contributes to OTDSCs (Vaughn et al., 2017). Furthermore, feasibility studies, feedback and theorising with experts on trust between HCPs and patients contribute to OTDSCs.	Clear evidence that trust and mistrust of patients related to HCPs linked to OTDSCs The CMOCs in Chapter five (sections 5.4.1 and 5.4.2).	Trust and mistrust are important in patient–clinician interactions in the healthcare system (Viftrup et al., 2020; Denholm et al., 2020). Sometimes, patients' lack of trust in clinicians might create OTDSCs (Viftrup et al., 2020).

Table 8.3-1 Mechanisms emerged in the theory-building process

8.3.5 Individualisation and standardisation of care

The evidence from the literature in phase two emphasises the importance of various aspects of individualisation of care or patient-centred care by improving preoperative care to minimised OTDSCs, especially related to clinical reasons (Vaughn et al., 2017; Priebe, 2011; Spahn and Priebe, 2004). The patient and expert feedback also highlighted the importance of maintaining standardisation and individualisation of care throughout the care pathways and processes to minimise unintended outcomes, such as delayed discharges, negative patient experiences, and wrong patient information, including OTDSCs, due to clinical and patient reasons. Most studies in phase two explore the implementation of a wide range of standardised interventions that are interconnected, which appear to report the reduction of OTDSCs (Hovlid et al., 2012a; Olson and Dhakal, 2015; Pang et al., 2019; Barnes et al., 2000; Pratap et al., 2015a; Turunen et al., 2018). These studies are interested in implementing standardised interventions to minimise OTDSCs and improve quality in SSCSs with the underlying assumption that standardisation of care is a "universal solution" (Olson and Dhakal, 2015; Pang et al., 2019; Barnes et al., 2000; Pratap et al., 2015b; Turunen et al., 2018). Despite the reliance on a high level of standardisation of care, some studies appear to indicate the importance of standardisation and patient-centred care working closely together to minimise OTDSCs (Pratap et al., 2015; Argo et al., 2009; Hovlid and Bukve, 2014).

8.3.6 Clinical autonomy and professional power

Arguments about power related to professionals represent a broad and fascinating subject (Sake, 2016). As with professional status, the definition of power is a very abstract concept that is challenging to examine (Addicott and Ferlie, 2007; Goode, 1957; Sake, 2016). Giddens (1982) conceptualised power as a social factor and stated that power is created by human agents, which limits and influences them in various ways. In social science, the concepts of power among HCPs can be linked to concepts such as “medical dominance”,” professional power”, “clinical autonomy”, “tools for professional excellence” and “professional projects” (Addicott and Ferlie, 2007; Sake, 2016, Goode, 1957, Karriina et al., 2013).

After careful consideration of all the literature and evidence from CMOCs, the thesis considered that PONs clinical autonomy influenced identified behavioural mechanisms. HCPs rely on claims of exclusive knowledge, expertise and a code of ethics to exercise professional power and autonomy (Giddens, 1982). Literature has already been published on how clinical autonomy impacts concepts such as standardisation and individualisation of care (Björn et al., 2017). Clinical autonomy of PONs plays an important role in minimising OTDSCs (Denholm et al., 2020; Sillero-Sillero and Zabalegui, 2020). Furthermore, clinical autonomy can also be considered an aspect of the professional act to deliver the best care (Freidson, 2001) or HCP freedom to act based on what they know is in the patient's best interests (Kramer et al., 2006). Clinical autonomy is therefore a relevant concept close to power or professionalism, linked to the research questions. The definitions related to clinical autonomy are explained in section 2.3.1. The concept of clinical autonomy is supported by phases two to five. Based on the findings, the clinical autonomy of PONs is considered a context influencing behavioural mechanisms: compassion, self-efficacy and situational awareness.

This thesis takes a humanistic approach to minimise tension in standardisation of care and aims to minimise unintended outcomes in surgical care systems. After carefully considering all the evidence related to different data types, the thesis therefore used clinical autonomy as a context that activates several behavioural mechanisms (i.e., PON compassion, situational awareness, self-efficacy). Professional power does not come under the specific definition related to mechanism (refer to table 3.4.1). No reasonable evidence supported professional power as a behavioural mechanism linked to OTDSCs. The thesis used a large amount of data to investigate OTDSCs. It is possible that some evidence can be interpreted as medical dominance or gender differences or power-related concepts or identities. Every professional (surgeons, anaesthetists and PONs) has power, which can differ from profession to profession, and the impact on OTDSCs is unclear. However, it would be useful to explore the role of professional power as a context that is linked to OTDSCs in future studies.

8.3.7 Further categorising of OTDSCs

The iterative analysis found several interesting theories related to the categorisation of other OTDSCs, such as patient-initiated and unavailability of various physical (e.g., post-operative beds, theatre time) and personal resources (e.g., surgeons and anaesthetists). The iterative analysis also validates that OTDSCs due to unavailability of resources are linked to a range of contexts in and outside the organisations, especially the care delivery of the patients undergoing surgery. For example, evidence from the literature indicated neighbouring hospitals' infections, wider patient flow problems (e.g., lack of social care resources), and national policies appeared to consume the resources allocated to scheduled surgical care patients and influenced OTDSCs due to unavailability of resources (Seim et al., 2009; Schuster et al., 2011; McKendrick et al., 2014; Argo et al., 2009).

The literature and empirical work found that significant variation related to how organisations and studies report reasons or categorisations related to OTDSCs (section 4.5). For example, reporting reasons for OTDSCs in NHS hospitals vary from 18 to 76. Most OTDSCs appear to be linked to limitations in preparing patients for surgery. In phase two, the thesis presents a taxonomy of OTDSCs (section 4.8) and validates the taxonomy using semi-structured interviews (section 5.4). In addition to the taxonomy, the iterative analysis conducted in phase five identified that there are two main types of OTDSCs: category one, denoting a failure to prepare patients for surgery by considering individual clinical, communication and resource allocation needs before admission; and category two, denoting a failure to deliver care based on individual care needs on the day of the surgery.

Category one includes a wide range of OTDSCs due to clinical reasons, unavailability of resources (e.g., theatre time, post-operative beds, and equipment), patient reasons (e.g., failure to attend and follow pre-surgical instructions), and clinical reasons (e.g., patient unfit for surgery). Clinical reasons for surgery include failure to prepare patients and manage their risks (e.g., anaemia, allergies, hypertension, medication, or lack of diagnostic results) as part of clinical care preparation can lead to patient OTDSCs for a clinical reason. Similarly, failure to

allocate resources based on patient clinical needs, such as theatre time or equipment, or a specific type of post-operative bed (e.g., day case, in-patient, or high dependency beds) might lead to OTDSCs due to the unavailability of resources. Although the evidence from the literature did not differentiate OTDCSs with in-depth analysis, most studies focused on minimising OTDSCs related to category one (McKendrick et al., 2014; O'Dwyer et al., 2015; Pratap et al., 2015; Priebe, 2011; Barnes et al., 2000; Haufler and Harrington, 2011). The patient representatives and practitioner feedback suggested that OTDSCs related to category one are common in the NHS but difficult to understand due to limitations in the reporting of OTDSCs.

Category two is based on failure to deliver care related on individual care needs on the day of the surgery. For example, although the resources are allocated in advance based on specific patient individual clinical needs, they cannot be delivered due to specific resource unavailability on the days of the surgery; the resources have been reallocated to another patient due to resource prioritisation. For example, post-operative beds that were supposed to be allocated to scheduled surgical care patients were reprioritised and given to emergency patients. This also includes unavailability of resources (e.g., theatre time or post-operative beds). The expert practitioners' and patients representatives feedback suggested that category two is linked to patient flow problems, inadequate social care resources and high-emergency admissions within in NHS in England. The unavailability of post-operative beds could overlap both category one and two.

By and large, failures to deliver care on the day of surgery (category two) were driven by reasons outside of hospital's control, such as infection outbreaks in a neighbouring hospital, industrial actions, high emergency admission due to flu outbreaks, or critical accidents that lead to increased emergency admission (e.g., multiple accidents or bomb blasts)(Haufler and Harrington, 2011; Hovlid et al., 2013b; McKendrick et al., 2014).

8.3.8 Standardisation, as well as individualisation of care, play a vital role in minimising unintended outcomes.

There is substantive effort pit into and reliance placed upon, minimising unintended outcomes using standardisation of care approaches in SSCSs. These include standardised interventions, to minimise unintended outcomes such as OTDSCs due to clinical reasons, delayed start of the theatre and delayed discharges (Morton and Cornwell, 2009; Schretlen et al., 2021b; Leite et al., 2019; Schretlen et al., 2021a; Varughese et al., 2013). However, HDSs cannot minimise unintended outcomes solely through standardisation of care approaches. As demonstrated using CMOCs (section 6.4), in some contexts, standardisation appears to create unintended outcomes. An inadequate level of individualised care concerning clinical care planning provides an important context leading to OTDSCs for clinical reasons and other unintended outcomes. By contrast, OTDSCs, due to clinical reasons, are mostly minimised by providing an adequate level of individualised care concerning clinical care planning, which can be done in preoperative care. Therefore, the standardisation and individualisation of care both play a vital role in minimising OTDSCs due to clinical reasons.

8.3.9 How and in what contexts influenced OTDSCs due to clinical reasons?

The CMOCs and other evidence suggested that OTDSCs due to clinical reasons depend on the interactions of interconnected components: clinical autonomy of PONs (micro-context), which is influenced by organisational contexts (meso-contexts) and policy contexts (macro-context), behavioural mechanisms of PONs (i.e., compassion, self-efficacy and situational awareness) and standardised interventions related to clinical care planning and individualisation of care concerning clinical care planning.

Therefore, PONs play a vital role in preparing patients for surgery, and clinical care planning plays an influential role in minimising OTDSCs due to clinical reasons. However, clinicians who reviewed the patients' readiness for surgery on the day of the surgery initiate OTDSCs due to clinical reasons. The contexts that appear to improve the clinical autonomy of PONs are, inter-professional collaboration and

favourable organisational contexts, such as reasonable workload and adequate time to complete the clinical consultation. Using the CMOCs and other evidence, the paragraph below provides a transferable explanation of how these interconnected components work together to create OTDSCs due to clinical reasons.

When care is delivered using standardised clinical care planning interventions (pre-assessment protocols, care planning protocols), inadequate levels of clinical autonomy levels among PONs appear to create an insufficient level of compassion, self-efficacy and situational awareness among PONs. Consequently, this leads to inadequate levels of individualisation of care in clinical preparation. This creates OTDSCs due to clinical reasons, leading to insufficient trust in the clinical preparation among anaesthetists who review patients before surgery, which might result in OTDSCs. On some occasions, the inadequate levels of individualisation of care concerning clinical care planning, provide the context to OTDSCs due to the unavailability of resources such as the unavailability of a post-operative bed or theatre time (refer to section 6.2.7).

By contrast, when delivering care using standardised clinical care planning interventions by PONs, an adequate level of individualisation of care concerning clinical care planning provides an important context to minimise OTDSCs due to clinical reasons. Subsequently, adequate levels of individualisation of care in clinical preparation result, leading to trust in the clinical preparation of anaesthetists who review patients before surgery and resulting in minimising OTDSCs. Providing adequate clinical autonomy for PONs can be vital to start a chain of reactions among various important actors, creating adequate individualised care related to clinical care planning and leading to fewer OTDSCs. Adequate levels of clinical autonomy among PONs appear to activate the following behavioural mechanisms: compassion, self-efficacy, and situational awareness. Consequently, this leads to adequate levels of individualisation of care in clinical preparation and minimised OTDSCs due to clinical reasons.

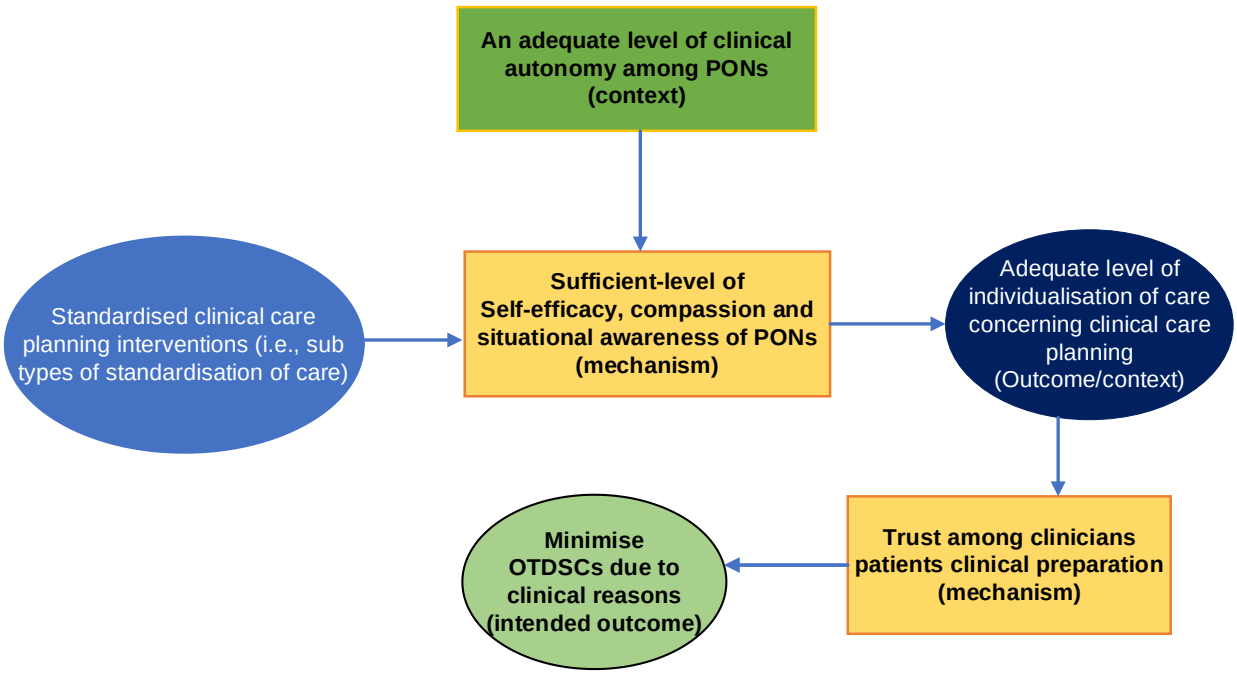


Figure 8.3-1 illustrates how the interactions of standardisation and individualisation of care and other components minimise OTDSCs due to clinical reasons.

Figure 8.3-1 provides a graphical illustration of the inner workings of the standardised clinical care planning interventions and summarise how the inter-connected components, work together and minimise OTDSCs. The arrows in blue explain the link between the six components. The mechanisms are illustrated in yellow boxes. Figure 8.3-1 demonstrates that when PONs, deliver care using standardised clinical care planning interventions, an adequate level of clinical autonomy of PONs (in the green box) activates behavioural mechanisms, creating an adequate level of individualisation of care concerning clinical care planning (purple circle). The adequate level of individualisation of care concerning clinical care planning provides an important context to activate trust among clinicians. Consequently, this leads to minimised OTDSCs due to clinical reasons. The adequate level of individualisation of care concerning clinical care planning, therefore, creates an outcome as well as context for this chain of events to minimise OTDSCs.

8.4 Discussion of results related to OTDSCs literature

OTDSCs are widely reported unintended outcomes in SSCSs (Abate et al., 2020). These cause significant suffering to patients, waste of resources, and have a negative impact on waiting lists (Argo et al., 2009; Gillies et al., 2018; Viftrup et al., 2020). Most of the literature is descriptive and atheoretical, highlighting the prevalence of OTDSCs or their negative impacts (Al Talalwah and McIltrot, 2019).

The realist investigates the use of evidence related to literature in phases two (n=35) and five (n=20), which is already discussed in Chapters 4 and 7. Therefore, this section provides a summary of some of the main findings. Most studies aimed at minimising OTDSCs focused on the implementation of standardised interventions, especially related to preoperative care (Leite et al., 2019a; Varughese et al., 2013; Jiménez et al., 2006; Elkassabany et al., 2013; Miri Bonjar et al., 2019; Schretlen et al., 2021c). The findings validated the link between the standardisation of care, especially standardised interventions used in preoperative care and OTDSCs due to clinical reasons. Some studies indicated the importance of patient-centred care in minimising OTDSCs but failed to explain how the concept can work with the standardisation of care (Vaughn et al., 2017; Hovlid et al., 2013a). Furthermore, the study validated that OTDSCs are specific to local contexts and complex undesired outcomes but that these are all factors that can be minimised and mitigated (Argo et al., 2009; Turunen et al., 2018).

The review identified that patients from low-income groups with language barriers are more likely to report OTDSCs (Al Talalwah and McIltrot, 2019). Two studies that performed a multivariant analysis in England and Singapore found that patients with low incomes (Tan et al. 2019) and low socio-economic backgrounds based on the “index of multiple deprivation” (McIntosh et al., 2012) are associated with high OTDSCs. A US study also identified that patients from lower socio-economic backgrounds, such as the homeless and those with limited personal travel resources, are likely to be at increased risk of OTDSCs (Argo et al., 2009). A qualitative study (Vaughn et al., 2017) also found many social and economic factors influencing OTDSCs, including family support systems, access to transportation,

flexibility in scheduling, previous experience in hospital settings and trust in the medical system, and it is important to overcome these using interventions. Various descriptive prevalence studies have highlighted patients suffering from co-morbidities as more likely to be cancelled as a result of, for example, anaemia, respiratory problems, hypertension, cardiac problems and diabetes (Tan et al., 2019; Kaddoum et al., 2016; González-Arévalo et al., 2009; Berger A.A. et al., 2017). Argo et al. (Argo et al., 2009) also highlighted that patients with clinical complications requiring specialist resources (i.e. professionals, beds and equipment) are more likely to report OTDSCs. It is quite possible that the particularities of some patient cohorts (i.e., low-income, multi-commodities) and individual clinical or socio-economic needs are not met during the pre-operative care or preparation for surgery and that this has exacerbated the occurrence of OTDSCs.

As part of the realist investigation, extensive searches in several databases and relevant websites were completed. The comprehensive searches failed to identify any systematic, realist or economic impact analysis to understand OTDSCs. Given the high global prevalence and widespread nature of OTDSCs, it is surprising that this issue has not caught the attention of researchers and funders. This study is likely to be the most comprehensive study completed in English on the subject of OTDSCs and, with this in mind, this thesis' contribution to knowledge is summarised in section 8.7.

8.5 Interactions of standardisation and individualisation of care

This research study investigates the tension between the standardisation and individualisation of care to study OTDSCs by focusing on the inner workings of standardised interventions clinical care planning interventions (refer to section 2.3). As highlighted, OTDSCs, including OTDSCs due to clinical reasons, are widely reported as an unintended outcome of SSCSs. Standardised interventions (e.g., clinical care planning) are a widely used type of standardisation of care (Timmermans and Epstein, 2010). The investigation of OTDSCs due to clinical reasons explains how the type of standardisation of care (i.e., standardised interventions or standard clinic time) combines with other contexts (e.g.

organisational and policy) to influence intended and unintended outcomes in HDSs. Considering OTDSCs due to clinical reasons as a case study, there is an opportunity to understand how and in what contexts the interactions of standardisation and individualisation of care can minimise undesired outcomes in HDSs. For example, when HCPs (i.e., PONs) who deliver care using standardisation care approaches (i.e., standard clinic time, terminology), including standardised interventions (i.e., clinical care planning tools, protocols), manage to address the individualisation of care, it appears to create favourable contexts to minimise unintended outcomes. By contrast, the failure of HCPs (i.e., PONs) to deliver individualisation of care creates unfavourable contexts and leads to unintended outcomes. Therefore, the findings of OTDSCs due to clinical reasons, suggest unintended outcomes can be minimised by managing an adequate level of individualisation of care in a standardised care setting.

The findings of OTDSCs suggest that when using standardised interventions to deliver care in HDSs, several interconnected components work together to minimise unintended outcomes, and improve quality. Therefore, based on the findings, the extent of standardised interventions to minimised unintended outcomes depends on the number of events that happened, which is far from linear and lies between the conditions and actors' behaviours. The findings of the thesis agreed with scholars who argued that various other types of standardisations of care, such as performance targets (Exworthy et al., 2019; Powell et al., 2012; Mannion and Braithwaite, 2012b) and procedural standards (e.g., standardised clinical care planning interventions, and clinical protocols) are far from linear and have the ability to create intended and unintended outcomes (Rycroft-Malone et al., 2009; Timmermans and Berg, 1997; Petrakaki and Kornelakis, 2016; Greenhalgh et al., 2009).

Considering OTDSCs due to clinical reasons as a case study, the thesis synthesised a transferable theory to explain how the interactions between the standardisation and individualisation of care can minimise undesired outcomes in HDSs. When HCPs have adequate clinical autonomy, this appears to activate various behavioural

mechanisms – compassion, self-efficacy, and situational awareness – and leads to individualisation of care. Consequently, trust in clinicians adequately preparing patients is another mechanism activated by individualisation of care, concerning clinical care planning, helping to minimise unintended outcomes like OTDSCs. The investigation of OTDSCs indicated that the behavioural mechanisms - namely, compassion, self-efficacy, and situational awareness -among actors activated by the clinical autonomy of the clinical actors, play a vital role in the ability of standardisation and individualisation care to work together. The realist investigations identified that an adequate level of clinical autonomy for HCPs plays an important role in activating several events that lead to minimising unintended outcomes.

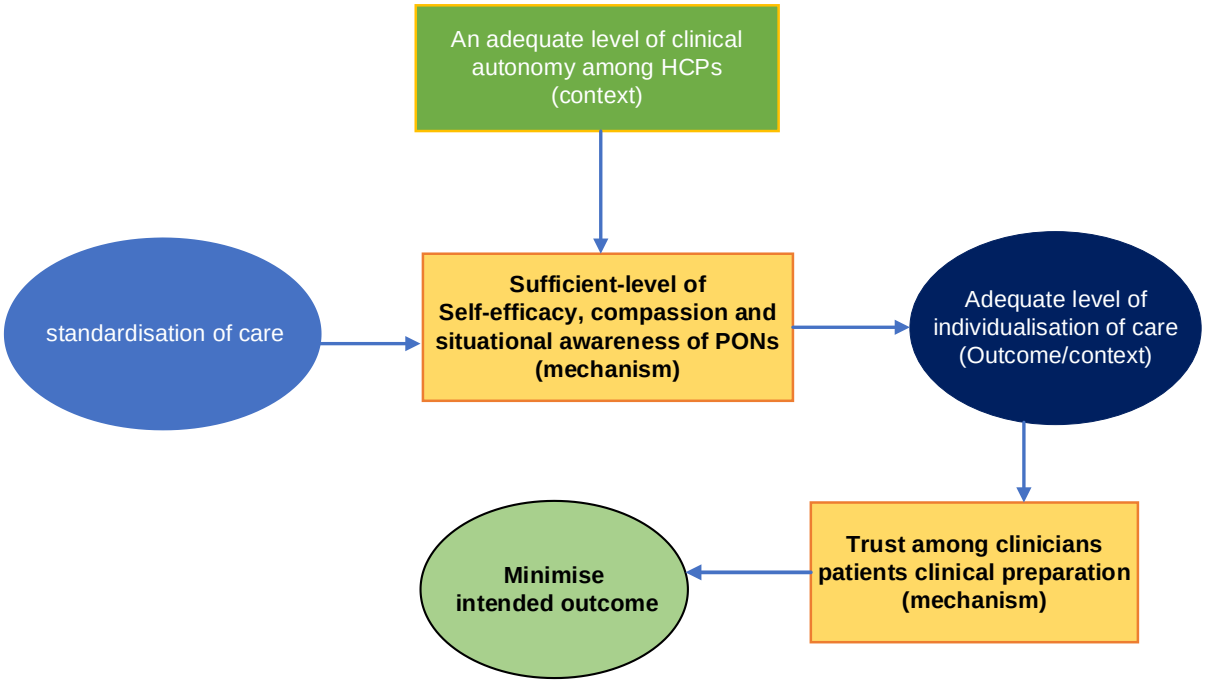


Figure 8.5-1 illustrate how the interactions of standardisation and individualisation of care and other components minimise unintended outcome.

Figure 8.5-1 provides a graphical illustration of the inner workings of how interactions of standardisation and individualisation of care, and other interconnected components, work together to minimise unintended outcomes in HDSs. The arrows in blue explain how the six components connect with each other. The mechanisms are illustrated in yellow boxes. Figure 8.5-1 demonstrates that, when HCPs deliver standardisation of care, an adequate level of clinical autonomy of HCPs (in the green

box) activates behavioural mechanisms, creating an adequate level of individualisation of care (purple circle). The adequate level of individualisation of care provides an important context to activate trust about the clinical preparation among clinicians. Consequently, this leads to fewer unintended outcomes. The adequate level of individualisation of care, therefore, is an important intermediator between the standardisation and unintended outcomes. An adequate level of individualisation of care also acts as an outcome as well as context within the chain of events to minimise OTDSCs.

The findings of OTDSCs suggest that the combination of standardised care approaches (i.e., standardised interventions and standard time to complete the clinical consultation) and unfavourable working conditions have negatively influenced clinical autonomy. The iterative analysis suggests that standardised interventions can be very helpful in organising data and trying to minimise variations in clinical practice. However, standardised interventions work by controlling actors' behaviours and roles. Standardised interventions in some contexts, unfavourable working conditions, and lack of time to complete clinical consultation tend to negatively influence health actors' (i.e., PONs) autonomy. Consequently, it might lead to unintended consequences and outcomes like OTDSCs due to clinical reasons. Although standardised interventions are adopted by policymakers as a "universal solution" to improve quality and have substantive benefits, in some contexts, standardised interventions appear to produce unintended consequences and outcomes. In other words, the thesis cautioned against over-relying on standardisation of care to minimised unintended outcomes, instead of highlighting the importance of creating conditions for clinical autonomy among HCPs and focusing on individualisation as well as standardisation of care.

8.6 Discussion of results related to standardisation and individualisation of care

According to the findings of the investigation, unintended outcomes are influenced by several interconnected components: clinical autonomy, organisational and policy contexts, behavioural mechanisms (i.e., compassion, self-efficacy, situational

awareness, and trust), and standardisation and individualisation of care. However, it is also important to point out that most of these interconnected components are, in general, widely discussed in isolation in different branches of social science.

One of the main characteristics of a coherent programme theory is analogous to substantive theory or aligns with existing credible theories (Dada et al., 2023). The section below discusses the above points mentioned by Dada and colleagues (2023) by providing various interconnected components relevant to the study findings from the wider literature. This is, in general, discussed in isolation (e.g., standardisation of care and unintended outcomes, and individualisation of care and behavioural mechanisms).

There is a plethora of evidence from operations management literature that the implementation of standardisation of care including standardised interventions improves healthcare quality and minimises unintended outcomes in a wide variety of HDSs (Litvak and Long, 2000; McManus et al., 2003; Holweg et al., 2018; Smith, 2009; Leotsakos et al., 2014; Timmermans and Epstein, 2010; Lazzara et al., 2022b). Similarly, there is also evidence that argues the importance of compassion in improving individualisation of care and how individualisation of care in HDSs minimised unintended outcomes and improved quality (Suhonen and Charalambous, 2018; Leino-Kilpi and Rannikko, 2019; López-Domingo and Rodríguez-Martín, 2021; Bukecık and Terzioglu, 2021b; Theys et al., 2021).

The standardisation of care is a very strong and broad concept in modern HDSs, as well as any other system. Consequently, standardisation of care exists in many shapes or sub-types (Timmermans and Berg, 1997; Timmermans and Epstein, 2010) such as performance targets, terminology, and procedural standards. The realist investigation explored the inner working procedural standards, one of the sub-types of standardisations of care (i.e., standardised clinical care planning interventions) and found that the ability of standardisation of care to minimise undesired outcomes is context-dependent and far from linear. The findings of the thesis agreed with

scholars who argued that various other sub-types of standardisations of care such as performance targets (Exworthy et al., 2019; Powell et al., 2012; Mannion and Braithwaite, 2012), and procedural standards (e.g., clinical care planning interventions, and clinical protocols) are far from linear and have the ability to create intended and unintended outcomes (Rycroft-Malone et al., 2009; Timmermans and Berg, 1997; Petrakaki and Kornelakis, 2016; Greenhalgh et al., 2009).

Endorsements from policymakers, healthcare organisations, and royal societies, and despite being supported by promising results in early pilot studies, the institutionalisation of standardisation of care by introducing a range of checklists, protocols, targets and guidelines has produced mixed results in healthcare and surgical care settings (Urbach, 2015; Radnor and Osborne, 2013; Lydahl, 2021). The thesis findings agreed with other scholars who suggest that the inner workings of standardisation of care are far from linear and much more complicated and have the ability to create intended and unintended outcomes. However, some argue that failure to achieve the intended outcome or minimise unintended outcomes was due to an implementation problem suggesting various accountability frameworks and determining factors and variables to improve implementation (Zuiderent-Jerak, 2007; Grocott et al., 2019; Massenburg et al., 2017). However, the thesis findings suggest that the concerns around standardisation of care are not merely related to implementation but are much more complicated (Lydahl, 2021; Radnor and Osborne, 2013; Bosk et al., 2009; Greenhalgh and Papoutsi, 2018).

Individualisation of care is a broader term for the adjustment of health services to the patient's psychological, social, biological, and cultural needs (Pfaff et al., 2010). Concepts such as personalisation, customisation, and patient-centred care represent an emerging and opposite pole to the previously established standardisation of care (Ferlie, 2017). Terms such as customisation and personalisation of care are branches of individualisation of care (Ansmann and Pfaff, 2018). Some scholars argue that standardisation and individualisation of care are two polarised concepts, and there is a wide recognition that there is tension between the two concepts (Davies and Taylor, 2013; Rostgaard, 2012; Kvæl et al., 2022). Similar arguments

around the tension were made between the standardisation of care and personalisation of care or customisation of care (Mannion and Exworthy, 2017, 2018; Rycroft-Malone et al., 2009b; Greenhalgh et al., 2009). The findings of the thesis validate the arguments that there is tension between standardisation and individualisation of care in HDSs in the clinical interface in some contexts (e.g., lack of time to complete the clinical consultation, unreasonable workload), which can lead to unintended outcomes in HDSs.

In general surgical care literature, there is a recognition of how the identified mechanisms and contexts improve individualisation of care or similar branches of individualisation of care. The relationship between self-efficacy and increased ability to address patients' individual needs by providing patient-centred care and person-centred care has been identified in several studies (Bombeke et al., 2012; Fridberg et al., 2021; Nørgaard, 2011). Similarly, the effect of high workload is identified as an obstacle to delivering patient-centred care (Jangland et al., 2011). High workload is identified as a key factor hindering the delivery of compassionate care to surgical patients (Babaei et al., 2016). Lack of time is also identified as a barrier to delivering patient-centred care (Poirier and Sossong, 2010; Jangland et al., 2011). Indeed, lack of time to provide care also limits the ability to deliver compassionate care to surgical patients (Dwamena et al., 2012; Babaei et al., 2016). The association between situational awareness and patient-centred or person-centred care is also described in a number of studies related to the realist reviews (Jangland et al., 2011; Bombeke et al., 2012; Babaei et al., 2016; Arakelian et al., 2017; Kaptain et al., 2019; Fridberg et al., 2021).

For decades, the tension between clinical autonomy and standardisation of care in frontline HCPs were widely discussed (Martin et al., 2017; Wilhelm et al., 2019; Exworthy et al., 2019). Evidence suggests that there is wide acceptance of the concept of standardisation approaches, such as care pathways in NHS, but concerns are noted about the impact on professional judgement (Martin et al., 2017).

Many scholarly works discussed behavioural mechanisms such as compassion, self-efficacy, situational awareness, and trust, influencing various healthcare quality aspects (Milam et al., 2019; Brennan et al., 2020; Amutio-Kareaga et al., 2017; Tehranineshat et al., 2019) in HDSs including SSCSs. The thesis identified that when using standardised care interventions, the combination of adequate levels of clinical autonomy among healthcare actors and behavioural mechanisms (i.e., compassion, self-efficacy, situational awareness, and trust) of healthcare actors increases aspects of individualisation of care of the patients. Therefore, this thesis makes a contribution to knowledge by making the link between individualisation of care and clinical autonomy among healthcare actors and behavioural mechanisms (i.e., compassion, self-efficacy, situational awareness) and standardisation of care.

8.7 The knowledge contribution of the thesis

The realist investigation makes several novel contributions to knowledge in two important areas: improving the understanding of OTDSCs due to clinical reasons and understanding the interaction between the standardisation and individualisation of care to minimise unintended outcomes that might help to improve healthcare quality in HDSs.

8.7.1 The dynamics shaping OTDSCs due to clinical reasons

A significant number of studies concerning OTDSCs are atheoretical and descriptive, which is a noteworthy barrier to developing evidence-informed interventions and minimising them. Another set of studies explores the trend of implementation of standardised interventions used to deliver pre-operative care to minimise OTDSCs and improve SSCSs (Leite et al., 2019a; Varughese et al., 2013; Díez-García et al., 2023; Brazil et al., 2021). Going against the trend of exploring the implementation of standardisation, this thesis took a novel approach by trying to understand how the inner workings of standardised clinical care planning influence OTDSCs due to clinical reasons. It is highly improbable that any systematic or realist reviews have been completed in the English language to understand or minimise OTDSCs. The thesis is likely to be the most in-depth study in the English language to date to understand and draw conclusions in relation to OTDSCs due to clinical reasons.

The thesis provides novel contributions to minimising OTDSCs due to clinical reasons by developing a transferable programme theory and explaining how, in what contexts, and to what extent OTDSCs due to clinical reasons can be minimised (refer to section 8.3.8). Figure 8.3-1 summarises the graphical demonstration of transferable programme theory that explains how to minimise OTDSCs due to clinical reasons. The thesis identifies several mechanisms concerning OTDSCs related to clinical reasons: clinicians' trust in patients' clinical preparation, compassion, self-efficacy, and situational awareness among PONs. The thesis makes a novel contribution to the link between OTDSCs related to clinical reasons: clinical autonomy of PONs, compassion, self-efficacy, and situational awareness among PONs, and individualisation of care related to clinical care planning preparation and clinicians' trust in patients' clinical preparation.

Various types of standardisations of care are used to improve the quality of SSCSs. It could be argued that standardisation is considered the universal solution to improve SSCSs globally. The thesis explained how standardised interventions and other approaches used to deliver clinical care planning in some contexts (i.e., inadequate level of clinical autonomy among PONs) can lead to OTDSCs due to clinical reasons. Furthermore, the thesis makes a novel contribution to knowledge by identifying how various aspects of individualisation of care influence different types of OTDSCs. For example, an inadequate level of individualisation of care concerning clinical care planning provides a context to OTDSCs for clinical reasons. By contrast, an adequate level of individualisation of care concerning clinical care planning provides a context to minimising OTDSCs for clinical reasons. Therefore, the thesis highlights the importance of both individualisation and standardisation of care in care delivery to minimise OTDSCs due to clinical reasons. Therefore, the thesis highlighted not only standardisation but also the importance of a judicious balance between individualisation and standardisation of care in care delivery to minimise OTDSCs due to clinical reasons.

The variation of categorisation of OTDSCs is a significant barrier to developing theories and developing interventions on how to minimise them. To overcome the limitation of categorisation, the thesis made a useful contribution to knowledge by developing a taxonomy that categorises OTDSCs using various aspects of individualisation of care. Furthermore, the thesis makes a novel contribution to practice by developing an evidenced-based report tool to improve the categorisation of OTDSCs, which has several advantages to minimise OTDSCs.

8.7.2 How the interactions of standardisation and individualisation of care influence unintended outcomes

By and large, standardisation and individualisation of care influenced various aspects of healthcare quality, mostly studied separately. There is a plethora of evidence, from operational management literature that the implementation of standardised interventions and other standardised approaches improves, healthcare quality and minimises unintended outcomes (Litvak and Long, 2000; McManus et al., 2003; Holweg et al., 2018; Smith, 2009; Leotsakos et al., 2014; Timmermans and Epstein, 2010). Similarly, there is evidence of how individualisation of care in HDSs minimises unintended outcomes and improves quality (Suhonen and Charalambous, 2018; Leino-Kilpi and Rannikko, 2019; López-Domingo and Rodríguez-Martín, 2021; Bukecık and Terzioglu, 2021b).

There are many types and sub-types of standardisation of care (Timmermans and Berg, 1997; Timmermans and Epstein, 2010) and aspects of individuation of care (Suhonen et al., 2018; Bukecık and Terzioglu, 2021b; López-Domingo and Rodríguez-Martín, 2021). The realist investigation explores how one of the sub-types of standardisations of care (i.e., procedural standards) and aspects of individualisation of care work together to influence unintended outcomes and improve healthcare quality. Consequently, the realist investigation is able to explore these two concepts together – standardisation and individualisation of care – to understand how and why these two concepts work together to influence unintended outcomes and improve healthcare quality. The thesis agreed with scholars who argued that standardised interventions, are far from linear and have the ability to

create intended and unintended outcomes (Rycroft-Malone et al., 2009b; Timmermans and Berg, 1997; Petrakaki and Kornelakis, 2016; Greenhalgh et al., 2009). Moreover, the thesis contributed to knowledge by highlighting, in some contexts, how standardisation of care, inadequate level of clinical autonomy of HCPs and individualisation of care, can lead to unintended outcomes such as OTDSCs due to clinical reasons.

Several healthcare and social care scholars have argued that there is a tension between standardisation and individualisation of care (Davies and Taylor, 2013; Rostgaard, 2012; Kvæl et al., 2022). Similar arguments were made between the standardisation of care and personalisation of care or customisation of care, which scholars argued needs to be resolved (Mannion and Exworthy, 2017, 2018; Rycroft-Malone et al., 2009; Greenhalgh et al., 2009). The findings of this thesis validate arguments that tension between standardisation and individualisation of care exists and help to explain why some contexts (e.g., unfavourable contexts and a lack of time to complete the clinical consultation) create such tension, which can lead to unintended outcomes in HDSs.

Pfaff and colleagues argue for the “Individualised standardisation” concept, where standardisation and individualisation need to work together in HDSs (Ansmann and Pfaff, 2018; Pfaff et al., 2010). The findings of this thesis are associated with the concept of “Individualised standardisation”. Furthermore, the thesis contributes to knowledge by explaining how and in what contexts standardisation and individualisation of care might work together to minimise unintended outcomes, which might lead to improved healthcare quality (refer to section 8.5). The thesis presented a transferable theory and developed a qualitative model to explain how and what contexts standardisation and individualisation of care minimise undesired outcomes.

Many scholarly works discussed behavioural mechanisms, such as compassion, self-efficacy, situational awareness, and trust, influencing various healthcare quality

aspects (Milam et al., 2019; Brennan et al., 2020; Amutio-Kareaga et al., 2017; Tehranineshat et al., 2019) in HDSs. The thesis identified that when using standardised care interventions, the combination of adequate levels of clinical autonomy among healthcare actors and behavioural mechanisms (i.e., compassion, self-efficacy, and situational awareness) of healthcare actors increases aspects of individualisation of care of the patients. Therefore, the thesis makes an important contribution to knowledge by establishing the link between individualisation of care and clinical autonomy among HCPs and behavioural mechanisms (i.e., compassion, self-efficacy, and situational awareness) and standardisation of care.

8.8 Dissemination of findings

As Chapter 1 highlights, this research investigation aims to improve patient outcomes by understanding how to minimise unintended outcomes. The research project has already started disseminating results at several international and national conferences related to healthcare management (refer to table 8.8-1). In addition, several meetings were held with the NHS elective recovery team to inform the findings. In 2023, at the EMHA conference, I was awarded the best contribution associated with a doctoral thesis in the field of health management, meaning that I had the opportunity to speak at the end of the main conference.

Two publications, for which I am the first author and my supervisors are co-authors, are in the process of being peer reviewed. The viewpoint article entitled “Bridging the divide? Why the integration of standardisation and individualisation of care remains paramount during turbulent times” was submitted to the BMJ Leader journal. The original research article entitled “The first step of a realist investigation: Building an initial realist theory of on-the-day surgery cancellations” was submitted to BMC Health Research. The paper shared the results in phase two of the study, highlighted in Chapter 4. The article is available on Research Square as part of the peer review process. Further dissemination work is planned after the thesis submission, including peer-reviewed publications, workshops and presentations for the NHS elective care recovery team and royal colleagues, anaesthetists and surgeons.

International and national conference	Presentation title
European Health Management Association (EMHA) – 2023	A refined theory of the interplay between standardisation and individualisation of care: A realist evaluation and synthesis of on-the-day surgery cancellations.
Organisational Behaviour in Health Care – 2022	Can the insights from individualisation and standardisation care help to influence quality healthcare organisations?
Health Service Research UK – 2021	Lessons from the pre-COVID era to reduce surgery cancellation in the English NHS.
Health Service Research UK – 2020 presentations	A case of a hidden or misunderstood problem: How representative are national performance indicators for operation cancellations in the English NHS?

Table 8.8-1 summarises presentations completed at international and national conferences

8.9 Strengths, weaknesses, and limitations

The review is guided by the RAMESES quality and publication standards for realist synthesis (Wong et al., 2013) and evaluation (Wong et al., 2016).Please refer to appendices 7.1.1 and 8.8.

Challenges in conducting realist reviews are widely acknowledged (Duddy & Wong, 2022; Hunter et al., 2022). Maintaining transparency in the research process is an important but challenging task(Booth et al., 2020; Gilmore et al., 2019). Despite attempts to exhibit transparency, the nature of the realist enquiry makes it challenging to maintain transparency. Unlike in analysis of a quantitative model, where certain indicators summarise the analysis and it is relatively easy to reproduce and maintain transparency, analysis in a realist methodology tends to evolve rapidly and is iterative and challenging to reproduce. The nature of the realist analysis means that too much information related to analysis on different levels of abstraction can easily lead to confusion among readers. It is therefore vital to maintain a reasonable balance between providing too much information and transparency.

Various steps were taken to maintain transparency in the analysis. The analysis in each phase is explained and the results are summarised in different chapters. The thesis defines the terms of the ICAMO heuristic and explains how programme theories evolved throughout the research process. The data extraction tables relate to the literature (refer to tables 4.4-2 and 7.6.1). Carefully identified quotations were used and presented with descriptions related to CMOCs in Chapters 5 and 6. The following appendices illustrate the various steps taken during the analysis: appendices 3.6.2, 3.6.3-1 and 3.6.3-2.

The thesis findings were strengthened by using trustworthy data from multiple data sources from different methods. The theory gleaning and refinement were completed with a wide range of literature (n=55) from different countries and consisted of different study designs. Furthermore, the study is strengthened by feedback from patients and experienced practitioners and semi-structured interviews conducted with a wide variety of actors who are familiar with OTDSCs. The use of multiple sources and actors' perspectives aided me in understanding a wide variety of perspectives and the opportunity to examine my interpretations carefully, which helped me to avoid misunderstandings and misinterpretations. Notably, in phase five, going back to previous data provided an opportunity to validate the findings again, improve the credibility of the findings and improve the coherence of the programme theory.

As explained in section 8.7, one of the strengths of the findings of the study is that it can bring theories from several disciples, and subject areas, usually studied in isolation, to develop a coherent and consistent transferable theory to understand how to minimise OTDSCs. To improve the screening of evidence from the literature, the study used clear inclusion and exclusion criteria to improve evidence of the screening.

Relevance can be applied in two ways in realist studies: the evidence (i) is relevant to the content/topic of interest or research questions, and (ii) provides evidence

relevant to theory development and refinement (Dada et al., 2023). This review demonstrated relevance in both ways, by considering the relevance to the topic and programme theory development and refinement. The rigour of the study is further strengthened by the quality appraisal of the evidence empirical studies from literature reviews (except the evidence review); the quality was appraised using the MMAT (refer to appendices 3.6.1 and 7.4.1).

The quality of the review is based on a wide variety of evidence from trustworthy sources and uses a clear research process that explains in what phase and how evidence is used to develop or refine programme theories. Therefore, the rigour of the study is maintained at the level of the included data and the development of developed or refined programme theories (Dada et al., 2023).

As a doctoral researcher, I tried my best to engage with a wide range of formal academic and informal groups to strengthen my understanding of the methods, theory, and interpretation of results, which helped me to further improve clarity and understand the plausibility of the programme theory. I have presented my work at several conferences in various stages of the research process, which also gave me the opportunity to engage with experienced practitioners and scholars to gain confidence in my synthesis and improve the coherence of the programme theory that I developed.

For example, at the initial stage of my work, I presented at HSR conferences in 2019 and 2020. In 2021, as part of the online realist conference, I presented some of the challenges in the analysis, where I was able to gain valuable advice from Professor Ray Pawson and Professor Bruno Marchal. In 2022, I presented the findings of three chapters at an organisational behavioural conference as part of a 90 minute panel session. In 2023, I presented my work at the European Healthcare Management Association (EHMA) and won the annual award for the best knowledge contribution from a doctoral thesis related to healthcare management. In EHMA, my work attracted substantial attention from international collaborators and helped me gain

useful feedback from international experts and scholars. All these experiences, as a doctoral researcher, were daunting and uncomfortable but helped me to gain valuable feedback from a wide range of practitioners and academics, which helped me gain assurance of my findings and synthesis. Finally, throughout the research journey, I received mentoring support from Dr Justin Jagosh, advice from colleagues in realist forums and continuous feedback from my supervisors, who helped me to improve interpretations, analyses and presentations focused on the research questions. All these experiences helped me to validate the findings and strengthen the coherence of the programme theory that developed.

OTDSCs are a global challenge where global prevalence is as high as 18% (Abate et al., 2020). The majority of evidence used in the thesis is focused on Europe and North America. The use of evidence outside Europe and North America is limited; however, the study captures some evidence from the Middle East and Southeast Asia (Chiu et al., 2012; Chen et al., 2010; Abate et al., 2020). The empirical evidence collected and analysed in the study is from the NHS in England, alongside my working experiences, and feedback I received from colleagues in the UK. In addition to that, most practitioners and academics who engaged with this study from outside of the UK are from European settings. Therefore, it is difficult to estimate the relevance and applicability of the synthesised programmable theory and the models in countries outside Europe and North America, especially for middle-income and low-income countries.

It is important to recognise that some middle-income and lower-income countries have adopted innovative practices to manage waiting lists and efficiently use resources to improve surgical care (Ensor et al., 2020; Massenburg et al., 2017; Crisp, 2022). All the evidence used in this study is in the English language; therefore, the study did not manage to capture evidence published in other languages that may have benefited the investigation.

One limitation of the realist investigation is that it relies on the details and depth of the reports I identified in the literature review and the quality of the data I collected using different methods. Although I collected data from different sources using different methods, the accuracy of my findings was affected by the truthfulness of what the authors could report in the literature and what participants revealed in feedback sessions or interviews. To manage this limitation, I have tried to use literature from different countries, as well as a wide range of subject areas and study designs.

The use of direct quotes improved the transparency of the use of evidence and demonstrated how fragments of evidence related to CMOCs intended to communicate the sources of explanatory concepts (Gilmore et al., 2019). However, as anticipated, there were elements of my own interpretation as a researcher. It is feasible that other researchers might interpret the data differently (Price et al., 2021).

I used a participatory approach to identifying and developing IPTs, which include patient representatives (e.g., service users) and expert practitioners. Although this process was time-consuming and led to lots of logistical problems, it helped me minimise selective bias and later develop transferable programme theories useful to patients, practitioners, and policymakers. In addition to that, gaining mentoring support from Dr Justin Jagosh and presenting the work in realist workshops helped improve the clarity of analysis, especially the development of CMOCs and further minimised the selective bias. Furthermore, as a doctoral student, I also had the opportunity to gain feedback and ask for assurance from my supervisors, which also minimised the selective bias and improved the presentation.

Throughout the data collection, most HCPs expressed their unhappiness with NHS policy interventions, including austerity measures, lack of social care, and high number of emergency admissions (Sheard and Peacock, 2019). During the data collection period, there was substantive pressure in NHS hospitals to minimise OTDSCs from various governing bodies, including the DH, NHS England and

commissioners. Consequently, hospital senior administrators put pressure on operational managers and HCPs (Sheard and Peacock, 2019). For these reasons, during the data collection period, OTDSCs were a controversial and a sensitive topic (Gillies et al., 2018). A wide range of national media (e.g., the BBC, Daily Mail and Guardian) was very interested in OTDSCs. Some participants use feedback events and sessions to express their anger towards politicians, using very aggressive and strong language. As a result of the sensitivity and "taboo" topic, it was very challenging to find experienced participants who were happy to be involved in the interviews. To overcome this limitation and improve participation, I had to work patiently and spend lots of time in various NHS hospitals, gaining HCPs trust and providing assurance related to the confidentiality of the potential participants.

8.10 Future directions of research

The PT I synthesised using multiple methods and data sources with rigour; I have confidence that it explains why OTDSCs due to clinical reasons, are happening, in what contexts, and to what extent they can be minimised. Those reported here have been refined using multiple sources of evidence as far as resources would permit, and no question will evolve further in the future. It would benefit further by refining the transferable theory to confirm, refute, or refine using other methods and other contexts. For example, the findings of OTDSCs could be further refined by using other methods like in-depth incident analysis techniques (i.e., significant event or root cause analysis) or ethnography or case study. The study identified four IPTs and explored one IPT. Future studies can be focused on the other three IPTs to understand and minimise other types of OTDSCs.

The motivation to investigate OTDSCs is to understand how to minimise unintended outcomes in HDSs. Individualisation and standardisation are opposing trends in human service organisations or systems. Most of the HDSs are undergoing high levels of standardisation of care but also reported a high prevalence of unintended outcomes, such as in maternity care, related to maternal and neonatal deaths and stillbirths; and primary care, related to prescription errors or misdiagnosis. Maternity care is under particular review in several high-income countries and some argue

there is tension between the autonomy, individualisation and standardisation of care driving various unintended outcomes (Koblinsky et al., 2016; Reiger and Morton, 2012; Enkin et al., 2006). Therefore, refining synthesised theories further by investigating some of these unintended outcomes can be very useful in improving maternity care as well as refining the theories further.

The thesis found that the combination of clinical autonomy and various behavioural mechanisms, such as compassion, self-efficacy, and situational awareness of PONs, play an important role in improving individualisation of care and minimising unintended outcomes. However, nurses are a professional group at risk of excessive levels of burnout and stress in modern HDs due to various policy changes, including standardisation of care, the nature of their work and working conditions (Dall'Ora et al., 2020). The evidence from many high-income countries suggests nurses working in preoperative care (e.g., PONs and surgical care) work in unfavourable working conditions (Hines et al., 2009; Falk-Brynhildsen et al., 2019; Fisher and Peterson, 1993), which is a significant barrier to providing high-quality surgical care as well as minimising undesired outcomes such as OTDSCs.

Most nursing roles appear to suffer from burnout, anxiety, and stress (Dall'Ora et al., 2020). On the other hand, globally, due to social and economic pressures (Akangbe et al., 2021; Houdmont et al., 2022) the standardisation of care is likely to increase, as well as the pressures to minimise waiting lists. Consequently, education or awareness of policymakers alone is unlikely to improve the clinical autonomy among PONs. Therefore, it is vital to understand how to improve clinical autonomy among PONs, various behavioural mechanisms, such as compassion, self-efficacy, and situational awareness of PONs involved in preoperative care or surgical care systems. A plethora of clinical and non-clinical evidence suggests that mindfulness interventions (i.e., mindfulness-based stress reduction) are able to improve and maintain self-awareness and self-compassion levels and to improve burnout, depression, anxiety, stress and individualisation of care among HCPs (Conversano et al., 2020). Some qualitative studies and uncontrolled studies indicated mindfulness programmes improved performance at work (e.g., better communication

with other colleagues and patients, and higher sensitivity to patients' experiences) (Guillaumie et al., 2017). Significant positive correlation between nurses' mindfulness levels and their perception of individualised care among nurses (Cura et al., 2022). Evidence suggests a significant positive correlation between their mindfulness and total compassion levels (Üzen Cura and Atay, 2023). Some argue that mindfulness interventions as cost-effective interventions that have a wide range of well-being and organisational benefits (Lomas et al., 2018; Johnson et al., 2015). Therefore, it is worth evaluating how introduction to mindfulness interventions targets HCPs (i.e., PONs and surgical nurses) to understand the impact of clinical autonomy and provide individualisation of care among HCPs and OTDSCs due to clinical reasons.

8.11 Personal reflections

When I reflect on my experiences during this doctoral thesis, I realise that I have made a unique personal journey, on several levels, which has transformed my thinking and helped me to gain a wide variety of transferable skills.

As a chemistry graduate, I studied various branches of chemistry (i.e., physical, organic and biochemistry). I am experienced in experimental design, where studies focus on a handful of variables. Before my doctoral work, most of my analysis was based on using quantitative methods. In my doctoral studies, however, I moved from my mostly empirical conceptualisation towards a more holistic and theory-based approach, to answer my research questions. As a result, I have had to continuously question and adapt my thinking, and on many occasions this has taken me out of my comfort zone, which has radically changed my habitual thinking patterns. Moving away from my mostly empirical-based to theory-based approach, to answer my research question helped me to improve my overall analytical and writing skills.

My personal motivation for completing this doctoral study was to understand unintended outcomes and improve patient care. During my ten-year career in NHS, I witnessed and was actively involved in minimising unintended outcomes such as blood transfusion errors, cancer misdiagnoses, cancer waiting list delays, OTDSCs

and delayed discharges. Despite the efforts of highly educated and committed administrators and practitioners, there was a high prevalence of unintended outcomes in NHS and many other HDSs. In this investigation, one of my motivations has been to understand how to minimise OTDSCs and contribute to improving care. As a result, I started by considering the best way to start the research enquiry to provide a reasonable impact on practice. In other words, how can I help patients and communities using this investigation? This emphasis on communicating direct impact to patients became a significant burden, especially in conceiving the best way to start the enquiry and limit the scope of the investigation. Unfortunately, at the start of the research, previous supervisors had little understanding of OTDSCs and realist methodology, plus the descriptive and atheoretical nature of the OTDSCs literature did not provide any useful clues either.

Therefore, I engaged with various interested stakeholders (commissioners, surgeons, anaesthetists, managers and supervisors) and policymakers to help me limit my scope and narrow my research questions, but the consensus was substantially varied. Some experts and policymakers advised taking a more standardised approach and improving preparing patients for surgery by creating a series of protocols, checklists and tools. Consequently, in my initial approach, I consider standardisation as the "universal solution", and explore ways to minimise OTDSCs. However, with the help of the realist approach, I learned that standardisation of care creates many problems in HDSs.

Rather than restricting the scope of the research question to understand interactions between one or two variables, the realist approach encourages embracing the complexity of HDSs. One of the advantages of the realist approach is the development of transferable theories considering the "real world" or close to a "real practice", which can be useful to improve the practice. I overlooked Pawson’s statement that the realist methodology is not for novice researchers (Pawson et al., 2004) and discovered this truth myself during my doctoral studies. However, in practice, a complex phenomenon such as OTDSCs operates in multiple levels, such

as organisational, teams, HCPs, and patients. As a doctoral researcher, untangling interactions at multiple levels has been extremely challenging and time-consuming.

At some points, I had so many CMOCs and If and then statements. On a practical level, it is not feasible to explore multiple interacting factors at different levels within the practical constraints of this study. Sometimes, I spent around a year getting lost and stuck in various loops. Although this is very painful and frustrating, during this period, I learnt a lot about many other theories (production systems and operational management) and methods (generalised linear models) that I did not use in this thesis. After considerable thinking, I have decided to focus on interactions between the patient and HCPs (PONs, anaesthetists, and surgeons) to develop transferable theories, which are remarkable turning points that led to the completion of this thesis. However, scoping the enquiry into micro-level interactions between the patient and HCPs was a very uncomfortable decision. Pawson (2013) argued that any evaluation is limited in its understanding and not feasible to achieve comprehensive interactions of policies and programmes. I am also aware of the variety of unaddressed components that might contribute to the behaviours of various actors, which might influence the findings.

In reflection, my personal journey to writing this thesis was formed by many factors, mostly factors out of my control, which taught me important life lessons. One of the major challenges in commencing my doctoral study was my initial supervisory team's lack of appreciation and limited expertise in realist methodology. Consequently, I was unsure how to manage or deal with critical feedback from individuals who did not appreciate the realist approach or understand the key concepts.

The COVID-19 pandemic also created significant problems for my research and for myself. Moreover, the COVID-19 pandemic also created substantive challenges in delivering the research plan in line with NIHR objectives, because all scheduled surgical work had been abandoned by NHS hospitals. Furthermore, I collected around 70,000 patient-level data related to OTDSCs; early analysis suggested the

OTDSCs rates identified were higher than what organisations reported. Despite the confidentiality, some leaders in NHS trust felt uncomfortable publishing their high OTDSCs rates and decided to withdraw from the study. COVID-19 pandemic made it challenging to continue with further data collections. As a result, I had to negotiate new deliverables with the funder, with very little support. I have decided to convert the study from mixed methods to a qualitative study. Consequently, I have abandoned some of the research questions related to the prevalence of OTDSCs in NHS and which patient cohorts are most likely to report different types of OTDSCs.

When the COVID-19 pandemic started, my daughter was two and a half years old. Due to the closure of nursery facilities, managing childcare while trying to complete doctoral studies was a significant challenge. Although I requested interruptions to study, this was, unfortunately, not feasible. During 2020/2021, most of my doctoral work was completed in the late night and early mornings. During COVID-19, my daughter also suffered from a respiratory condition, which meant that sometimes she could not breathe. Especially in the late autumn and winter months in 2020 and 2021, low temperatures appeared to aggravate and create adverse respiratory problems. Consequently, we have continuously monitored her which meant I rarely slept. On several occasions, I had to call paramedics. On some occasions, she was admitted to the hospital. As a result of all these challenges, I lost nearly 10 kg of my body weight and became weak. It is very painful to look back at some of the events triggered by COVID-19. However, the experience taught me to be kind to myself to take the necessary action but also accept the issues outside my control. I wish the things that happened to me during this period would not happen to anyone as a doctoral student; however, these events taught me to look after my well-being and be kind to others. One of the biggest practical lessons, I learnt from my doctoral studies, is that the generation of knowledge by research can be very subjective, especially in social science. Therefore, it is important to work closely with like-minded and supportive individuals who appreciate my philosophy of research and work.

Although realist methodology helped me to transform my thinking, as a student, and bring enormous benefits, I was unsure how to manage or deal with critical feedback

from individuals who did not appreciate the realist approach, which led to a waste of time and confusion. Like most HDSs, surgical care is still dominated by relative positivists who embrace the "quantitative logic" and randomised control trials. However, the experienced taught me, how to engage and communicate with the wider research community who might not support realist methodology or do not have an appreciation for qualitative approaches.

Managing lots of information from different methods and actors is challenging. One of the biggest challenges was to understand how to limit the scope of the enquiry, especially in the initial stages. Another methodological challenge is that realist enquiry has the ability to continuously evolve; therefore, maintaining transparency was also challenging. This thesis's iterative analysis takes a relatively long time as it consists of five or six iterations and continuously evolves. As a result, my best efforts to exhibit transparency were made challenging by the nature of the realist analysis. From the researcher's perspective, realist investigation is a continuously evolving process, which creates a sense of loss, fear, and anxiety. However, becoming more familiar with the data and understanding the scope of the programme theory helped me to create better CMOCs and models, which I would never have anticipated at the start of the doctoral programme. My learning experience taught me to trust and evolve with the research process and to be open-minded, deal with uncertainty and accept surprises.

To manage the analysis effectively, I have tried using various coding software widely used in qualitative data analysis but found their deductive approaches limit the richness of the analysis and are less fruitful (Bergeron and Gaboury, 2020). Looking back at the process, it is possible I might not have received the appropriate guidance to apply some of the challenges that come across in realist analysis. However, I found simple visual methods, highlighting relevant information related to IPTs using colours and identifying potential information, including dyads and triads (Jackson and Kolla, 2012) and organising relevant quotations in flip charts, very helpful. The humble flip charts helped me to link broader concepts, including behavioural mechanisms and link CMOCs. In particular, the visualisation of flip charts assisted

me in the synthesis of CMOCs and qualitative models and the writing of the findings chapters. Going forward, I will continue to use postal stick notes with different colours to conceptualise and visualise problems and their links to various components in my research, as well as a complex problem-solving tool.

In the initial stages, I had some reservations about using the teacher-learner approach to collect data. However, I found the approach very effective, and especially helpful in keeping interview participants focused. Analysis of 29 interview scripts was a time-consuming task. It was an especially challenging task when the analysis was itself evolving. Looking back at the analysis, in future, I will conduct semi-structured interviews using the teacher-learner method in several stages, which will give me the opportunity to analyse data as I go through the research process and understand the themes and potential CMOCs related to research questions.

Qualitative researchers comprise two main groups: those who feel that software (NVivo) is central to data analysis and those who believe that it is insignificant and can result in the “wrong” kind of analysis (Welsh, 2002). The two methods have different advantages, so researchers are recommended to consider both(John & Johnson, 2000; Welsh, 2002). Some published studies have used a manual approach to data analysis (McConnell & Porter, 2017). Even in a recent communication in the RAMESES email list, many researchers admitted to using manual paper-based methods, including Ray Rawson (2024), who pioneered realist evaluation. However, in recent years, several papers have been published on using software-based methods (such as NVivo) in realist reviews to improve their transparency (Bergeron & Gaboury, 2020; Dalkin et al., 2021).

Although I have attempted to use software approaches, they tend to limit my ability to identify various patterns and interactions and make me think in habitual patterns acquired from my life science training based on experimental evaluation (Marchal et al., 2013; Nielsen et al., 2023). Looking back at the analysis undertaken, one of the biggest problems with using software was that I did not have a clear analytical

framework at the beginning of my investigation. Indeed, several analytical frameworks emerged during the iterative analysis, and I decided to use one framework at the end (refer to figure 3.6-1). However, I found a paper-based approach supported by flip charts (see appendices 3.6.2, 3.6.3-1, and 3.6.3-2) very helpful, especially in developing transferable theories and models. In future studies, I plan to use an existing (Greenhalgh et al., 2017; Shearn et al., 2017; Walton, 2014) or developed framework based on the study, and I am very keen to use both software and paper approaches.

Learning and applying realist methodology is a challenging and ongoing process for most novice researchers; the realist investigation has expanded my mindset and broadened my conceptualisation of analytical skills. I feel honoured to learn a methodology that expands my intellectual capacity and problem-solving ability, and grateful to the individuals involved in developing it. I hope to use these skills in problem-solving in the workplace and in my future research.

8.12 Chapter summary

The discussion chapter covers many areas of the research enquiry. Firstly, it summarises the realist investigation by explaining the five study phases. Secondly, the findings of the realist investigation include transferable explanations of how to minimise OTDSCs due to clinical reasons, including discussing relevant literature. Using the findings of the OTDSCs, the chapter presents a transferable explanation of how the interaction between standardisation and individualisation of care minimised unintended outcomes. The next section discusses strengths, weaknesses and limitations, and future research that emerged from the study. Finally, the chapter ends with a summary of the personal reflections. The next chapter summarises the answer to the research questions set up in Chapter 1, as well as this thesis' contribution to knowledge and implication to practice.

9 Conclusion chapter

9.1 Introduction to Conclusion Chapter

This last chapter answers the research questions set out in Chapter 1 and discusses the implications for policy and practice. This theoretical and empirical study used multiple methods to consider a complex and important topic that has drawn worldwide attention: how to minimise unintended outcomes in HDSs? The realist investigation consisted of five phases, and the study design was based on a pre-registered protocol.

Phase one of the study developed its research aims, questions, and design and presented in Chapter 1. In phase two, as highlighted in Chapter 4, the study developed four IPTs using multiple methods and prioritised IPT one. The multiple methods included the following: carefully selected samples of OTDSC literature (n=35), findings on the feasibility study included results from eight NHS trusts, two feedback events with patient expert advisers (n=6), and eight expert practitioners (n=8). In phase three, as highlighted in Chapters 5 and 6, IPT one is further refined, and developed CMOCs using interview data. Chapter 7 (phase four) used evidence from the literature to further refine the findings from phase three. As highlighted in the discussion chapter, Chapter 8, phase five brings all the evidence from all four phases, further refines IPT one, and synthesises a programme theory on minimising OTDSCs due to clinical reasons. Using all the evidence, this conclusion chapter explains the primary research questions set in Chapter 1 and the implications for policy and practice.

The chapter is structured as follows. Firstly, it answers each of the study's research questions, summarising the work of the thesis as a whole. Secondly, it highlights the contribution to knowledge this thesis makes in understanding and minimising OTDSCs. Thirdly, it discusses the implications to practice and policy, including recommendations emerging from the study that target different actors in the healthcare economy, such as policymakers, hospital leaders, HCPs, and researchers. Synthesising the evidence and theory, the thesis also develops a

reporting tool to categorise OTDSCs that can play a useful role in minimising OTDSCs.

9.2 Answering research questions

Encapsulating the work of earlier chapters and different phases of the study in answering each research question one by one, this section delineates and summarises the thesis' answers to the four research questions (RQ1 to RQ4) set up in Chapter 1.

9.2.1 RQ1. How to categorise On-The-Day Surgery Cancellations that can be used in a wide range of Scheduled Surgical Care systems?

The iterative analysis identified that three different types of actors appear to initiate OTDSCs: clinicians, patients, and administrators (refer to section 4.8).

Clinicians initiate OTDSCs – When a patient is not prepared for the surgery for clinical reasons, clinicians (e.g., surgeons and anaesthetists) who review the patient before the surgery tend to initiate OTDSCs for clinical reasons due to failure to manage clinical risks. OTDSCs, for clinical reasons, are one of the most widely reported reasons for cancellations A wide range of clinical care planning limitations or failures leads to OTDSCs for clinical reasons. This category included reasons such as patient medication was not managed or stopped (e.g., anti-coagulant medication), patient co-morbidities not managed (e.g., anaemia, hypertension), patients' relevant tests are not completed or available (e.g., blood tests, X-ray), and patient allergies (e.g., latex, antibiotic) were not identified. The clinicians who reviewed the patients' clinical readiness to initiate OTDSCs for clinical reasons believed that proceeding with the surgery could lead to clinical risks during or after the surgery. Example include, failure to identify and manage clinical risks such as co-morbidities (e.g., cardiac, respiratory, and hypertension), failure to manage medication (e.g., anti-coagulant) or unavailability, diagnostic test results (e.g., a blood or urine test and X-ray) or failure to identify allergies (e.g., antibiotic and latex allergies).

Administrators initiate OTDSCs – When a patient is about to go for surgery, different administrators (matrons and bed or theatre managers) review whether they have adequate resources (e.g., post-operative beds, theatre time, HCPs to conduct the surgery, and equipment) to carry out the surgery. When the relevant administrators do not have the resource that they are responsible for, they tend to initiate OTDSCs due to resource unavailability. For example, the theatre matron is responsible for providing physical (i.e., theatre equipment) or personnel resources (i.e., theatre practitioners or anaesthetists). However, when the theatre matron cannot provide specific resources to complete the surgery based on patient resource needs, they are likely to initiate OTDSCs due to the unavailability of resources. Likewise, a bed manager or hospital manager responsible for providing the specific type of post-operative beds required by the patients (e.g., critical care, paediatric, inpatients or day case) may fails to provide these resources on-the-day of surgery. based on patients' needs to complete the surgery. Consequently, the administrator (i.e., bed manager or hospital manager) initiates OTDSCs due to resource unavailability.

Administrators initiate OTDSCs due to failure to schedule specific resources before the surgery or deliver the scheduled resources. The OTDSCs initiated by administrators include the unavailability of a wide range of physical resources (e.g., different types of post-operative, theatre equipment, sterile kit, theatre space and time) or personnel (e.g., surgeons, anaesthetists, nurses, and theatre practitioners).

Patient-initiated OTDSCs – When patients' communication needs are not addressed , the patient initiates OTDSCs, including DNA, and the patient fails to provide consent and decides not to undergo surgery.

Taxonomy of OTDSCs summarises how different types of OTDSCs categorised

The analysis of multiple types of evidence identified the inadequate level of various aspects of individualisation of care – clinical care planning, communication, and

scheduling – initiates different types of OTDSCs. Based on the findings and incorporating the answer for RQ1, the following three transferable theories have been developed to explain the taxonomy of different types of OTDSCs.

I. Inadequate level of individualisation of care concerning the clinical preparation of the patient undergoing surgery can lead to OTDSCs initiated by clinicians for clinical reasons (e.g., failure to manage clinical risks such as co-morbidities -cardiac, respiratory, hypertension or medication, such as anti-coagulant) or identify allergies.
II. Inadequate level of individualisation of care concerning the provided resource of the patient undergoing surgery can lead to OTDSCs initiated by administrators due to resources (e.g., beds, surgeons, theatre time and equipment).
III. Inadequate level of individualised care related to patient communication; they (i.e., patients) tend to initiate OTDSCs due to DNA or failure to provide consent or undergo surgery.

The following three transferable theories were identified as part of the IPT theory development (section 4.8), developed from the literature from different care settings (e.g., different types of hospitals from different countries) and feedback from patient advisors and expert practitioners. Incorporating the following three transferable theories, a taxonomy of OTDSCs explains how different types of OTDSCs are categorised in a wide range of SSCS. The taxonomy (figure 4.8 -1) was first presented in Chapter 4, in section 4.8. The following three transferable theories were further refined using qualitative interviews (section 5.4). with a variety of healthcare actors in different NHS organisations. The synthesis of the taxonomy was strengthened using multiple evidence from a wide variety of healthcare settings and a variety of healthcare actors in different NHS organisations.

The OTDSCs taxonomy provides a contribution to knowledge by explaining how different types of OTDSCs are influenced by different aspects of individualisation of care.

9.2.2 RQ2. How and in what contexts minimised OTDSCs due to clinical reasons?

The healthcare system, including SSCSs, appears to be designed with the underlying linear assumption that the standardised interventions (e.g., clinical protocols, assessments, and checklist) and other standardised care approaches (e.g., standard time in 10 or 15 minutes, using standard terminology, and standard targets) create intended outcomes. However, in practice, various contexts – macro, meso, and micro – influence relevant actors' behaviours, which can create intended and unintended outcomes. In practice, each patient's clinical and social needs are unique and unlikely to find a standard patient (Lydahl, 2021; Rycroft-Malone et al., 2009). When care is delivered by PONs using standardised clinical care planning interventions, failure to address individualised care concerning clinical care planning leads to OTDSCs for clinical reasons.

The analysis identified interconnected components as contributing to minimising OTDSCs due to clinical reasons: standardised clinical care planning interventions, adequate levels of PONs clinical autonomy, an inter-professional collaboration between the anaesthetist and PONs, individualisations of care concerning clinical care planning, behavioural mechanisms among PONs (i.e., compassion, self-efficacy and situational awareness), and clinicians (i.e., trust in patients' clinical preparation). Therefore, the extent to which OTDSCs due to clinical reasons are minimised depends on the ability of all these interconnected components to work together successfully.

The following contexts minimised OTDSCs happening for clinical reasons: an adequate level of clinical autonomy among PONs, individualisation care of patients concerning clinical care planning, interprofessional collaboration and adequate time to complete the clinical consultation. However, these contexts work interconnectedly to minimise OTDSCs happening due to clinical reasons. For example, an adequate level of clinical autonomy among PONs appears to provide the context for PONs to deliver a sufficient level of individualisation care of patients concerning clinical care planning for patients undergoing surgery. Furthermore, interprofessional

collaboration and adequate time to complete the clinical consultation appear to lead to adequate clinical autonomy among PONs.

The extent of minimising OTDSCs due to clinical reasons depends on the ability to activate behavioural mechanisms by the contexts among healthcare actors. Adequate levels of clinical autonomy among PONs appear to activate the following behavioural mechanisms among PONs: compassion, self-efficacy, and situational awareness. Consequently, this leads to adequate levels of individualisation of care in clinical preparation and minimised OTDSCs due to clinical reasons. Subsequently, adequate levels of individualisation of care in clinical preparation lead to trust in the clinical preparation of anaesthetists who review patients before surgery, resulting in a positive decrease in OTDSCs due to clinical reasons.

9.2.3 RQ3. How can a programme theory be used in a wide range of SSCSs to minimise OTDCSs due to clinical reasons?

The realist investigation synthesised a programme theory to minimise OTDCSs due to clinical reasons and was completed using different types of evidence from different care settings. For example, literature used in this investigation from different types of hospital settings (e.g., veterans' hospitals, specialists, district general, community and universities) from different countries. The empirical data also used a wide range of healthcare actors (e.g., surgeons, anaesthetists, patients, and managers) from different care settings.

Although there is a perception that OTDSCs are a problem related to OTs, this could be because OTDSCs usually occur in close proximity to OTs; however, preparing patients for surgery by addressing individual clinical care needs plays an important role in minimising OTDSCs for clinical reasons. OTDSCs, due to clinical reasons, are linked to preparing patients for surgery and cover a wide range of reasons (refer to sections 4.2, 4.4 and 8.2.1). PONs play a vital role in preparing patients for surgery by addressing their clinical needs. However, on the day of the surgery, clinicians who reviewed the patients before the surgery initiate OTDSCs due to clinical reasons when patients undergoing surgery have inadequate level of clinical care preparation,

This is because failure to prepare the patient clinically for surgery adequately can result in harmful complications peri- or post-operatively. Therefore, OTDSCs due to clinical reasons can be an important safety measure taken by clinicians to avoid any harm during or post-surgery.

OTDSCs due to clinical reasons therefore appear to be a result of complex interactions between standardisation and individualisation of care. One of the sub-groups of standardisations of care is standardised interventions, which play a vital role in preparing patients for surgery and minimising many types of OTDSCs, including for clinical reasons. In practice, the standardised clinical care planning interventions, standard terminology, and standard time for clinical consultations play a vital role in preparing patients for surgery and influence PONs behaviours. Although there is a lot of emphasis on standardisation of care, individualisation care aspects (i.e., individualisation of care concerning clinical care planning) are essential in minimising OTDSCs due to clinical reasons.

Failure of clinical care planning standardised interventions (i.e., pre-assessment protocol or tool) create an inadequate level of individualisation of care concerning clinical care planning for patients undergoing surgery, which appeared to provide the contexts to OTDSCs due to clinical reasons. By contrast, when clinical care planning standardised interventions create an adequate level of individualisation of care concerning clinical care planning, appeared to provide the contexts to minimised OTDSCs due to clinical reasons. Therefore, both standardisation and individualisation of care are important to minimising OTDSCs due to clinical reasons.

The PONs involved in preparing patients (i.e., pre-operative care) for surgery play an influential role in minimising a wide range of OTDSCs, including OTDSCs due to clinical reasons. Usually, PONs prepare patients undergoing surgery using various standardised clinical care planning interventions and approaches. When delivering care using standardised clinical care planning interventions, adequate levels of clinical autonomy among PONs appear to activate the following behavioural

mechanisms among PONs: compassion, self-efficacy, and situational awareness. Consequently, this leads to adequate levels of individualisation of care in clinical preparation and minimised OTDSCs due to clinical reasons. Subsequently, adequate levels of individualisation of care in clinical preparation lead to trust in the clinical preparation of anaesthetists who review patients before surgery and result in minimising OTDSCs. Under the discussion chapter, figure 8.3-1 provided a graphical presentation of the transferable theory of how to minimise OTDSCs.

OTDSCs, due to clinical reasons, are a result of a chain of reactions consisting of interconnected components with varying contexts and behavioural mechanisms. Therefore, there is no panacea to minimise them. Providing adequate clinical autonomy for PONs can be vital to start a chain of reactions, including minimising the tension between standardisation and individualisation of care and creating adequate individualised care related to clinical care planning. Consequently, this leads to minimising OTDSCs due to clinical reasons.

9.2.4 RQ4. How and in what contexts do the interactions of standardisation and individualisation of care influence unintended outcomes in HDSs?

The investigation found that unintended outcomes (i.e., OTDSCs due to clinical reasons) were a result of interactions between standardisation and individualisation of care. For example, the inability of standardised clinical care planning interventions – one of the sub-groups of standardisations of care – create an adequate level of individualised care concerning the clinical care planning provides the context to create OTDSCs due to clinical reasons. By contrast, in some contexts, when standardised clinical care planning interventions create an adequate level of individualised care concerning, clinical care planning provides the context to minimised OTDSCs and other unintended outcomes (e.g., delayed discharges and start theatre on time)

Modern HDSs rely on standardisation of care approaches, including standardised interventions and standard time to complete clinical consultation, to minimise unintended outcomes and improve quality in HDSs. The results of the OTDSCs investigation suggest inner workings of standardised care are far from linear. The ability of standardisation of care to minimise unintended outcomes by creating a chain of events consisting of several interconnected components, aspects of individualisation of care, including contexts (e.g., inadequate clinical autonomy in HCPs, unfavourable working conditions) and behaviours (e.g., compassion and trust among HCPs). Sometimes, mechanisms working with contexts create outcomes that provide context to another mechanism (e.g., individualisation of care). In other words, standardisation and individualisation of care play an important role in this chain of events, minimising unintended outcomes.

The results from OTDSCs due to clinical reasons suggested that unintended outcomes appear to be a result of the inability of standardisation of care and individualisation of care to work together in delivering care and include several interconnected components, including contexts (e.g., inadequate clinical autonomy in HCPs and unfavourable working conditions) and behaviours (e.g., compassion and trust among HCPs). Therefore, in care delivery, it is important to manage a judicious balance between the standardisation and individualisation of care to minimise unintended outcomes. The extent to which the interactions of standardisation and individualisation of care minimise unintended outcomes depends on several contexts or conditions, as well as the ability to activate behaviours.

The realist investigation makes a novel contribution to knowledge by identifying mechanisms that explain how the interactions of standardisation and individualisation of care minimise unintended outcomes and improve healthcare quality in HDSs. The behavioural mechanisms, namely, compassion, self-efficacy and situational awareness, among actors activated by the clinical autonomy of the clinical actors play a vital role in the ability of standardisation and individualisation of care to work together. Furthermore, trust among clinical team (e.g., anaesthetist and surgeon) patients' clinical preparations is another mechanism activated by

individualisation of care concerning clinical care planning, helping to minimise unintended outcomes.

Another novel contribution to knowledge made by the thesis is in what contexts and how the interactions of standardisations and individualisation of care minimise unintended outcomes. The ability of standardisation of care to deliver individualisation of care might depend on the HCPs' ability to exercise an adequate level of clinical autonomy. By contrast, an inadequate level of clinical autonomy and individualisation of care leads to unintended outcomes. Therefore, clinical autonomy provides an important context to minimise unintended outcomes in HDSs. The HCP's ability to exercise an adequate level of clinical autonomy of the HCPs depends on several contexts: inter-professional collaboration and adequate time for clinical consultation.

When care is delivered using standardisation of care, clinical autonomy among HCPs is a condition that plays a vital role in activating behavioural mechanisms (i.e., compassion, situational awareness, and self-efficacy) in HCPs. This creates a chain of events that helps to achieve individualisation of care. The individualisation of care provides important context to activate trust mechanisms among various actors to minimise unintended outcomes.

9.3 Implication to practice and policy

The thesis findings have implications for practice in two areas: understanding and how to minimise OTDSCs due to clinical reasons; and understanding the interaction between the standardisation and individualisation of care to minimise unintended outcomes and improve healthcare quality in HDSs.

9.3.1 Recommendations on how to minimise OTDSCs due to clinical reasons

OTDSCs are a widely acknowledged unintended outcome that create significant suffering for patients and carers, and substantial waste in HDSs. The cost of lost OT

time due to OTDSCs might be as high as £400 million per year in NHS in the UK (Gillies et al., 2018). The findings of this study therefore have important implications that can minimise OTDSCs in general and OTDSCs due to clinical reasons. The recommendations are emerging from the findings on how to minimise OTDSCs focused on four types of influential actors in HDSs: policymakers, hospital leaders, HCPs, and researchers.

Policymakers

Due to the enormous waste, patient suffering, and the negative impact of waiting lists, the temptation among policymakers and politicians to find and implement a panacea or magic bullet to minimise OTDSCs is understandably high. Policymakers in many countries have focused on providing strict performance targets consisting of OTDSCs rates to minimise them (Chiu et al., 2012; Macario, 2006).However, OTDSCs are a safety measure used by several types of actors, including clinicians. Therefore, policymakers need to exercise caution before introducing and managing such performance targets that can lead to patient harm. Instead, policymakers can encourage leaders to investigate OTDSCs as quality incidents to learn from incidents and understand the underlying contributors using various system incident analysis techniques.

Policymakers strongly emphasise improving SSCSs using the standardisation of care, especially in pre-operative care. It is possible planned care nature may have some similarities with factory-like systems (pre-operative hubs). Standardisation of care has substantial benefits, but focusing only on standardisation is unlikely to minimise OTDSCs. Therefore, policymakers need to look beyond standardisation or one-size-fits-all approaches. Policymakers need to target policy and improve both standardisation and individualisation of care of patients undergoing surgery, creating a favourable working environment that activates behaviours such as self-efficacy, compassion, trust, and situational awareness among healthcare actors to minimise OTDSCs.

Hospital leaders

When using standardised interventions to prepare patients for surgery, an adequate level of clinical autonomy among nurses leads to prepare patients for surgery and appears to improve various aspects of the condition to improve individualisation of care. The empirical work and literature suggested that PONs in England struggle with inadequate clinical autonomy due to unfavourable organisation contexts (i.e., high workload and interruption of clinical work). Evidence from other developed countries also highlighted that nurses preparing patients for surgery negatively impact by unfavourable working conditions (Björn et al., 2017; Denholm et al., 2020; Sillero-Sillero and Zabalegui, 2020). Therefore, this thesis recommends providing an adequate level of clinical autonomy for PONs or similar roles to achieve individualisation of care. Hospital leaders must be actively involved with PONs or similar roles to identify how to improve and minimise unfavourable working conditions and clinical autonomy.

Standard clinic time is given to a wide variety of HCPs (GPs, nurses), especially in the NHS, and is a widely used common practice to improve waiting lists. In practice, standardised interventions, standard clinic time and various unfavourable conditions appear to have a negative impact on clinical autonomy, especially for PONs. Consequently, this leads to an inadequate level of individualisation of care. In a real care setting, you cannot find either “standard” patients or PONs. The clinical consultation focuses on individualisation of care, not completing standardisation interventions in standard time. Therefore, providing some flexibility for the time or other resources in consultation with PONs is recommended to improve the clinical consultation and prepare for a patient’s surgery.

Inter-professional collaboration between the anaesthetists and nurses preparing patients for surgery is likely to minimise OTDSCs, especially related to clinical reasons. Failure to clinically prepare patients for surgery might lead to scheduling resources. Consequently, this leads to OTDSCs due to the unavailability of resources. However, due to workforce shortages, the collaborative work of PONs and anaesthetists appears to be negatively impacted.

Creating feedback loops between the PONs and anaesthetists is crucial to minimise OTDSCs and improve pre-operative care. Here are a few suggestions to improve close collaboration between the anaesthetists and PONs to improve the knowledge transfer and minimise OTDSCs due to clinical reasons:

- Regular educational events to discuss OTDSCs for clinical reasons to understand the clinical expectations of anaesthetics with PONs and ways to improve the preparation of patients for surgery.
- Create a one-stop pre-operative care clinic that provides the opportunity for anaesthetists and PONs to work together to improve the pre-operative care.
- Group mentoring support from anaesthetists to PONs to improve pre-operative care and expectations.

The use of standardisation of care dominates in SSCSs (Leotsakos et al., 2014; Rozich et al., 2004; Hovlid et al., 2013). Evidence also suggested that standardisation of care, including standardised interventions, can help minimise OTDSCs in various organisations. (Knox et al., 2009; Torres et al., 2020; Varughese et al., 2013; Pratap et al., 2015; Schretlen et al., 2021b). However, in some contexts, the use of standardised interventions can also create unintended outcomes, including OTDSCs. It is important for hospital leaders to understand that standardisation of care is not a “universal solution”. Therefore, hospital leaders’ mindsets need a shift to focus on standardisation as well as individualisation of care, especially designing and managing SSCSs.

OTDSCs depend on several interconnected components, including PONs or similar roles and behaviours, not just standardised interventions. It is vital to consider standardisation and individualisation of care when preparing patients. In addition to the standardisation of care, hospital leaders need to focus on creating adequate clinical autonomy among PONs or similar roles to activate behaviours such as self-efficacy, compassion, trust, and situational awareness among healthcare actors to minimise OTDSCs. Therefore, it is recommended to use a series of interconnected

standardised interventions and different aspects of individualisation of care, targeting various stages of the care processes and actors to minimise different types of OTDSCs.

OTDSCs are a multi-factorial phenomenon resulting from several reasons influenced by various contexts, such as organisational culture, policy, and patient populations. What works in other countries, or other organisations in the same health economy, may not necessarily work with in other contexts, but may still be useful. Therefore, it is important to create evidence-informed practices and interventions based on organisational contexts on how to minimise OTDSCs.

HCPs

It is important to understand and be fully aware of the impact of standardisation of care and how unfavourable organisational contexts negatively impact on clinical autonomy related to PONs and similar nurse roles, especially in pre-operative care settings. Despite the various sub-systems (nurse-led clinics and pre-operative hubs managed by nurses), it is important that HCPs work in a multi-disciplinary environment where there exists inter-professional collaboration, especially between the PONs or similar roles with anaesthetists.

Researchers

The global prevalence of surgical case cancellation on the scheduled day of surgery was 18% (Abate et al., 2020). However, very few comprehensive studies have been completed in the area. Most studies that used a quantitative approach are limited to how standardised interventions can be implemented to minimise OTDSCs focused on single-centre evaluation. In this era, most countries in the world are struggling with enormous waiting lists for scheduled surgical care, so it is vital to research communities focused on reducing the enormous waste and patient suffering due to OTDSCs. Future studies can use qualitative methods (i.e., ethnography and incident

analysis) and comparative studies to develop transferable theories to minimise OTDSCs.

9.3.2 OTDSCs reporting tool

One of the first steps to minimise OTDSCs is to categorise OTDSCs in a meaningful way that can be linked to the care process or pathway. In this way, leaders can understand which areas in the care pathway need to improve to minimise OTDSCs. Considering all the evidence, the thesis presents a reporting tool (figure 8.2-1) that indicates the problems linked to care pathways or processes.

C.0 - Initiated by clinicians due to patients' clinical risks not being identified and/or managed before the surgery	C.1 - Patient medication was not managed or stopped. (e.g., anti-coagulant medication)
	C.2 - Patient co-morbidities not managed (e.g., anaemia and hypertension)
	C.3 - Patients' relevant tests are not completed or available (e.g., blood tests and X-ray)
	C.4 - Patient allergies (e.g., latex and antibiotic) were not identified
A.0 - Initiated by administrated responsible for providing resources on the day of surgery	A.1 - Unavailability of resources due to failure to allocate
	A.1.1 - Post-operative bed daycase
	A.1.2 - Post-operative bed Inpatient
	A.1.3 - Post-operative bed critical care
	A.1.4 - Theatre time
	A.1.5 - Other resources
	A.1.6 - Healthcare professionals
	A.1.7 - Theatre equipment
	A.1.8 - Other resources that does not come under any resource type (e.g., medication)
	A.2 - Unavailability of resources due to failure to deliver

	A.2.1 - Post-operative bed daycase
	A.2.2 - Post-operative bed inpatient
	A.2.3 - Post-operative bed critical care bed
	A.2.4 - Theatre time
	A.2.5 - Other resources
	A.2.6 - Healthcare professionals
	A.2.7 - Theatre equipment
	A.2.8 - Other resources
P.0 - Initiated by patients due to inadequate	P.1 - Did Not Attend (DNA)
	P.2 - The patient did not follow pre-operative or pre-admission instructions
	P.3 - Patient failed to provide consent
	P.4 - Patient needs more time to think about side effects
	P.5 - Patient has carer/childcare responsibility

Figure 9.3-1 OTDSCs reporting tool.

The categorisation consists of three actors who initiate OTDSCs: administrators (A.0), clinicians (C.0), and patients (P.0). OTDSCs initiated due to clinicians were divided into four explanations or reasons (C.1 to C.4), while patient-initiated OTDSCs were divided into five reasons (P.1 to P.5). The administrator-initiated OTDSCs (i.e., unavailability of resources) can be further split into two main branches related to failure to allocate: (A.1) resources as preparation of patients for surgery and (A.2) delivery resources. Each branch is further parted into eight branches or reasons depending on the resource (A.1.1 to A1.8 and A.2.1 to A.2.8).

The evidenced-informed OTDSC reporting tool has many advantages for healthcare organisations. The OTDSC reporting tool can be used as a diagnostic tool to understand the limitations and weaknesses of scheduled care pathways or processes that investigate different types of OTDSCs. The reporting tool enables categorising OTDSCs in a meaningful and systematic way to improve specific organisational processes by differentiating the preparation of patients for surgery from care delivery problems (i.e., category two) from the failure of preparing patients for surgery (i.e., category one) in the following areas: care planning, care communication, and scheduling. For example, OTDSCs, due to resource unavailability because of resource delivery problems related to capacity and demand or patient flow, can be identified in A-2. By contrast, PONs failure to allocate resources can be identified under A.1. Where necessary, using sub-categories, managers can identify specific issues such as failure to allocate theatre time (A.1.4) or post-operative critical care bed type (A.2.3). Where necessary, hospitals can use the tool as a framework and adopt it by adding further sub-categories, such as different types of unavailability of healthcare professionals or beds or equipment based on the local contexts.

9.3.3 Recommendation on how to minimise undesired outcomes

Modern healthcare policy and practice is dominated by standardisation of care: standardised interventions (e.g., protocols and checklist), clinical terminology, care pathways, process and outcome targets and algorithms. Clinical areas are heavily

standardised in practice, including the HCP's roles and responsibilities to minimise unintended outcomes and improve quality.

According to policymakers and leaders, the standardisation of care seems like the universal solution to minimise unintended outcomes in HDSs. The findings from the realist investigation challenge this widely-held view among policymakers and leaders and demonstrates how, in some contexts, the standardisation of care creates unintended outcomes such as OTDSCs due to clinical reasons, delayed discharges, and theatre delays in SSCS. Therefore, this study's findings caution policymakers using standardisation of care as a universal solution to minimise unintended outcomes and improve quality in HDSs.

The analysis highlighted that standardisation provides several ways and advantages to minimise unintended outcomes such as OTDSCs. Failure to achieve certain aspects of individualisation of care leads to unintended outcomes such as OTDSCs, delayed discharges and delayed starting theatres. Therefore, both standardisation and individualisation are important to minimise unintended outcomes. Indeed, the findings from the OTDSCs highlighted that both the standardisation and individualisation of care play an important role in minimising unintended outcomes. Therefore, policymakers are recommended to consider how both standardisation and individualisation of care can be utilised in healthcare settings to minimise unintended outcomes in care delivery.

The findings highlighted that the clinical autonomy of HCPs plays an important role in influencing unintended outcomes. An insufficient or inadequate ability to exercise clinical autonomy appears to lead to unintended outcomes. By contrast, adequate ability to exercise clinical autonomy appears to minimise unintended outcomes. In practice, the analysis suggests that the care delivery of standardised interventions can be summarised in two ways. When there is not enough time or unfavourable organisational contexts (high workload, interruptions work), HCPs can deliver care using standardised interventions to complete the mandatory documentation (i.e.,

‘ticking all the boxes’). This might lead to unintended outcomes, because of inadequate clinical autonomy. Alternatively, HCPs can use their clinical autonomy and standardised interventions to make various decisions to deliver care based on patient needs. The second approach emphasised patient needs more and used standardised intervention as a guide. The second approach is vital to minimise unintended outcomes when delivering care because finding ‘standard patients’ with diverse clinical and socio-economic needs is extremely challenging.

When HCPs work in favourable organisational contexts – interprofessional collaboration, adequate workload, and have enough time to conduct a clinical consultation – they are most likely to exercise their clinical autonomy. Consequently, activating compassion, self-efficacy and situational awareness among HCPs leads to minimising unintended outcomes and improves the quality of HDSs. In HDSs all over the world, millions of interventions based on the standardisation of care are completed in care delivery. Policymakers and leaders need to pay attention to policies that adequately excise the clinical autonomy of HCPs and improve activating compassion, self-efficacy, and situational awareness to minimise unintended outcomes and improve quality.

9.4 Conclusion

Reasonably high unintended outcomes (e.g., hospital-acquired infections, delayed discharges, wrong diagnosis, surgery cancellations) are a global problem. Using a realist methodology and incorporating a wide range of evidence, the thesis explored one of the most commonly reported unintended outcomes, OTDSCs, with the view to minimising them.

This thesis makes a novel contribution to knowledge by developing a transferable theory explaining the interactions between the standardisation and individualisation of care on minimising unintended outcomes in HDSs. Although there is much emphasis on various standardised approaches, the realist investigation found that clinical autonomy among healthcare actors and behavioural mechanisms (i.e.,

compassion, self-efficacy, and situational awareness) leads to improved individualisation of care and minimised unintended outcomes. The thesis contributes to knowledge by understanding the relationship between individualisation of care and clinical autonomy among healthcare actors, behavioural mechanisms (i.e., compassion, self-efficacy, and situational awareness),

The thesis makes recommendations for minimising OTDSCs, targeting influential actors in the healthcare economy, such as policymakers, hospital leaders, HCPs, and researchers. The thesis' findings have the potential to minimise OTDSCs and other unintended outcomes for any patient undergoing care and minimise the waste of healthcare resources. The investigation developed an OTDSC reporting tool that has the potential to minimise OTDSCs further and provide a practical output for HCPs to use. One of the main recommendations emerging from the study cautions policymakers on overreliance on the standardisation of care to minimise undesired outcomes instead of maintaining the judicious balance between standardisation and individualisation of care delivery in HDSs.

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