

Article

Testing Realist Programme Theories on the Contribution of Lean Six Sigma to Person-Centred Cultures: A Comparative Study in Public and Private Acute Hospitals

Seán Paul Teeling ^{1,2,*} , Deborah Baldie ^{2,3}, Ailish Daly ⁴, Anthony Pierce ⁴, Nicola Wolfe ⁴, Gillian Fagan ⁴ and Catherine Garry ⁴ 

¹ UCD Centre for Interdisciplinary Research, Education & Innovation in Health Systems, School of Nursing, Midwifery & Health Systems UCD Health Sciences Centre, D04 VIW8 Dublin, Ireland

² Centre for Person-Centred Practice Research Division of Nursing, School of Health Sciences, Queen Margaret University, Queen Margaret University Drive, Musselburgh EH21 6UU, UK

³ Research and Practice Development, NHS Grampian, Aberdeen AB25 2ZN, UK

⁴ Beacon Hospital, Beacon Court, Bracken Rd, Sandyford Business Park, Sandyford, D18 AK68 Dublin, Ireland

* Correspondence: sean.p.teeling@ucd.ie

Abstract

Person-centred cultures are increasingly recognised as essential to the delivery of compassionate, safe, and effective healthcare. While Lean Six Sigma (LSS) is widely adopted as a process improvement methodology, its application is often critiqued for lacking alignment with relational or values-based care. This study aimed to test the transferability of three previously developed Programme Theories (PTs), generated through realist inquiry in a public hospital setting, within a large private acute hospital. Realist-informed adjudication workshops were conducted with interdisciplinary staff who had completed university-accredited training in LSS. Structured workbooks, visual artefacts, and thematic synthesis were used to identify how context–mechanism–outcome configurations (CMOCs) held, shifted, or evolved in the new setting. All three PTs were confirmed, with six CMOCs refined, and eight new configurations generated. Key refinements included the role of strategic intent, informal improvement communities, and intrinsic motivation. These findings suggest that values-based mechanisms underpinning person-centred LSS are not confined to public systems and may be equally active in private settings. The study confirms the explanatory strength of the original PTs while contributing new insights into their adaptability. It offers practical guidance for healthcare leaders seeking to embed person-centred improvement approaches across diverse systems, regardless of sectoral funding or governance structures.

Keywords: Lean Six Sigma; person-centred cultures; realist evaluation; programme theory; healthcare improvement; private and public hospitals



Academic Editor: Francisco Epelde

Received: 27 July 2025

Revised: 29 August 2025

Accepted: 1 September 2025

Published: 4 September 2025

Citation: Teeling, S.P.; Baldie, D.; Daly, A.; Pierce, A.; Wolfe, N.; Fagan, G.; Garry, C. Testing Realist Programme Theories on the Contribution of Lean Six Sigma to Person-Centred Cultures: A Comparative Study in Public and Private Acute Hospitals. *Hospitals* **2025**, *2*, 23. <https://doi.org/10.3390/hospitals2030023>

Copyright: © 2025 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Modern healthcare systems are under increasing pressure to deliver safe, timely, and high-quality care while remaining responsive to the needs of both patients and staff [1]. In response, process improvement methodologies such as Lean and Six Sigma have gained prominence [2,3]. Lean aims to streamline processes and eliminate waste, while Six Sigma focuses on reducing variation and ensuring quality control. Their integration as Lean Six Sigma (LSS) has been widely adopted across healthcare systems seeking to improve efficiency, safety, and reliability [3,4].

However, despite the growing use of LSS, there remains limited understanding of how it can be applied in ways that meaningfully support person-centred practice. Much of the literature continues to focus on technical outcomes such as patient flow, waiting times, or documentation burden. Less attention has been paid to the relational and cultural dimensions of improvement [5]. Specifically, the potential for LSS to shape or enable person-centred cultures, those defined by respectful, collaborative, and inclusive care, is under-explored. While some studies suggest positive experiences for staff or patients, few explore whether such improvements are actually perceived as person-centred or whether they contribute to broader, values-based cultural change within healthcare systems [5–7].

To address this gap, a realist-informed inquiry was undertaken in a large public hospital, comprising a realist review and realist evaluation. This earlier work explored how LSS, when taught and practised through a person-centred lens, contributes to the development of person-centred cultures in acute care settings [7,8]. From that inquiry, three Programme Theories (PTs) were developed, each comprising a series of context–mechanism–outcome configurations (CMOCs) to explain how LSS shaped staff engagement, relational practice, and improvement culture [7]. These PTs later informed the development of the Person-centred Lean Six Sigma (PCLSS) model, a practice-oriented framework designed to support healthcare staff in applying LSS in values-driven and relational ways [8]. However, this paper does not evaluate the PCLSS model. Rather, it tests the explanatory strength and transferability of the original Programme Theories in a different organisational setting. Specifically, this paper reports on a realist-informed evaluation that tested the three PTs in a large private acute hospital. It investigates whether the same generative mechanisms and outcomes observed in the public hospital setting are recognisable, constrained, or refined when applied in a different sectoral context. In doing so, the study contributes to the ongoing development and testing of realist Programme Theories at the intersection of Lean Six Sigma and person-centred cultures.

This study took place in the Irish healthcare system, where acute hospital care is delivered across three organisational types: public hospitals operated by the Health Service Executive (HSE); voluntary public hospitals, which are predominantly state-funded but governed by private boards or religious institutions; and fully private hospitals, which operate independently of the state and receive no public funding [9]. While both HSE and voluntary hospitals are considered public and operate with little functional distinction, private hospitals are funded through private health insurance and patient fees and are not subject to the same public service mandates. Notably, many public hospitals deliver both public and private care via designated bed allocation and separate funding streams [9,10].

This structural divergence provides a compelling lens through which to examine the transferability of improvement methodologies such as LSS, particularly in relation to organisational culture, leadership behaviours, and staff engagement. With increasing international interest in embedding LSS in person-centred ways [3–8], this study aims to explore whether previously developed Programme Theories can support transferable learning for organisations seeking to align improvement work with the core values of compassion, dignity, and partnership, regardless of sectoral governance or funding model.

To ground the study, the following sections outline the origins and principles of Lean and Six Sigma, their integration as Lean Six Sigma (LSS), and the realist-informed approach used to develop the Programme Theories tested here.

2. Background

2.1. Lean

Lean originated in the Japanese automotive industry through the Toyota Production System (TPS) and was later popularised by Womack [11]. Its central aim is to improve

system performance by identifying and eliminating waste—activities that do not add value from the customer’s perspective [12]. In healthcare, waste is often expressed as Non-Value-Add (NVA) activity, such as duplication of documentation, discharge delays, and long patient waits [13,14]. By focusing on improving the flow of people, information, and materials, Lean has been widely applied in hospitals and primary care settings, where it has enhanced patient flow, reduced waiting times, and improved staff efficiency [6,7,15]. Importantly, Lean recognises both internal and external customers (e.g., clinicians and patients), aligning well with healthcare’s emphasis on the user experience [1,12,13].

2.2. Six Sigma

Six Sigma, developed by Motorola in the 1980s, is a data-driven methodology designed to reduce variation and errors through statistical analysis and structured problem solving [15]. In healthcare, it is most often deployed through the DMAIC (Define, Measure, Analyse, Improve, Control) cycle, which provides a cyclical framework for improvement [4,12,15]. A key strength is its attention to the ‘Voice of the Customer’, ensuring that improvement efforts address the needs of both patients and staff [6–8,15]. The application of Six Sigma has demonstrated benefits in patient safety, efficiency, and service quality [16–20], with staff engagement and data literacy emerging as critical enablers [15,16].

2.3. Lean Six Sigma (LSS)

Lean Six Sigma (LSS) integrates Lean’s waste reduction focus with Six Sigma’s statistical rigour [6,7]. Since the early 2000s, LSS has been increasingly adopted in healthcare and is now among the most commonly reported improvement methodologies [15]. Evidence highlights its impact on waiting times, diagnostic access, and theatre turnaround, as well as documentation and workflow standardisation [1,15,16,21,22]. While earlier work often treated LSS as a technical toolkit, more recent perspectives emphasise its potential to influence culture, collaboration, and systems thinking [5–7,23,24]. This wider view positions LSS not only as a set of tools but as an approach capable of shaping relational and ethical dimensions of improvement, aligning with person-centred cultures [5,7].

While Lean, Six Sigma, and LSS have demonstrated measurable improvements in efficiency and quality, their broader significance lies in how they intersect with the relational, ethical, and cultural dimensions of care. This creates a natural connection to the concept of person-centred cultures, which emphasise dignity, respect, and partnership as foundations for meaningful healthcare improvement [5–7].

2.4. Person-Centred Cultures

Person-centred care is widely recognised as a foundational pillar of quality healthcare and is defined by a commitment to dignity, respect, compassion, and partnership. It involves engaging individuals as active participants in their own care, tailoring interventions to their values, preferences, and needs. McCormack and McCance [25,26] conceptualise person-centredness through a framework that emphasises the importance of authentic relationships, supportive environments, and care processes that recognise and uphold personhood.

Person-centred cultures, then, are organisational contexts in which these principles are embedded in everyday practice. Such cultures are characterised by shared leadership, staff empowerment, collaborative decision-making, and a commitment to continuous learning and reflective practice [27]. When nurtured, person-centred cultures can positively influence outcomes for both patients and staff, supporting experiences of trust, safety, and holistic wellbeing.

Importantly, the emergence of person-centred cultures requires more than individual behavioural change; it demands systemic transformation, leadership support, and struc-

tural conditions that align improvement efforts with ethical care delivery. As Mannion and Davies [28] suggest, person-centredness must be seen as both a values-driven imperative and an organisational strategy. This view is echoed in health policy internationally, where person-centred care is now positioned as central to service delivery, quality, and accountability [1,3,6,7].

Recent scholarship has clarified that person-centredness is not a single intervention but rather a set of embedded practices sustained by a specific type of culture [29]. Person-centred cultures provide the necessary conditions for the reliable delivery of person-centred care [30], supporting not only the patient but also those involved in the broader care network, including families and staff [29–31]. These cultures require attentiveness to both the visible structures of care delivery and the often-invisible dynamics of communication, values alignment, and workplace relationships.

McCormack and Watson [32] caution that healthcare systems continue to overemphasise metrics, hard evidence, and tangible outputs, which may in fact hinder rather than enable person-centredness. Instead, McCormack [33] argues for an evaluative shift, one that situates measurable outcomes within a broader, person-oriented evaluation framework that values meaning, experience, and context.

In parallel with the rising prominence of person-centred care, healthcare organisations have increasingly adopted process improvement methodologies such as Lean Six Sigma (LSS). While LSS originated in manufacturing, it holds a core principle of delivering value as defined by the customer, aligning conceptually with the ethos of person-centredness [1,6–8]. However, despite the growing use of LSS and person-centred methodologies in parallel, relatively little is known about their relationship. This is particularly pressing given the argument that person-centred cultures are a prerequisite for the reliable delivery of person-centred care [29,30].

3. Study Rationale and Theoretical Foundation

3.1. Overview of Previous Realist Inquiry

This study builds on a previously published realist review and realist evaluation conducted in a large public acute hospital [5,7,8]. That realist inquiry explored how Lean Six Sigma (LSS), when taught and practised through a person-centred lens, contributed to the development of person-centred cultures in practice. It generated three final Programme Theories (PTs), each comprising context–mechanism–outcome configurations (CMOCs), which explained how LSS shaped staff engagement, relational practice, and improvement culture. CMOCs explain how particular outcomes arise when specific mechanisms are triggered within particular contexts [34]. In this framework, contexts refer to the structural, cultural, or organisational conditions; mechanisms are the reasoning or responses they trigger; and outcomes are the results of that interaction.

The PTs articulated the causal pathways through which LSS shaped organisational culture, staff identity, and improvement receptivity. Specifically:

- PT1: Organisational culture—how openness, leadership support, and communication facilitate cultural change through LSS.
- PT2: Receptivity to LSS—how structural support and perceived value influence staff engagement with LSS.
- PT3: Self-perception as practitioners—how internalised identity and peer networks support sustained LSS practice.

These theories are summarised in Table 1, which outlines the CMOCs associated with each Programme Theory developed in the original public hospital setting.

Table 1. Programme Theories and Associated Context, Mechanism, Outcome configurations from Public Hospital Setting (adapted with permission from Teeling et al. [7]).

Programme Theory	Context (C)	Mechanism (M)	Outcome (O)
PT1: Organisational Culture	C1: Absence of a Culture of ‘we’ve always done it this way’ C2: Absence of Improvement taking place only in departmental silos C5: Absence of scepticism to Process improvement C6: Communication is well organised and timely C7: Staff are open to new ways of working C8: There is an integrative and distributed approach to Lean Six Sigma deployment C9: Staff work in an organisation with competent Lean Six Sigma practitioners	M3: Management actively and visibly support and lead on improvement culture M4: The project charter is used to focus process improvement on both patients and staff M8: Recognition and use of support from the onsite service improvement team M9: Lean is promoted at the departmental level	O7: There is an explicit focus on staff experience in addition to that of patients O8: Increase in quality of care and improved patient outcomes O9: Culture change O10: LSS transcends silos
PT2: Receptivity to LSS	C3: Absence of an overreliance on measurement and outcomes C10: Improvement and change are seen as achievable C11: Resourced practice areas	M1: College (training) fees paid M2: LSS programme offered to all staff M5: Staff actively self-select and engage in programme M7: Staff given protected time to complete education in LSS M10: Provision of protected time to participate in wider LSS work	O3: Seen as an opportunity for professional development O6: Time released to spend with patient, adding value to practice O11: Collaborative, inclusive and participatory teams O12: LSS projects are a platform for further improvement
PT3: Self-Perception as Practitioners	C12: LSS practitioners are key people in leading process improvement projects C13: LSS practitioners are from within the organisation	M6: Staff are receptive to and are engaged by LSS practitioners M11: Peer Support M12: Dissemination of LSS results	O1: Increased job satisfaction O4: Staff feel actively engaged to lead on LSS O5: Staff feel valued and respected in the organisation O13: Staff become critical and creative LSS practitioners

3.2. Rationale for Theory Testing in a Private Sector Setting

Rather than replicating the realist review, this study focused on testing the transferability of the three original PTs developed in the Realist Evaluation [5,7,8] in a large private acute hospital. The primary objective was therefore to assess whether the previously developed PTs applied in a contrasting context. In realist evaluation, however, testing cannot be separated from the interlinked processes of refinement and learning. As PTs are explored, CMOCs may be confirmed, adapted, or extended, and new insights into contextual influences and mechanisms naturally emerge. These dimensions are thus not stand-alone aims but interconnected outcomes of the central task of testing PTs.

The private setting provides a contrasting organisational context, with less exposure to national improvement mandates and different incentives for staff engagement and leadership behaviours. As such, this study offers an opportunity to examine how sectoral context influences the mechanisms and outcomes associated with person-centred LSS.

A realist-informed evaluation approach was used, retaining the same core inclusion criteria and participant focus as the original public hospital study. Adjudication workshops, comparative documentary analysis, and structured dialogue were used to examine how the previously developed theories held or shifted in this new environment. To support contextual comparison, Table 2 outlines the characteristics of the original public hospital site and the current private hospital setting where programme theories were tested, including key variables such as organisational scale.

Table 2. Comparator of public and private study sites.

Feature	Original Study Site (Public)	Current Study Site (Private)
Type	Public acute Model 4 Teaching Hospital	Private Full-Service Acute Hospital
Location	Dublin, Ireland	Dublin, Ireland
Bed count	784 beds	181 beds
Staff employed	4300	1000
Patient volume	Serves 400,000 annually	Not publicly reported; full acute capacity
Lean Six Sigma (LSS) uptake	1600+ completed Fundamentals training in Lean Six Sigma; 214 Green/Black Belts.	500 completed Fundamentals training; 40 Green/Black Belts
Lean deployment	12 years	8 years
Programme delivery	UCD-accredited person-centred LSS education	UCD-accredited person-centred LSS education
Specialties include	Cardiology, Heart Lung Transplant, Trauma, spinal injury, neurology, emergency, oncology	Surgery, cardiology, diagnostics, orthopaedics, women's health
Governance and funding model	Publicly funded, HSE-operated	Privately funded, insurance- and fee-based

As outlined in Table 2, while both hospitals share core improvement structures and training pathways, the sectoral and organisational distinctions provide a valuable basis for testing the explanatory power of the original programme theories. The following section outlines the methods used to conduct this theory-testing evaluation.

4. Methods

4.1. Study Design

This study adopted a realist-informed evaluation design to test the transferability of three previously developed Programme Theories [7] in a private acute hospital setting. These theories, established through a realist review and empirical evaluation in a public teaching hospital, articulate how Lean Six Sigma (LSS) interacts with context to shape person-centred cultures. Rather than generating new theories, this evaluation examined whether the original context–mechanism–outcome configurations (CMOCs) were recognisable and constrained, or whether they required refinement in a healthcare setting with different governance, funding, and organisational dynamics. Realist methodology moves beyond the question of “does it work?” to examine for whom, in what circumstances, and why an intervention works [34]. Wong and colleagues [35] emphasise that testing programme theories across settings strengthens explanatory power, assesses external validity, and refines theoretical models in response to real-world variation.

This cumulative approach underpins realist-informed evaluations, where pre-developed theories are applied to new contexts to assess their robustness and relevance. This design has been used successfully in other healthcare studies. Flynn et al. [36] conducted a

multi-phase realist evaluation of Lean sustainability in four paediatric units, using previously developed PTs and CMOCs to test their applicability and to identify refinements in response to setting-specific dynamics. Their work demonstrated that theory-testing across organisational sites can illuminate which mechanisms are transferable and which are context-dependent. Other realist-informed evaluations in health systems have followed similar designs, where initial theories are tested through stakeholder engagement, documentary analysis, and structured adjudication to inform cross-contextual learning [37].

Following this approach, the current study applied the original three PTs, each comprising a set of CMOCs (Table 1) as the analytic framework for evaluation in the private hospital setting. The adjudication process enabled a structured examination of whether the original CMOCs were evident, adapted, or disrupted in the new context, and supported iterative refinement of the underlying theories based on empirical insights.

4.2. Setting and Participants

The evaluation was conducted in a private full-service acute hospital in Ireland, previously described in Table 2. Participants were selected using purposive sampling, aligned to the inclusion criteria used in the earlier public hospital study. Notably, all participants had completed the same university-accredited Lean Six Sigma (LSS) education and training programme as those in the original study [23]. This ensured consistency in the intervention under evaluation across both sites.

A pragmatic sample of 20 participants was drawn (50% of the total LSS-trained workforce at the site who met inclusion criteria, $n = 40$). These participants had completed the LSS programme since 2018 and remained employed within the hospital. Participants represented a wide range of disciplines, including Nursing, Medicine, Administration, Health and Social Care (Physiotherapy, Occupational Therapy, Dietetics), and Diagnostic and Support Services. This ensured diverse perspectives on programme theory adjudication.

4.2.1. Inclusion Criteria

- Completion of the university-accredited LSS education and training programme.
- Current employment within the private hospital study site.

4.2.2. Exclusion Criteria

- LSS programme graduates no longer employed at the study site.
- Graduates currently participating in other research projects, to avoid overburdening participants or influencing findings.

This purposive sample was selected to enable rich, theory-driven data generation on the study's Programme Theories. Participants were asked to reflect on how specific contexts (C) and mechanisms (M) interacted to produce or prevent particular outcomes (O) in their organisational setting. In keeping with realist methodology, they were invited to confirm, refute, or refine the original theories based on their lived experience of applying LSS in practice.

4.3. Data Collection

Data were collected through two structured, sequential programme theory adjudication workshops. These replicated the published approach developed and tested by the research team in a previous realist evaluation in a public hospital [7,38]. These workshops were purposefully designed to support person-centred and theory-driven data generation, in line with realist methodology and values-based inquiry [34,35].

Each participant attended two workshops of three hours each, held approximately one month apart to allow for data analysis between workshops one and two. The first

workshop focused on introducing and exploring the three original Programme Theories (PTs) and their associated context–mechanism–outcome configurations (CMOCs). The second workshop allowed both individual and group reflection on the PTs. It also supported collaborative refinement of the theories based on insights from Workshop 1. This iterative structure was deliberately chosen to allow participants time to reflect, deepen their analysis, and return with considered input grounded in their organisational reality. Participants attended two three-hour adjudication workshops, which replicated the facilitation protocol from our earlier realist evaluation [38]. This ensured methodological consistency and reproducibility, with the previous study demonstrating the robustness and replicability of the methods employed.

4.3.1. Rationale for Workshop Approach

This method was selected for its demonstrated ability to engage participants as co-constructors of knowledge, rather than passive research subjects [38]. Workshops were intentionally aligned to both realist theory adjudication and person-centred research principles, supporting dialogical engagement, relationship-building, and co-reflection [25]. As researchers trained in person-centred practice, the team deliberately adopted methods that enabled participants to express experience through a values-based lens. This approach attended to both technical and relational dimensions of improvement work [27,38]. Workshops have been shown to be effective in enabling the realist process of theory adjudication, particularly where participants are engaged in what Pawson and Tilley [34] describe as a “theory-testing role.” Rushmer et al. [39] note that workshops support a two-way exchange where knowledge, evidence, experience, and opinion are shared, interrogated, and deepened. In this study, the workshop design enabled participants to adjudicate CMOCs identified in the earlier realist review, and to refine or adapt these based on their organisational and experiential realities.

4.3.2. Workshop Design and Facilitation

Participants were drawn from a range of clinical, managerial, and support functions and were grouped interdisciplinarily in each session to reflect the collaborative ethos of Lean Six Sigma (LSS) implementation. This mirrored the team-based nature of most LSS improvement efforts and encouraged participants to share perspectives across functional boundaries. Each participant received a structured workbook containing all three PTs and their component CMOCs, along with open reflection prompts and visual mapping spaces (Figure 1). These workbooks served both as individual reflection tools and data collection artefacts, allowing participants to comment on theory relevance, propose refinements, and link abstract concepts to their own practice.



Figure 1. Sample of workbook from workshop 1.

To support participants in engaging meaningfully with the Programme Theories, the facilitation approach included an overview of the realist-informed study design and the nature of the PTs. Using the workbooks as visual and interactive guides, the facilitators explained the purpose of the workshop: to adjudicate the CMOCs derived from the original public hospital study through participants' own reflections and practical experience. This aligns with the teaching–learning dynamic in realist evaluation, where participants are positioned as active theory testers, not passive respondents [34].

The workbooks were revealed incrementally throughout the workshop to support both independent thinking and layered learning (Figure 1). Participants first generated their own CMOCs based on personal and professional experience. They were then introduced to the published PTs and CMOCs. This sequencing enabled any synergy, divergence, or newly emergent insights to be recorded and explored in dialogue. It supported the realist goal of identifying not only whether theories held, but under what conditions they applied, and what might be missing or misaligned in the new context [34].

Each workbook contained dedicated sections for participants to record observations on existing CMOCs, propose new ones, and reflect on the relevance of the PTs in their own settings. This structure ensured that participants' views, experiences, and beliefs about Lean Six Sigma and its effects on staff were foregrounded in the theory-testing process. In doing so, the design created space for both affirmation of existing configurations and the generation of novel contextual insights.

Workshops followed a published facilitation protocol developed by the research team for the public site realist evaluation [38].

- Workshop 1 introduced each Programme Theory in turn, inviting participants to explore whether the proposed CMOCs were active in the private hospital setting. Discussions were guided by reflective prompts such as:
 - “Have you experienced this combination of context and mechanism?”
 - “What helped or hindered this outcome from occurring here?”
 - “What might be missing or different in this context?”
- Between workshops, the research team synthesised participant responses, annotated workbook content, and emerging CMOC adaptations. These were collated into a thematic summary capturing individual insights and cross-cutting patterns. This summary was returned to participants in Workshop 2 as a printed handout. It enabled further reflection and structured adjudication.
- Workshop 2 revisited the PTs and CMOCs with this new synthesis in hand. Participants were invited to reflect again—individually and in groups, on whether the original CMOCs held, required refinement, or failed to resonate in their setting. This process allowed the team to revisit, confirm, refine, or refute original CMOCs and, where appropriate, generate new PTs that better reflected the private hospital context.

Creative engagement materials were used throughout. These included colour-coded CMOC cards, visual mapping templates, and themed concept illustrations. They promoted accessible and meaningful interaction with theoretical constructs. These materials, along with participants' annotated workbooks and PT diagram notes/markings, were collected and used as core data sources. At the end of each session, a brief debriefing activity used Evoke© cards, which combine imagery with emotive words. Participants used them to reflect on their experience and share insights or emotions in a non-verbal, values-driven manner. This activity was consistent with person-centred duty of care, recognising the emotional labour of reflective practice [38]. Participants were also provided with a summary of next steps, and invited to engage further should they have questions, concerns, or wishes to contribute additional reflection outside the group setting.

In line with realist evaluation, participants' role extended beyond sharing perspectives. They were explicitly positioned as theory adjudicators, tasked with confirming, refuting, or refining CMOCs and, where relevant, generating new contexts, mechanisms, outcomes, or programme theories. Their task was to interrogate whether the dynamics identified in the original public hospital study resonated within their own organisational context, and to highlight where adaptations were required. The research team's facilitation emphasised co-construction of knowledge, ensuring that participants were not passive respondents but active contributors to the refinement and development of theory. Outputs synthesised between Workshop 1 and Workshop 2 were returned to participants to enable further structured adjudication, thereby supporting both methodological transparency and reproducibility. This approach was consistent with the published facilitation protocol used in our earlier realist evaluation [38].

4.3.3. Researcher Positioning and Methodological Coherence

As a realist research team trained in both Lean Six Sigma and person-centred approaches, we viewed data generation as a relational and reflective act rather than a purely extractive one. Consistent with the public hospital study [38], our role was to facilitate collective meaning-making. We did not impose interpretive frames. We engaged participants as person-centred practitioners and encouraged evaluative dialogue that respected identity, expertise, and experience. This approach sought to integrate person-centred research values with realist methodological rigour, supporting the generation of trustworthy and contextually grounded findings [25,27]. Between workshop stages, the research team also engaged in structured reflective practice using Rolfe et al.'s [40] 'What? So what? Now what?' model. This supported iterative learning between sessions and ensured coherence between facilitation, analytical intent, and values-driven methodology.

4.3.4. Supplementary Data Sources

To support rigour and enable meaningful contextual interpretation, a structured documentary analysis was carried out alongside workshop-based data generation. The research team obtained site-level ethical approval to access existing qualitative and quantitative materials produced independently by staff engaged in LSS projects at the study site. These materials were generated as part of locally designed improvement initiatives, led by staff who had completed university-accredited education in Person-centred Lean Six Sigma [23].

The documentation reviewed included project charters, process maps, stakeholder engagement records, improvement reports, and reflective evaluation summaries. These artefacts were not created for this study. They emerged from authentic practice within the private hospital, where staff used LSS tools such as Gemba walks, stakeholder analysis, and the Voice of the Customer to inform project design and execution. As such, they provided valuable insight into the real-world application of the PTs being tested and helped illuminate the contextual conditions that supported or constrained the mechanisms under examination.

Documentary analysis allowed the research team to triangulate emerging workshop findings, validate contextual claims made by participants, and identify examples of mechanism activation or disruption. This approach aligned with person-centred and realist principles by privileging locally owned data and minimising duplication or researcher burden, while still enabling robust theory adjudication across multiple sources [5,23,38].

4.4. Data Analysis

Thematic analysis was used to support the adjudication and refinement of Programme Theories (PTs), drawing from multiple qualitative data sources generated across both workshops. In realist evaluation, the key analytic units are context–mechanism–outcome

configurations (CMOCs), which capture how and why a programme is theorised to work, for whom, and under what conditions [34,37].

Although realist methodology does not prescribe a specific analytic method, thematic analysis is recognised for its flexibility and has been successfully applied in previous realist evaluations involving interviews, focus groups, and workshops [41,42]. Its capacity to support both inductive and deductive coding makes it well suited to theory adjudication work, where data may confirm, modify, or challenge existing configurations [43,44].

In this study, Braun and Clarke’s [43] six-step approach to thematic analysis provided the framework for identifying, reviewing, and refining patterns within the data (Table 3).

Table 3. Braun and Clarke’s [43] Six Phases of Thematic Analysis.

Phase	Description
1. Familiarisation	Reading and re-reading data; noting initial ideas
2. Generating codes	Coding interesting features across the dataset
3. Searching for themes	Collating codes into potential themes; gathering data relevant to each
4. Reviewing themes	Checking themes against coded data and the full dataset
5. Defining and naming	Refining specifics of each theme; generating clear definitions
6. Producing the report	Final analysis, selection of compelling extracts, linking to research aims

This framework provided a transparent and structured approach and supported rigour in coding CMOC-related data across workshop artefacts, participant annotations, and field notes. Thematic patterns were then interpreted through a realist lens using retroductive reasoning. This linked participant insights to the original PTs and interrogated the causal logic underpinning outcomes [35].

To maintain clarity and rigour, a multi-stage analytic process was followed:

Analytic Process

1. **Initial Coding by CMOC**
Two researchers independently reviewed all primary data sources, workbooks, reflective outputs, and transcripts, and extracted segments relating to contexts (C), mechanisms (M), and outcomes (O). These were mapped against the relevant PTs using a coding template aligned with the original CMOC structure.
2. **Pattern Recognition and Thematic Mapping**
Using NVivo (version 15), codes were organised into parent and child nodes according to CMOC components. Cross-cutting patterns and thematic clusters were identified and reviewed across sources. This process enabled categorisation of participant input as confirming, refining, or extending specific CMOCs.
3. **Retroductive Adjudication and Refinement**
Analysis employed retroductive reasoning—an iterative interrogation of data and theory to understand the underlying generative mechanisms [35]. Each CMOC was examined to determine if it held in the private hospital context, required adaptation, or needed extension to reflect new contextual realities.
4. **Cross-Case Triangulation**
Data from both workshops, including annotated workbooks, audio dialogue, artefacts, and reflective materials, were triangulated to ensure credibility and robustness. This process identified recurring insights across interdisciplinary roles and organisational functions.
5. **Theory Synthesis and Reporting**
All CMOCs were categorised as confirmed, refined, or newly generated. These were then synthesised into a revised set of Programme Theories relevant to the private hospital context. Results are presented in Section 5.

This structured approach ensured that findings were not simply thematically organised, but that they contributed meaningfully to realist theory refinement. No CMOCs were refuted. All three Programme Theories held explanatory power in the private sector context; six CMOCs were refined, and eight new ones emerged from participant data.

5. Results

All three Programme Theories (Table 1) developed in the original public hospital setting were confirmed in the private hospital context. Across both adjudication workshops and supporting documentation, participants consistently recognised the explanatory value of the existing CMOCs, describing how they reflected the realities of Lean Six Sigma (LSS) implementation within their organisation. However, while no CMOCs were refuted, a number required refinement to better reflect sectoral differences, and several new CMOC elements were generated.

Following theory adjudication, 3 new Contexts, 5 new Mechanisms, and 1 new Outcome were identified across the Programme Theories, while 6 existing CMOCs were refined. These updates are summarised in Table 4, illustrating the theory evolution process within the private hospital setting.

Table 4. Revised Context–Mechanism–Outcome Configurations Following Realist Testing in the Private Hospital.

Programme Theory	Context	Mechanism	Outcome
PT1: Organisational Culture	C2 (refined): LSS projects occur at both departmental and system levels depending on need C15 (new): Strategic intent at senior level to commit to LSS deployment	M3, M4, M8, M9 (as per original) M13 (new): Shared Lean language supports cross-disciplinary understanding	O7–O10 (as per original) O14 (new): Improvement initiatives contribute to organisational efficiency
PT2: Receptivity to LSS	C3, C10–C11 (as per original)	M1, M2, M5, M7 (as per original) M10 (refined): Staff voluntarily engage in LSS even without protected time M17 (new): Staff commit personal time due to intrinsic motivation	O3, O6, O11–O12 (as per original)
PT3: Self-Perception as Practitioners	C12–C13 (as per original) C14 (new): Informal sense of community C16 (new): Presence of meaningful and relevant metrics	M6, M11–M12 (as per original) M14 (new): Communication skills enhanced through LSS training M15 (new): Informal community fosters sustained motivation M16 (new): LSS contributes to career development and identity	O1, O5, O13 (as per original) O4 (refined): Staff feel actively engaged to support and lead on LSS

Six existing CMOCs were refined. These included a reframing of Context 2 in PT1, where participants described improvement work occurring across both departmental and system levels depending on local needs, rather than simply overcoming silos. In PT2, Mechanism 10 was revised to reflect that even when protected time was not provided, staff still participated voluntarily, driven by internal motivation. This voluntary commitment also emerged as a distinct mechanism in its own right, later coded as M17. In PT3, Outcome 4 was refined from “staff feel engaged to lead” to “staff feel engaged to support and lead,” capturing more diverse modes of contribution. Further refinement occurred where participants described the informal community of LSS-trained staff not only as a context (C14), but also as a mechanism (M15) that activated ongoing engagement and identity. Finally, an additional outcome was identified under PT1: participants perceived LSS’s impact as contributing to organisational efficiency, expressed by them as improved quality of care, the removal of non-value-added steps in processes, enhanced experiences of care for both patients and staff, and the ability of the organisation to utilise its capacity more effectively to meet service demand, a refinement of the PT’s broader impact.

Alongside these refinements, several new CMOC elements were identified. These included the strategic intent of senior leadership to support LSS deployment (C15), the value of a shared Lean language in facilitating cultural change (M13), and the perception that LSS supported staff career development (M16). Other new elements reflected the private setting's emphasis on meaningful metrics (C16), improved communication skills developed through training (M14), and informal professional communities that sustained motivation (M15). These additions strengthened and extended the original programme theories, providing richer insight into how LSS was interpreted and sustained in this organisational context. The findings also illustrate how certain elements, such as informal peer networks, can act both as enabling contexts and as mechanisms, depending on how they influence participants' reasoning in practice. This underscores the flexible and layered nature of realist explanation, where analytic boundaries between context and mechanism can shift based on interpretive framing.

These findings confirm the overall transferability of the original theories while highlighting the specific contextual and cultural conditions through which person-centred Lean Six Sigma was activated in the private sector. The implications of these refinements and additions are explored in the following discussion.

6. Discussion

This realist-informed evaluation set out to test the transferability of three Programme Theories (PTs), initially developed in a public hospital setting. These related to: (1) organisational culture; (2) staff receptivity to Lean Six Sigma (LSS); and (3) self-perception as improvement practitioners. In the Irish context, public and private healthcare are often presented as dichotomous systems, differing in governance, access, funding structures, and organisational culture [45]. These perceived differences raise questions about whether improvement approaches developed in one sector can meaningfully translate to another. However, this study offers a more considered perspective.

All three PTs were confirmed in the private setting. Participants from across clinical, managerial, and support roles recognised the relevance of the original context–mechanism–outcome configurations (CMOCs), suggesting that the core principles of person-centred Lean Six Sigma (LSS) are not restricted by funding model or sector. This supports the realist proposition that well-developed theories, particularly those grounded in mechanisms linked to human behaviour, relationships, and organisational dynamics, can travel effectively when attention is paid to how they activate under different conditions [35,46].

At the same time, several refinements and additions were identified, highlighting how organisational context subtly shapes the expression of improvement work. The addition of strategic intent at senior level (C15) and organisational efficiency (O14) reflects a different improvement discourse. In the private hospital this was framed more around internal performance and competitive positioning than national policy alignment. These findings illustrate that while the mechanisms may be stable, the contexts in which they are triggered, and the outcomes valued, may shift across sectors [45].

The private setting illuminated several relational and professional dynamics that enriched the original theories. Participants described the emergence of an informal but cohesive improvement community (C14, M15). This operated as both a context and mechanism for sustaining engagement and reinforcing identity. The sense of peer connection, often arising outside formal structures, proved a powerful enabler of motivation and cultural change. Similarly, the identification of a shared Lean language (M13) as a mechanism underscores the value of accessible, unifying terminology in supporting cross-disciplinary collaboration and reinforcing organisational alignment.

A striking theme was the willingness of staff to engage voluntarily in improvement activities, even without protected time (M10 refined; M17 new). They consistently framed their involvement in LSS as an extension of professional identity and commitment to high-quality care. This resonates with previous work highlighting the role of internalised motivation and ownership in sustaining change beyond formal incentives [3,5,7,8,47]. The confidence participants expressed may reflect a more embedded improvement culture than originally anticipated.

Additional mechanisms, including enhanced communication skills developed through LSS training (M14) and a sense of career development and professional growth (M16), further suggest that person-centred improvement is experienced not only as a technical activity, but as a relational and developmental one. These mechanisms reinforce the growing literature on the importance of integrating human development goals within system transformation work [5,7,28,48].

These findings also contribute to the ongoing development of the Person-centred Lean Six Sigma (PCLSS) model. Initially generated through realist review and evaluation in a public hospital [7,38], the PCLSS model integrates Lean Six Sigma methodology with the values and principles of person-centred care, particularly those articulated by McCormack and McCance [25]. It offers a framework through which improvement is understood not only as process redesign, but as a relational, ethical, and cultural endeavour.

While this study focused primarily on staff-related mechanisms, participants also emphasised that the ultimate purpose of Lean Six Sigma implementation is to enhance patient outcomes. Improvements in referral processes, care coordination, and staff capacity were described as directly influencing patient experience and the timeliness and quality of care. We have therefore highlighted that patient benefit represents the underlying outcome of efficiency and culture-focused interventions, even when not explicitly the central analytic focus. Although the focus of mechanisms identified in this study enhanced staff motivation, shared improvement language, and informal improvement communities were primarily experienced at the staff level, their downstream significance lies in the benefits they facilitate for patients and families. The literature establishes a positive relationship between staff engagement and improved patient safety, with higher engagement correlating with fewer errors and a stronger safety culture [49]. Similarly, motivated healthcare workers have been linked to better quality improvement efforts and patient safety across diverse settings [50] while staff motivation has also been shown to significantly influence patient satisfaction [51,52]. By making these connections explicit, this study underscores that person-centred Lean Six Sigma is not only about fostering staff empowerment but is also instrumental in delivering meaningful, patient-centred value through more reliable, efficient, and compassionate care.

This study extends the model's application into the private sector, providing empirical insight into how its core assumptions hold, and how they adapt, in different organisational logics. It affirms that the model's emphasis on leadership, communication, team-based working, and inclusive metrics resonates across healthcare contexts. Our findings highlight the importance of senior leadership's strategic intent (C15) and the emergence of informal improvement communities (C14, M15) in the private setting, suggesting that a deeper analysis of these dynamics would be highly valuable. In addition, wider contextual influences such as leadership styles, external implementation support, and broader political and policy environments may also shape how Programme Theories are activated in practice. Future research should therefore explore these dynamics further, as they are likely to impact not only the emergence of person-centred improvement cultures but also the sustainability and scalability of person-centred Lean Six Sigma across health systems. Moreover, new ele-

ments identified here, particularly around peer networks, shared language, and practitioner identity, enhance the model's explanatory depth and transferability.

Limitations and Generalisability

While the findings of this study provide transferable insights into the contextual and cultural dimensions of Lean Six Sigma (LSS) implementation, particularly in relation to staff engagement and person-centred cultures, some limitations must be acknowledged. The study was conducted in a single private acute hospital in Ireland, using pre-developed Programme Theories (PTs) derived from earlier work in a public hospital setting [7,38]. Although the original CMOCs were strongly recognised and upheld, the extent to which these findings apply across other private healthcare settings, or in health systems with different governance or funding structures, remains to be tested.

This limitation is partially mitigated by the wider programme of research from which this study draws. The PTs tested here were developed through a realist review and realist evaluation within the Irish public sector and have since informed the development of the Person-centred Lean Six Sigma (PCLSS) model [5,7,8,24]. Although the model itself is not the focus of this paper, it provides a broader conceptual backdrop and reflects a synthesis of relational and technical principles rooted in the same realist logic. The PCLSS model is currently in use by individuals and teams across 12 countries, and has been translated into German and Spanish, supporting international adaptation and use in varied care settings [5,8,24].

While the number of sites in this study was necessarily limited, realist evaluation places less emphasis on the volume of cases and more on achieving theory saturation, that is, gathering sufficient evidence to robustly test, confirm, refute, or refine programme theories [6,46,53]. Nonetheless, further independent studies across diverse contexts would be valuable to expand the transferability of these findings.

We acknowledge the concentration of literature cited by the authors and their collaborators. However, this clearly reflects both the current stage of research in this specific field and the fact that, to date, there are few published studies explicitly exploring the intersection between Lean Six Sigma and person-centred culture in healthcare. Rather than a limitation of scope, this highlights the contribution of a sustained and cumulative research programme [3,5–7,9]. Nonetheless, future research from independent teams, using alternative methodologies or applied in different international settings, will be helpful in testing the robustness and relevance of these Programme Theories further. The availability of the original realist review and realist evaluation in peer-reviewed journals [7], alongside a specific methods paper [38], and now this comparative study, provides a coherent and transparent body of work from which others can generate and test Programme Theories relevant to the intersection of person-centred care and Lean Six Sigma. This cumulative scholarship provides a foundation for iterative refinement and contextual adaptation [53] of emerging theories, supporting further exploration of how the relational and technical dimensions of improvement can be effectively integrated in diverse health system settings. Although the findings are rooted in the Irish context, the mechanisms identified here—such as intrinsic motivation, shared language, and informal improvement communities—reflect challenges and dynamics common to health systems worldwide. Recent reviews of Lean Six Sigma in healthcare noted that operational complexity, varied funding models, and readiness factors including leadership commitment, training, and cultural alignment were consistently reported internationally [54,55]. From a realist perspective, this highlights the potential transferability of Programme Theories: while high-level generative mechanisms may resonate across countries, their activation and outcomes will inevitably be shaped by governance and funding structures. Framing the findings in this way strengthens

their relevance for international audiences while maintaining sensitivity to contextual specificity. This is consistent with the principles of realist evaluation, which emphasise testing Programme Theories across multiple contexts to examine how, why, and for whom interventions work. Realist evaluation does not seek to produce fixed generalisations but instead develops flexible, transferable theories by identifying the generative mechanisms that hold across different settings [53].

7. Conclusions

This study provides evidence that, despite structural and funding differences between public and private hospitals, core mechanisms supporting person-centred improvement may still be applicable. The desire among staff to engage in relational, values-based improvement was evident across all disciplines and functions. This reinforces the potential for cross-sector learning in healthcare improvement and the enduring relevance of context-sensitive, yet transferable, theories of change.

We set out to explore whether three previously developed Programme Theories, originally generated through realist inquiry in a large public hospital, could be transferred, refined, or extended when applied in a contrasting private hospital context. All three PTs were confirmed as relevant and explanatory in the private setting, demonstrating that the underlying mechanisms linking LSS to person-centred cultural development are not confined to the public sector. Importantly, this finding challenges assumptions that structural or funding differences between public and private healthcare systems necessarily limit the relevance of values-based improvement methodologies.

While the theories held, the adjudication process also identified meaningful refinements and additions. These included the emergence of new contextual enablers, such as senior-level strategic commitment to LSS, and new mechanisms including informal communities of practice, intrinsic motivation to improve care, and enhanced communication and career development skills gained through LSS education. These findings illuminate the nuanced ways in which organisational setting shapes the manifestation, but not the underlying validity of person-centred improvement mechanisms.

The consistency of core mechanisms across sectors, combined with context-specific refinements, reinforces the explanatory power and adaptability of the original PTs. This supports a broader conclusion: that improvement methodologies such as LSS, when taught and practised through a person-centred lens, can transcend organisational boundaries and foster meaningful cultural change. The desire among healthcare staff to work in values-driven, relationally focused environments appears to be a shared aspiration, regardless of setting.

While this study did not set out to evaluate the Person-centred Lean Six Sigma (PCLSS) model itself, it contributes to its broader conceptual foundation by testing and refining the Programme Theories upon which the model was later built. These PTs remain analytically distinct from the model and were tested independently through realist-informed evaluation. The findings lend empirical support to the argument that improvement work is most effective and sustainable when it engages both the technical and relational dimensions of practice.

Our research network will continue to test these theories in different countries, organisational types, and resource contexts, and examine how implementation support, leadership, and policy environments shape their activation. Dedicated economic evaluation and longer-term studies may also help to assess the return on investment of person-centred LSS in different systems. Such evaluations could move beyond operational efficiency to quantify wider economic and organisational value, including impacts on patient outcomes, staff wellbeing, and system-level sustainability. Lean Six Sigma implementations have

already demonstrated these kinds of benefits in healthcare, with improvements noted in both operational and financial performance, indicating the potential to measure return on investment beyond mere process metrics [55]. While this study primarily focused on staff-related PTs, it is important to acknowledge that such improvements ultimately serve patients. Enhancements in coordination, leadership engagement, and the more effective use of organisational capacity are all directed towards supporting better patient experiences and outcomes. Although patient-level measures were not directly assessed here, the person-centred orientation of Lean Six Sigma ensures that patients remain the ultimate beneficiaries of system and cultural improvements [1,5,7,8].

Given the growing use of Lean Six Sigma as an improvement methodology [3], alongside the increasing emphasis on person-centred approaches to healthcare improvement [5], there exist opportunities for other researchers to test these theories in different contexts further. Future independent studies conducted across different health systems, organisational types, and governance structures would provide additional opportunities to test the robustness and applicability of these PTs in diverse settings. Realist Evaluation has also been applied beyond healthcare, including in education, where it supported the development of middle-range theories in faculty development programmes [56], in performance management [57], where it illuminated mechanisms of accountability and improvement and in policy implementation research linked to budgeting and resource allocation [58] demonstrating its versatility for evaluating other management methodologies. While realist methodology is particularly suited to addressing questions of ‘what works, for whom, and in what circumstances,’ future studies employing other approaches such as ethnography, comparative case study, or quantitative evaluation may provide complementary perspectives and strengthen understanding of the robustness and wider relevance of the PTs.

However, this study offers strong evidence that the foundational principles of person-centred improvement are both portable and powerful. When appropriately supported, staff across sectors are not only capable of leading change, but they are also motivated to do so in ways that uphold dignity, foster collaboration, and promote a shared purpose.

Author Contributions: S.P.T., D.B. and A.D.; Conceptualization and methodology: S.P.T., D.B. and A.D.; formal analysis: S.P.T., D.B. and A.D.; investigation: A.D.; resources: A.D., A.P., N.W., G.F. and C.G.; data curation: S.P.T., A.D. and N.W.; writing—original draft preparation: S.P.T., D.B. and A.D.; writing—review and editing: S.P.T., D.B., A.D., A.P., N.W., G.F. and C.G.; visualisation: S.P.T.; supervision: S.P.T. and D.B.; project administration: A.D. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no funding.

Institutional Review Board Statement: This study’s received ethical approval by the IRB of the Beacon Hospital on 18 January 2023, protocol code BEA0200 Lean Study.

Informed Consent Statement: Participants gave informed consent.

Data Availability Statement: Developed programme theory and CMOC are presented in the paper.

Acknowledgments: The authors acknowledge and thank all research participants in this study.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. MacGillivray, T.E. Advancing the culture of patient safety and quality improvement. *Methodist DeBakey Cardiovasc. J.* **2020**, *16*, 192–198. [[CrossRef](#)]
2. Wackerbarth, S.B.; Bishop, S.S.; Aroh, A.C. Lean in healthcare: Time for evolution or revolution? *J. Healthc. Qual.* **2021**, *43*, 32–38. [[CrossRef](#)]

3. Rath, R.; Vakharia, A.; Shadab, M. Lean Six Sigma in the Healthcare Sector: A Systematic Literature Review. *Mater. Today Proc.* **2022**, *50*, 773–781. [CrossRef]
4. Vaishnavi, V.; Suresh, M. Modelling of readiness factors for the implementation of Lean Six Sigma in healthcare organisations. *Int. J. Lean Six Sigma* **2020**, *11*, 597–633. [CrossRef]
5. Teeling, S.P.; Baldie, D.; Daly, A.; Keown, A.M.; Igoe, A.; Dowling, C.; McNamara, M. The contribution of a person-centred model of Lean Six Sigma to the development of a healthful culture of health systems improvement. *Front. Health Serv.* **2025**, *5*, 1621233. [CrossRef]
6. Teeling, S.P.; Dewing, J.; Baldie, D. A discussion of the synergy and divergence between Lean Six Sigma and person-centred improvement sciences. *Int. J. Res. Nurs.* **2020**, *11*, 10–23. [CrossRef]
7. Teeling, S.P.; Dewing, J.; Baldie, D. A realist inquiry to identify the contribution of Lean Six Sigma to person-centred care and cultures. *Int. J. Environ. Res. Public Health* **2021**, *18*, 10427. [CrossRef] [PubMed]
8. Teeling, S.P. *The Person-Centred Lean Six Sigma Model: A Guide for Health Service Staff Seeking to Adopt a Person-Centred Approach to Lean Six Sigma Quality and Process Improvement Interventions*; University College Dublin: Dublin, Ireland, 2023. Available online: <https://www.ucd.ie/nmhs/t4media/English%20-%20spreads%20for%20web.pdf> (accessed on 24 June 2025).
9. Citizens Information Board. *Hospital Services Introduction*; Citizens Information Board: Dublin, Ireland, 2023. Available online: <https://www.citizensinformation.ie/en/health/health-services/gp-and-hospital-services/hospital-services-introduction/> (accessed on 24 June 2025).
10. Health Service Executive. *Patient and Service User Partnership Proposal for the Design of Health Regions*; HSE: Dublin, Ireland, 2024. Available online: <https://www.hse.ie/eng/about/who/acute-hospitals-division/> (accessed on 15 April 2025).
11. Womack, J. *Gemba Walks*, 2nd ed.; Lean Enterprise Institute: Boston, MA, USA, 2013.
12. Kim, C.S.; Spahlinger, D.A.; Kin, J.M.; Billi, J.E. Lean health care: What can hospitals learn from a world-class automaker? *J. Hosp. Med.* **2006**, *1*, 191–199. [CrossRef]
13. Aherne, J.; Whelton, J. *Applying Lean in Healthcare: A Collection of International Case Studies*; Productivity Press: New York, NY, USA, 2010.
14. Zidel, T.G. *A Lean Guide to Transforming Healthcare: How to Implement Lean Principles in Hospitals, Medical Offices, Clinics and Other Healthcare Organisations*; Quality Press: Milwaukee, WI, USA, 2006.
15. Antony, J.; Sunder, M.; Sreedharan, R.; Chakraborty, A.; Gunasekaran, A. A systematic review of Lean in healthcare: A global prospective. *Int. J. Qual. Reliab. Manag.* **2019**, *36*, 1370–1391. [CrossRef]
16. Kaplan, G.S.; Patterson, S.H.; Ching, J.M.; Blackmore, C.C. Why Lean doesn't work for everyone. *BMJ Qual. Saf.* **2014**, *23*, 970–973. [CrossRef]
17. Daly, A.; Teeling, S.P.; Garvey, S.; Ward, M.; McNamara, M. Using a combined Lean and person-centred approach to support the resumption of routine hospital activity following the first wave of COVID-19. *Int. J. Environ. Res. Public Health* **2022**, *19*, 2754. [CrossRef] [PubMed]
18. Kunnen, Y.S.; van de Wetering, R.; Koning, H. What are barriers and facilitators in sustaining Lean management in healthcare? A scoping review. *BMC Health Serv. Res.* **2023**, *23*, 678. [CrossRef]
19. Mason, S.E.; Nicolay, C.R.; Darzi, A. The use of Lean and Six Sigma methodologies in surgery: A systematic review. *Surgeon* **2015**, *13*, 91–100. [CrossRef]
20. Williams, S.; Radnor, Z. An integrative approach to improving patient care pathways. *Int. J. Health Care Qual. Assur.* **2018**, *31*, 810–821. [CrossRef]
21. Sohal, A.; De Vass, T.; Vasquez, T.; Bamber, G.J.; Bartram, T.; Stanton, P. Success factors for Lean Six Sigma projects in healthcare. *J. Manag. Control* **2022**, *33*, 215–240. [CrossRef]
22. Williams, S. Lean and Person-Centred Care: Are They at Odds. In 'Proceedings of the 26th Annual Conference of the Production and Operations Management Society (POMS)'; Production and Operations Management Society: Washington, DC, USA, 2015. Available online: <http://www.pomsmeetings.org> (accessed on 27 November 2022).
23. McNamara, M.; Teeling, S.P. Developing a university-accredited Lean Six Sigma curriculum to overcome system blindness. *Int. J. Qual. Health Care* **2019**, *31* (Suppl. S1), 3–5. [CrossRef]
24. Teeling, S.P.; Keown, A.; Cunningham, Ú.; Keegan, D. The application of a person-centred approach to process improvement in ophthalmology services in the North East of the Republic of Ireland. *Int. Pract. Dev. J.* **2023**, *13*, 1–18. [CrossRef]
25. McCormack, B.; McCance, T. *Person-Centred Practice in Nursing and Health Care: Theory and Practice*, 2nd ed.; John Wiley & Sons: Newark, NJ, USA, 2016.
26. McCormack, B.; McCance, T. The person-centred nursing framework. In *Person-Centred Nursing Research: Methodology, Methods and Outcomes*; Dewing, J., McCormack, B., McCance, T., Eds.; Springer: New York, NY, USA, 2021; pp. 13–28.
27. Dewing, J.; McCormack, B.; Titchen, A. *Practice Development for Nursing, Health and Social Care Teams*; John Wiley & Sons: Chichester, UK, 2015.

28. Mannion, R.; Davies, H.T.O. Understanding organisational culture for healthcare quality improvement. *BMJ* **2018**, *363*, k4907. [\[CrossRef\]](#)
29. Hardiman, M.; Dewing, J. Using two models of workplace facilitation to create conditions for the development of a person-centred culture: A participatory action research study. *J. Clin. Nurs.* **2019**, *28*, 2769–2781. [\[CrossRef\]](#) [\[PubMed\]](#)
30. McCance, T.; McCormack, B. Developing healthful cultures through the development of person-centred practice. *Int. J. Orthop. Trauma Nurs.* **2023**, *51*, 101055. [\[CrossRef\]](#) [\[PubMed\]](#)
31. McCormack, B.; Dewing, J. International Community of Practice for Person-centred Practice: Position statement on person-centredness in health and social care. *Int. Pract. Dev. J.* **2019**, *9*, 1–7. [\[CrossRef\]](#)
32. McCormack, B.; Watson, R. Values, virtues and initiatives—Time for a conversation. *J. Adv. Nurs.* **2018**, *74*, 753–754. [\[CrossRef\]](#) [\[PubMed\]](#)
33. McCormack, B. Person and Family Centredness—The Need for Clarity of Focus. *Eur. Burn J.* **2024**, *5*, 166–168. [\[CrossRef\]](#)
34. Pawson, R.; Tilley, N. *Realistic Evaluation*; Sage: London, UK, 1997.
35. Wong, G.; Westhorp, G.; Manzano, A.; Greenhalgh, J.; Jagosh, J.; Greenhalgh, T. RAMESES II reporting standards for realist evaluations. *BMC Med.* **2016**, *14*, 96. [\[CrossRef\]](#) [\[PubMed\]](#)
36. Flynn, R.; Newton, A.S.; Rotter, T.; Hartfield, D.; Walton, S.; Fiander, M.; Scott, S.D. The sustainability of Lean in paediatric healthcare: A realist review. *Syst. Rev.* **2018**, *7*, 137. [\[CrossRef\]](#)
37. Dalkin, S.M.; Greenhalgh, J.; Jones, D.; Cunningham, B.; Lhussier, M. What’s in a mechanism? Development of a key concept in realist evaluation. *Implement. Sci.* **2015**, *10*, 49. [\[CrossRef\]](#)
38. Teeling, S.P.; Dewing, J.; Baldie, D. Developing new methods for person-centred approaches to adjudicate context–mechanism–outcome configurations in realist evaluation. *Int. J. Environ. Res. Public Health* **2022**, *19*, 2370. [\[CrossRef\]](#) [\[PubMed\]](#)
39. Rushmer, R.K.; Hunter, D.J.; Steven, A. Using interactive workshops to prompt knowledge exchange: A realist evaluation of a knowledge-to-action initiative. *Public Health* **2014**, *128*, 552–560. [\[CrossRef\]](#)
40. Rolfe, G.; Freshwater, D.; Jasper, M. *Critical Reflection for Nursing and the Helping Professions: A User’s Guide*; Palgrave: Basingstoke, UK, 2001.
41. Westhorp, G. *Realist Impact Evaluation: An Introduction*; Overseas Development Institute: London, UK, 2014.
42. Mazzocato, P.; Savage, C.; Brommels, M.; Aronsson, H.; Thor, J. Lean thinking in healthcare: A realist review of the literature. *Qual. Saf. Health Care* **2010**, *19*, 376–382. [\[CrossRef\]](#)
43. Braun, V.; Clarke, V. Using thematic analysis in psychology. *Qual. Res. Psychol.* **2006**, *3*, 77–101. [\[CrossRef\]](#)
44. Boyatzis, R.E. *Transforming Qualitative Information: Thematic Analysis and Code Development*; Sage Publications: London, UK, 1998.
45. Burke, S.; Barry, S.; Siersbæk, R.; Johnston, B.; Ní Fhallúin, M. Sláintecare—A ten year plan to achieve universal healthcare in Ireland. *Health Policy* **2018**, *122*, 1278–1282. [\[CrossRef\]](#)
46. Pawson, R. *The Science of Evaluation: A Realist Manifesto*; Sage: London, UK, 2013.
47. Dixon-Woods, M.; McNicol, S.; Martin, G. Ten challenges in improving quality in healthcare: Lessons from the Health Foundation’s programme evaluations and relevant literature. *BMJ Qual. Saf.* **2012**, *21*, 876–887. [\[CrossRef\]](#) [\[PubMed\]](#)
48. Knapp, S. Lean Six Sigma implementation and organizational culture. *Int. J. Health Care Qual. Assur.* **2015**, *28*, 855–863. [\[CrossRef\]](#) [\[PubMed\]](#)
49. Schwendimann, R.; Zimmermann, N.; Küng, K.; Ausserhofer, D.; Sexton, B. Variation in Safety Culture Dimensions Within and Between US and Swiss Hospital Units: An Exploratory Study. *BMJ Qual. Saf.* **2013**, *22*, 32–41. [\[CrossRef\]](#) [\[PubMed\]](#)
50. Mutale, W.; Ayles, H.; Bond, V.; Mwanamwenge, M.T.; Balabanova, D. Measuring Health Workers’ Motivation in Rural Health Facilities: Baseline Results from Three Study Districts in Zambia. *Hum. Resour. Health* **2013**, *11*, 8. [\[CrossRef\]](#) [\[PubMed\]](#)
51. Aly, H.A.E.; Abed, F.A.; Mohamed, M.Z. Relationship Between Staff Nurse Motivation Level and Patient Satisfaction in Selected Hospital. *Egypt. Nurs. J.* **2023**, *20*, 131–137. [\[CrossRef\]](#)
52. Yilmaz, F.K.; Karakuş, S. The Relationship Between Healthcare Workers’ Satisfaction Level and Patients’ Satisfaction: Results of a Path Analysis Model. *J. Healthc. Qual. Res.* **2023**, *38*, 338–345. [\[CrossRef\]](#)
53. Jagosh, J. Realist synthesis for public health: Building an ontologically deep understanding of how programs work, for whom, and in which contexts. *Annu. Rev. Public Health* **2019**, *40*, 361–372. [\[CrossRef\]](#)
54. Rosa, A.; Marolla, G.; Lega, F. Lean adoption in hospitals: The role of contextual factors and introduction strategy. *BMC Health Serv. Res.* **2021**, *21*, 889. [\[CrossRef\]](#)
55. McDermott, O.; Antony, J.; Bhat, S.; Jayaraman, R.; Rosa, A.; Marolla, G.; Parida, R. Lean Six Sigma in Healthcare: A Systematic Literature Review on Motivations and Benefits. *Processes* **2022**, *10*, 1910. [\[CrossRef\]](#)
56. Haruta, J.; Goto, M.; Yoshida, K.; Yoshimoto, H.; Ichikawa, S.; Matsumura, T. Realist Approach to Medical Education Research: Evaluation of a Faculty Development Programme for Family Medicine Clinical Teachers. *Med. Teach.* **2019**, *41*, 1405–1411. [\[CrossRef\]](#)

57. Tan, H.T. Realist Evaluation of Performance Management in Voluntary Organisations: How and Why Does It Work? *Public Manag. Rev.* **2016**, *18*, 243–266. [[CrossRef](#)]
58. Dossou, J.P.; De Brouwere, V.; Van Belle, S. Opening the ‘Implementation Black-Box’: Realist Evaluation of Policy Implementation in Maternal Health in Benin. *Front. Public Health* **2021**, *9*, 553980. [[CrossRef](#)]

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.