Time pressure and teamwork: a quest for quality improvement in hospitals

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Illustration 2. The Path

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General Introduction

In 2005, Elaine Bromiley, attended hospital for an elective routine nasal operating procedure. She was an otherwise fit and well 37 years old, mother-of-two. On the day of the procedure, after applying monitoring and carrying out routine checks, anaesthesia was induced. Soon after, attempts at securing the airway were very difficult. Oxygen saturation dropped to 40% and her heart rate started to drop, too. Several attempts at intubation by two different consultant anaesthetists all failed. The team was now faced with a 'Cant' Intubate, Can't Oxygenate' scenario. Suggestions by theatre nurses to perform an emergency front of neck airway and admit the patient to the intensive care unit were not acknowledged. Forty minutes later, it was agreed to abandon the procedure and to wake Elaine up. Unfortunately, Elaine never regained appropriate consciousness. She sadly passed away 13 days later.

In hindsight it was recognised that the anaesthetists had acted in tunnel vision and lost track of time. The nurses, seeing what was needed, did not speak out loud to break the tunnel vision.

The report 'To Err is Human' (Kohn et al., 2000, p. p 881) highlighted the alarming prevalence of preventable harm in American hospitals, attributing a significant portion to human fallibility. Specifically, poor collaboration and coordination of care were identified as common causes of preventable harm. Research (Ghaferi et al., 2009) suggests that in reducing preventable mortality, the ability to "rescue" during incidents is more crucial than merely preventing errors and incidents. Effective teamwork is essential for timely intervention and mitigation. Consequently, many hospitals have initiated safety improvement programmes, with teamwork as a central focus. One such approach, developed by the U.S. Agency for Healthcare Research and Quality, is TeamSTEPPS™ (King et al., 2008; Sawyer et al., 2013).

In the Netherlands, NIVEL conducted a similar study on preventable harm (Langelaan, 2010) as in the USA. The Dutch government initiated the development of the 'Safety Management System' for hospitals. The method was inspired by safety approaches in the oil industry and obligatory implemented from 2008 to 2012 in Dutch hospitals. Around the same time, many Dutch hospitals adopted Crew Resource Management (CRM), a method derived from aviation safety practices, also focusing heavily on teamwork like the TeamSTEPPS™ approach.

Implementing and scaling these initiatives often proved challenging in all countries, giving rise to quality improvement (QI) and implementation science as distinct academic disciplines. Methods within these disciplines are largely rooted in evidence-based practice and the Plan-Do-Check-Act (PDCA) cycle (Taylor et al., 2014), aligning with a positivist paradigm that emphasises demonstrable improvement and control.

However, scholars have noted the persistent absence of large-scale, sustained behavioural change and improvement in patient safety within hospitals (Sujan, 2018; Vogus & Hilligoss, 2016). They plead for a new paradigm to advance the field. Emerging approaches, such as Safety II, mindful organising, and resilience engineering, view organisations as complex adaptive systems. These approaches are complemented by theories on cultural change and habit formation, which propose that organisational cultures and habitual practices are more enduring than individual project outcomes. Moreover, there is growing attention to the well-being of healthcare professionals alongside patient safety and patient participation, particularly against the backdrop of rising burnout rates (DeCaporale-Ryan et al., 2017) and worsening staff shortages.

RESEARCH QUESTIONS AND OBJECTIVES

Healthcare professionals often cite time pressure as a key reason for not participating in quality improvement initiatives or for allowing such efforts to lapse. From their perspective, quality improvement (QI) is just one of many non-patient-related tasks that detract from their primary responsibility: patient care. This dissertation aims to explore and understand the relationship between time pressure and quality improvement (Part 1) and to subsequently facilitate practical changes (Part 2).

This has led to two primary research questions, corresponding to the two parts of the dissertation:

1. What is time pressure, and how does it relate to quality improvement within a team?
2. How can teams contribute to ongoing quality improvement with less time investment and without experiencing time pressure?

In this study, we frequently refer to the term “quality of care” which includes patient safety. Our scope is limited to the circle of influence of hospital-based care teams consisting of doctors, nurses, and patients. Broader organisational or national prerequisites, and issues such as waiting lists are beyond the study's remit.

RESEARCH SETTING

The first part of the research was conducted in the operating theatres (OTs) of a single specialty predominantly performing elective surgeries, while the second part took place in a paediatric ward, which naturally involves a high proportion of acute care. These two distinct contexts were not premeditated but provided a unique opportunity for two reasons.

Firstly, it was interesting to investigate time pressure within a surgical team focused on elective care, as existing studies often address time pressure in acute settings. Secondly, the decision to study time pressure and teamwork within a ward context was informed by findings from the 'Monitor for Healthcare Related Harm' (Schoten, 2022)), which indicated that only about 35% of preventable harm and mortality occurs during surgical procedures. The remainder arises during other interventions, such as medication administration, diagnostics, nursing, or paramedical care. Although not all categories are location-specific, it is evident that organisational and human errors—frequent factors in preventable harm—extend beyond acute and intervention-based departments. Despite this, most studies focus on operating theatres, delivery rooms, ICUs, and emergency departments.

Teamwork in a ward setting poses unique challenges due to the lack of natural team consultation moments, unlike in operating theatres. Moreover, patients often play a more active role in wards. By conducting research in both settings, we created the opportunity to identify whether the differences in context were relevant.

There was also a pragmatic reason to choose for these two departments. Both departments expressed a desire to conduct an research project or improvement initiative aimed at enhancing team situational awareness[1] (SA) (Kaber & Endsley, 2004). Team SA is a core concept in the safety approaches of Safety II and mindful organising, as it is a prerequisite for responding effectively to the needs of the moment. This includes preventing incidents from escalating into harm or even fatalities, as in the case of Elaine Bromiley. Naturally, achieving team SA requires effective teamwork, including the sharing of all relevant information to develop a shared understanding of the situation.

THEORY

Our theoretical framework considers hospital organisations as complex adaptive systems (Homan, 2023; Stacey, 2001). Adaptability and resilience—or transformative capacity—are vital for responding to situational demands and recovering from setbacks. These adjustments do not occur through central control but rather through numerous initiatives and interactions within the system's fabric. Effective adaptation requires sufficient interactions of adequate quality among the various actors within the system. Complexity theory describes transformation but does not provide an actionable perspective for achieving transformation and change. For that, we draw on theory on transformative learning (Mezirow, 1997; Myren et al., 2022).

1 SA is the process of perceiving and interpreting the situation at hand and anticipating at what comes next.

Drawing on Safety II theory (Hollnagel, 2014), we view quality and safety as the active presence of behaviours, thinking patterns, measures, and conditions that support effective care delivery and not merely as the absence of errors, that can only be identified in hindsight. This perspective entails continuous learning and inherently involves patient participation, as they are integral part of the team and the system (Hollnagel et al., 2019; Koksma & Kremer, 2019). Hollnagel and Braithwaite (2019, p. 213) advocate for frequent reflection and learning from the variability in everyday practice that typically results in good care, in contrast to the widely adopted approach of learning from rare errors, conducting root cause analyses, and implementing best practices proposed by external sources. This perspective emphasises regular (daily) learning and understanding how teams consistently succeed in providing high-quality care.

We use the term 'mindful routines' (Vogus & Hilligoss, 2016) to describe the desired habitual thinking and actions in teams, based on the principles of mindful organising theory. In this context mindfulness refers to a heightened awareness and openness that facilitates the integration of information among team members, to achieve shared situational awareness (SA) and context-appropriate actions. Routines play a key role in embedding mindfulness and SA structurally and sustainably within the team's operations. For instance, a mindful routine could involve team briefings where members share information, seek feedback, and perform standardised checks to identify subtle yet relevant deviations.

METHODOLOGY

The ontological (nature of reality) and epistemological (ways of knowing reality) foundations of this dissertation are rooted in social constructivism, as articulated by Piaget and Berger & Luckmann (Berger & Luckmann, 1967; Pass, 2004; Von Glasersfeld, 1982). This perspective posits that reality is co-constructed through interaction with others and shaped by societal and cultural values, or what I term the "spirit of the times." Reality is thus historically situated and not objectively knowable.

However, it is possible to explore different conceptions of reality. By juxtaposing multiple perspectives, one's initial viewpoint is relativized and enriched, and by engaging with others, collective knowledge can emerge. Our epistemology also incorporates an ethical dimension, inspired by Fricker and Abma (Abma, 2020; Abma & Widdershoven, 2014; Fricker, 2007) we strive for epistemic justice, meaning that different forms of knowledge—experiential, scientific, professional, and embodied—each have intrinsic value and merit inclusion in research. By embodied knowledge (Varela, 1999), we refer to tacit knowledge stored in the body, manifesting as intuition (immediate action), automatisms, or artistic expression. This knowledge often eludes verbal articulation in the moment.

The methodologies (systematic approaches to gaining knowledge) aligned with this ontology and epistemology are predominantly ethnographic, participatory, and action oriented. The first part of the study was primarily ethnographic, while the second part employed participatory action research. Action research aims not only to understand reality through change but also views the change itself as a central goal (Reason & Bradbury, 2008, p. 1).

The following data collection methods were employed: participatory and non-participatory observations, interviews, reflection sessions, and informal conversations. These were documented in field notes, reports, observation forms, or audio recordings.

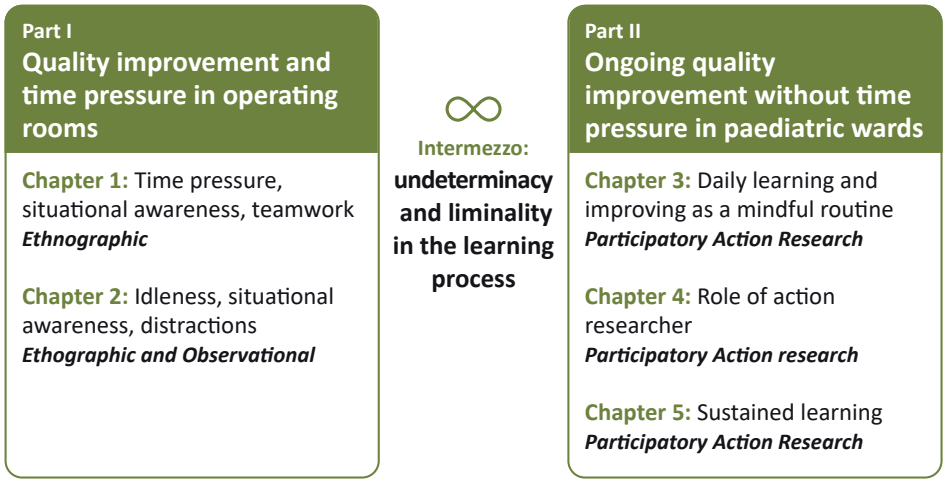
For data analysis, we predominantly employed the method of 'thinking with theory' (Jackson & Mazzei, 2022). This approach underscores the importance of remaining aware of implicit theories and assumptions throughout the interpretative process, while actively incorporating explicit scientific theories to generate novel interpretations of the observed phenomena. Our analytical objective was to adopt a comprehensive perspective based on several interpretations, followed by an intuitive choice for an interpretation that did justice to all stakeholders and provided direction for conclusions and subsequent actions. In the second study, limited statistical analyses were also performed.

GUIDE TO THE READER

The chapters in this dissertation are structured chronologically, following the timeline of the research. Part I addresses Research Question 1: *What is time pressure, and how does it relate to quality improvement within a team?* Part II focuses on Research Question 2: *How can teams contribute to ongoing quality improvement without time pressure?*

At the junction of these two parts, an intermezzo is included, offering a reflection on the crooked paths (indeterminacy and liminality) encountered during the research process. Figure 1 presents the structure and coherence of the dissertation.

Figure 1. Structure of the dissertation



The second chapter **Time pressure in Surgical Teams Improving Patient Safety** presents a naturalistic case study on how time pressure emerges in surgical teams, its interplay with situational awareness (SA), and how it interferes with improvement efforts within the interdisciplinary operating team. The chapter raises further research questions on change methodology, particularly on how to develop habits and align with team members' intrinsic motivations.

The third chapter **An Observational Study of Distractions in the Operating Theatre** explores moments of idleness in the operating room, during which individual team members seek distractions, sometimes to foster team spirit. However, they are often unaware that other disciplines in the team may be busy and require focus. We hypothesize that cross-monitoring—where team members actively observe each other's task execution—is essential for collective situational awareness, crucial for managing and respecting each other's time pressure.

In the **Intermezzo: Pade Crom en Menich Foude** we reflect on the "crooked path" of research, drawing parallels between crafting a tapestry and conducting a PhD study. It metaphorically leads to a garden of new insights, where moments of clarity and joy can be savoured. Concepts of complexity and liminality are introduced serving as a prelude to the second part of the dissertation in which we apply these concepts to changing hospital practices. While changing we search for change methods requiring minimal time investment (Chronos) and preventing the creation of time pressure (Kairos).

The fourth chapter **Interprofessional Learning and Improving at the Paediatric Ward: A Participatory Action Research Practising Safety II Theory** describes that training and

education interventions – such as the Crew Resource Management training in the first chapter - are often perceived as time-consuming and burdensome. Instead, this study focuses on integrating changes into daily routines during bedside rounds, aiming for a natural and minimally disruptive approach. While the team achieved significant progress, new questions emerged: 1. How can daily learning be embedded and expanded across all staff, including new and less frequent members? 2. Can the same results be achieved with less time and resources to make this approach feasible for other departments?

In Chapter 5 **The Participatory Action Researcher: A Starling in the Murmuration,** adopts a complexity perspective on participatory action research and reflects on the role of the researcher. We examine the researcher's contribution through two theoretical lenses: (1) theory on transformation in social complex adaptive systems, to identify developmental patterns; and (2) theory on desires, to analyse the drives underpinning interactions between the researcher and participants. These insights helped to shape the approach in the final study.

In Chapter 6 **Making Change a Habit at the Paediatric Ward, Participatory Action Research** we address the questions for further research from Chapter 4. This study explores how improvements can be anchored and disseminated within the team. It also examines whether participatory action research can be conducted with reduced time and resources.

The dissertation concludes with a general discussion of the conceptual relations between the outcomes of all studies.

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