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Applying different quality and safety models in healthcare improvement work: Boundary objects and system thinking

Siri Wiig [a,*], Glenn Robert [b], Janet E. Anderson [b], Elina Pietikainen [c], Teemu Reiman [d], Luigi Macchi [d], Karina Aase [a]

[a] University of Stavanger, Department of Health Studies, N-4036 Stavanger, Norway
[b] Florence Nightingale School of Nursing and Midwifery, King's College, London, United Kingdom
[c] VTT, Tampere, Finland
[d] VTT, Espoo, Finland

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ABSTRACT

A number of theoretical models can be applied to help guide quality improvement and patient safety interventions in hospitals. However there are often significant differences between such models and, therefore, their potential contribution when applied in diverse contexts. The aim of this paper is to explore how two such models have been applied by hospitals to improve quality and safety. We describe and compare the models: (1) The Organizing for Quality (OQ) model, and (2) the Design for Integrated Safety Culture (DISC) model. We analyze the theoretical foundations of the models, and show, by using a retrospective comparative case study approach from two European hospitals, how these models have been applied to improve quality and safety. The analysis shows that differences appear in the theoretical foundations, practical approaches and applications of the models. Nevertheless, the case studies indicate that the choice between the OQ and DISC models is of less importance for guiding the practice of quality and safety improvement work, as they are both systemic and share some important characteristics. The main contribution of the models lay in their role as boundary objects directing attention towards organizational and systems thinking, culture, and collaboration.

1. Introduction

1.1. Background

In healthcare there has for – at least the last decade – been an ongoing debate about the human contribution to adverse events with an increasing call for changing focus from individual models to systems and organizational approaches to quality and safety [1–5]. Drawing on experience from different industries healthcare has moved in a direction characterized by a greater focus on human factors, organizational learning, modification of staff attitudes, and culture [5]. However, unsafe medical care still causes significant morbidity and mortality globally. Evidence from developed countries shows that between 3% and 16% of all hospitalized patients are harmed by medical care [6].

Improving quality and safety in healthcare is predicated on collaboration between healthcare professionals, managers, and interaction across actors at different system levels [7–10]. There are no easy solutions to the challenge of improving healthcare quality and safety; much depends on the perspectives of users and the attitudes and behaviors of professionals and managers, and the contextual settings of organizations and healthcare teams [11,12]. Implementing evidence based practice or models of improvement is challenging [13], and healthcare managers have generally been slow to adopt and use research evidence [14,15].

The interest in safety theories and accident models (e.g Reason and the Swiss cheese model; Rasmussen and the Socio-technical risk management model), has emerged as a response to the identified need for a system perspective in addressing adverse events in healthcare [16,17]. Safety models have advanced from being based on simple-linear causality to multiple-linearity to non-linearity, and from being exclusively interested in accidents to addressing the normal functioning of an organization. This development illustrates how the frame of reference for thinking about patient safety and accidents has changed in the literature [18,19]. Quality improvement tools (e.g Total Quality Management, Business Process Reengineering, the Institute for Healthcare Improvements model for improvement, Lean thinking, Six Sigma) have been widely used in hospitals to guide quality improvement [10,20–22]. The quality improvement literature is large and diverse, theories and models are not always well defined and healthcare organizations often draw on a range of tools and

* Corresponding author. Tel.: +47 51834288.
E-mail address: siri.wiig@uis.no (S. Wiig).

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principles from different approaches [21]. Research has shown evidence of improvement in quality, but there is no strong evidence of the effectiveness of organization-wide or system programs over a period of time [20]. There is growing awareness that a solely technical approach to quality improvement will not be sufficient to embed and sustain the organizational change necessary to improve quality. Organizational and cultural factors, such as leadership, values and goals, senior management commitment and communication and co-ordination are crucial to the success of quality improvement initiatives [23].

There is an urgent need for targeted and well-designed research to understand the causes of recurring deficiencies in the quality and safety of health care [6], and to develop and test practical solutions. Theoretical models have been applied to guide health services research studies [22], to analyze medical errors, and gain insight and new perspectives into key influences on quality and safety [4,24–26]. There is less knowledge of how healthcare organizations apply theoretical models in their own efforts to improve quality and safety, and the implications of applying different models that originate in different traditions of safety science and quality improvement research.

1.2. Theoretical foundation of improvement models

Attempts to manage quality and safety, whether explicitly or not are always based on underlying theories or models of organizational and human behavior. Theories and models create assumptions, expectations and suggest potential actions, thereby directing attention to some issues more than others [18,27–31]. It is unsurprising therefore that the different models and theories used to guide quality improvement and patient safety work in hospitals often have significant differences potentially leading to diverse results [20,29,30,32,33]. Such theories and models can be compared on a number of dimensions, such as their underlying conceptualization of quality and safety. This can vary from assuming that quality and safety is a product or outcome of certain formal processes or methods to viewing quality and safety as a complex social process involving the human construction of quality and safety [10,18,34,35]. Theories have been categorized as either *impact theories* (describing hypothesis, assumptions, cause, effect and factors determining success or failure) or *process theories* (referring to the preferred implementation activities – how they should be planned, organized, and scheduled to be effective, and how the target group will utilize and be influenced by the activities). The focus of a theory is important. Many theories identify processes that should be undertaken in practice to improve quality and safety, such as implementing interventions or measuring outcomes. These are models of the process [30,31]. Other theories address specific components of the healthcare system such as individuals [36,37], teams or technology (e.g. Carayon, [38] the SEIPS model) which aim to shape how work is conducted. Other models emphasize the organizational domains that must be addressed to fully mobilize the resources required to improve quality in its context [4,39].

1.3. Aim and research questions

The overall aim of this study was to address the current gap in the literature on how healthcare organizations use theoretical models in their own efforts to improve quality and safety. The study describes and compares (1) the theoretical foundation of the models: (a) the *Organizing for Quality* (*OQ*) *model* [10], and (b) the *Design for Integrated Safety Culture* (*DISC*) *model* [40], and (2) explores the practical application of the models and shows how they have been applied to improve quality and safety in practice in two European hospitals – one in England and one in Finland. The choice of the two models to be compared, OQ and DISC, was based on several criteria: our interest in a theoretical comparison of improvement models with origins from different traditions; curiosity in exploring the practical application of dissimilar models in a hospital setting as examples of translating knowledge into practice; and research experience with at least one of the models in hospital settings amongst the authors (including the originators of both the OQ and DISC models).

The following research questions have guided the study:

(1) What are the similarities and differences between the two theoretical models?
(2) What are the similarities and differences between the applications of the models?

By analyzing the theoretical foundation of the OQ and DISC models, and exploring how they have been applied, we illustrate how they can contribute to improvement processes in practice. By discussing the usefulness and role of theoretical models in hospital settings and reflecting on how to select a model to underpin improvement work, the study contributes to better understanding of the translation of knowledge [41,42] and theoretical models into practice.

2. Methodological approach

2.1. Research strategy

In this study we use a research strategy involving a theoretical comparison of the OQ and DISC models, and a retrospective comparative case study approach [43] of two hospitals, one in England and one in Finland. The English case study explores how the OQ model was applied in practical hospital improvement work, while the Finnish case study covers the application of the DISC model. There are diverse perspectives with regard to the meaning of 'case' and 'case study' in the literature [44–46]. In this study, cases are conceived as empirical units existing prior to the study, not as theoretical constructs developed in the course of the research process. The hospitals are the empirical units defined as the cases which are scrutinized to explore how the two different theoretical models contribute to the improvement of quality and safety processes in the specific hospital contextual settings. The case study research strategy is preferable when exploring a complex phenomenon, and enables the researcher who deliberately wants to cover contextual conditions to incorporate them in a holistic manner [43,47]. In this study, the latter is of particular importance, as we cover quality and safety improvement processes that occurred in two different hospital contexts that are; complex and interconnected involving multiple organizational interfaces; and influenced by contextual conditions such as professional interests, previous competence, political and financial pressure, technological development, and leadership [48,49]. Consequently, there is a need for a flexible research strategy in order to understand how the two theoretical models were adopted and used to improve quality and safety in practice [43].

2.2. Data collection

The data informing our study are based, firstly, on literature relating to the OQ and DISC models [10,40], and secondly, on retrospective analysis of the results of interviews, surveys and document analyses undertaken in our two case study hospitals [50]. Different approaches were used in the case study hospitals and the methods used were informed by an action research approach [51–53].