



The patient safety chain: Transformational leadership's effect on patient safety culture, initiatives, and outcomes

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ABSTRACT

The purpose of this study is to investigate the existence of a patient safety chain for hospitals. Drawing on high reliability organization theory, multifactor leadership theory and total quality management literature, we develop and test a model for improving patient safety – a critical issue facing hospitals today. Specifically, we hypothesize that improving patient safety begins at the highest level of the organization with a transformational leadership style. This leads to a sequence of linkages whereby transformational leadership has an important relationship with creating a culture of safety, which in turn is associated with the adoption of patient safety initiatives, and ultimately with positive improvements in patient safety outcomes. Using data from a nationwide survey of over 200 hospitals, we use structural equation modeling to provide empirical support for the effectiveness of this patient safety chain model. The results have major implications for enhancing operations in hospital settings.

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1. Introduction

Some organizations require great attention to preventing mistakes because errors could have serious implications to public safety. High reliability organizations (HROs) refer to organizations or systems that operate in complex and hazardous conditions and yet consistently achieve nearly error-free performance. They are termed HROs because they seem to function in a more reliable fashion than other similar organizations. Classic examples of HROs can be found in the aviation industry, the nuclear power industry, and some sections of the military. Failure rates in these organizations are much lower than those found in healthcare, an industry where injury to the public is a major concern. Healthcare organizations would benefit from operating as HROs. We propose that HRO status can be achieved through a systematic process linked to top

leadership. We empirically test this proposition by building a model for improving patient safety in hospitals.

Although operations management traditionally has been concerned with improving quality and reducing defects in manufacturing settings, recent research in this field has expanded to include the study of errors and safety in service industries such as aviation and healthcare (e.g., Barnett and Higgins, 1989; Tucker, 2004). Product defects in manufacturing are synonymous with operational failures in aviation or healthcare, which have the potential to impact public safety. Safety is a critical component of quality improvement, and the term “operations safety” has emerged as a new and growing area of interest in the field (McFadden and Hosmane, 2001). Since Brown (1996) encouraged researchers to adopt safety in research agendas, and Bretthauer (2004) stressed the need for more service research on improving safety in healthcare, the problem of medical errors and their consequences is now receiving more attention in operations management literature (e.g., Tucker, 2004; Gowen et al., 2006).

Healthcare has become one of the largest service sectors of our economy, accounting for about 15% of Gross

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Domestic Product and providing the greatest number of new jobs of any industry in the United States (Mandel, 2006). Improving patient safety is one of the most highly publicized and critical issues facing this industry today. Although patient safety, defined by the National Patient Safety Foundation as “the avoidance, prevention and amelioration of adverse outcomes or injuries stemming from the process of healthcare,” is not a new concept, the first report issued by the Institute of Medicine (IOM), entitled *To Err is Human: Building a Safer Health System* (IOM, 2000), broke the silence that had originally surrounded medical errors and their consequences. Their findings indicated that as much as 58% of the 98,000 error-related deaths that occur annually may be preventable. Consequently, the IOM recommended rigorous and widespread changes in healthcare processes. In addition, in November of 2000, The Leapfrog Group was established by a coalition of major employers in order to initiate breakthrough improvements in safety and reduce preventable medical errors, which are defined as “the failure of a planned action to be completed as intended (i.e., an error of execution) or the use of a wrong plan to achieve an aim (i.e., an error of planning)” (IOM, 2000, p. 28). The Leapfrog Group and the IOM reports, along with the Joint Commission’s adoption of patient safety standards and patient safety goals (Joint Commission, 2009) have put serious pressure on hospitals to develop patient safety initiatives (PSI) designed to reduce medical errors. Nonetheless, hospitals have been slow in meeting patient safety goals and inconsistent in implementing safety systems (Longo et al., 2007), despite the unprecedented focus on patient safety over the last 10 years.

Prior to the first IOM report (2000), most efforts to reduce errors and improve patient safety focused on individuals rather than systems or processes (Woodhouse et al., 2004). In 1984, Perrow argued that about 70% of accidents in general were associated with human error. This error rate was substantiated in the highway traffic safety literature (Brehmer, 1990), as well as in aviation safety research (McFadden and Hosmane, 2001). Although humans often play a role in the occurrence of errors, the first IOM report used the popular adage of Alexander Pope – to err is human – to make the point that blaming individuals for being human is not an effective way to improve patient safety. Recent evidence now suggests that the majority of errors more accurately stem from system and process failures as opposed to human failures (Reason, 1990; Chassin and Becher, 2002; Gaba et al., 2003; Tucker, 2004). With this new focus on systems and processes has come the identification of more effective methods for improving patient safety, including redesigning the hospital work environment, modifying systems and processes to make them more redundant, and implementing PSI, or activities intended to prevent or ameliorate adverse outcomes or injuries stemming from the process of healthcare.

Empirical studies have found fewer medical errors tend to occur in hospitals that embrace a culture of safety (Katz-Navon et al., 2005), possess a group-oriented organizational culture (Stock et al., 2007), and implement PSI (McFadden et al., 2006a). Further research has shown the costly impact of medical errors, both financially (to the tune of \$51,000 to

\$27 million per year for a 204-bed hospital at 75% occupancy) and in terms of customer dissatisfaction, hindrance to employees, and reduction of quality of care (Tucker, 2004). Of particular relevance to the present study, McFadden et al. (2006a) identified several barriers to the implementation of PSI in hospitals, including lack of top management support, lack of resources, lack of incentives, and lack of knowledge. On the other hand, something as simple as perceived importance of PSI was shown to facilitate their implementation.

Given this increased emphasis on improving patient safety, this study seeks to identify a clear model of patient safety and its foundations. Specifically, this paper builds on high reliability organization theory (HROT) by testing the existence of a systematic process that is linked to safety improvements in hospitals. Although no empirical evidence currently exists in the literature to support a patient safety chain model, the prevailing research tends to substantiate such a concept. The unique contribution of this paper is to demonstrate that the patient safety chain can provide an impetus for healthcare organizations to achieve HRO status. Therefore, we use the terminology “patient safety chain” to reinforce that the focus of our paper is the model as a whole – a chain of mediated relationships, rather than the individual links in the chain (a set of bivariate relationships), as we follow the theme of HROs throughout our discussion of the model. Specifically, we propose that improving safety begins with top management’s support of such efforts through the use of transformational leadership (TFL), the effects of which will “trickle down” through the links in our proposed chain, being ultimately related to improved safety outcomes. Following HROT’s emphasis on leadership as an important factor in creating an HRO, this study provides evidence that hospitals wishing to reduce errors will need to focus their energies towards this top “link” in the chain. Specifically, we propose that TFL in hospitals will be associated with the creation of a patient safety culture (PSC), which then corresponds with the adoption of PSI and ultimately with positive improvements in patient safety outcomes (PSO). In the following section, we examine the literature that supports our theory.

2. Conceptual background

2.1. TFL and PSC

HROT is based on the idea that errors can be prevented through top leadership commitment and an organizational culture of reliability (La Porte, 1996). In contrast, Normal Accident Theory is based on the belief that accidents are inevitable or “normal,” and takes a rather pessimistic approach about the possibility of effectively preventing errors in complex environments (Perrow, 1984). HROT has identified senior leadership behavior and attitudes as being linked to high reliability (La Porte, 1996; Roberts et al., 2001). Moreover, it is believed that HROs have less error because they have embraced the notion of a “safety culture,” or a culture of reliability, and researchers argue that creating redundancy of systems, training, and learning can result in improvements in safety, even for a complex, tightly coupled

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