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Contents lists available at ScienceDirect

Journal of Safety Research

journal homepage: www.elsevier.com/locate/jsr

www.nsc.org

Q1 The relationship between patient safety climate and occupational safety climate in healthcare – A multi-level investigation

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ARTICLE INFO

Article history:

Received 11 August 2015

Received in revised form 1 December 2016

Accepted 28 February 2017

Available online xxxx

Keywords:

Safety culture

Organizational climate

Patient safety

Occupational safety

Multi-level analysis

ABSTRACT

Introduction: Patient safety climate/culture is attracting increasing research interest, but there is little research on its relation with organizational climates regarding other target domains. The aim of this study was to investigate the relationship between patient safety climate and occupational safety climate in healthcare. *Method:* The climates were assessed using two questionnaires: Hospital Survey on Patient Safety Culture and Nordic Occupational Safety Climate Questionnaire. The final sample consisted of 1154 nurses, 886 assistant nurses, and 324 physicians, organized in 150 work units, within hospitals (117 units), primary healthcare (5 units) and elderly care (28 units) in western Sweden, which represented 56% of the original sample contacted. *Results:* Within each type of safety climate, two global dimensions were confirmed in a higher order factor analysis; one with an external focus relative the own unit, and one with an internal focus. Two methods were used to estimate the covariation between the global climate dimensions, in order to minimize the influence of bias from common method variance. First multilevel analysis was used for partitioning variances and covariances in a within unit part (individual level) and a between unit part (unit level). Second, a split sample technique was used to calculate unit level correlations based on aggregated observations from different respondents. Both methods showed associations similar in strength between the patient safety climate and the occupational safety climate domains. *Conclusions:* The results indicated that patient safety climate and occupational safety climate are strongly positively related at the unit level, and that the same organizational processes may be important for the development of both types of organizational climate. *Practical applications:* Safety improvement interventions should not be separated in different organizational processes, but be planned so that both patient safety and staff safety are considered concomitantly.

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1. Introduction

The present study addresses the relationship between two types of organizational climate in healthcare, focusing on different outcome domains: occupational safety and patient safety.

Occupational injuries present a severe problem in most countries, ethically as well as economically, and this clearly is the case in healthcare. In Sweden in 2015, 15 per 1000 female auxiliary nurses and nurse's aides suffered occupational injuries leading to at least one day of absence from work. The corresponding number for females in all occupational branches was 6 per 1000 (SwedishWorkEnvironmentAuthority, 2016). Adverse events in

healthcare, affecting the safety of the patients, are also acknowledged as a substantial problem (WHO, 2014). A study based on reviews of medical records in Swedish hospital care in 2013 showed that events resulting in patients getting harmed in hospital care occurred in approximately 15% of all admissions (Swedish Association of Local Authorities and Regions, 2013). Similar results have been presented regarding other countries (Vincent, Neale, & Woloshynowych, 2001; Weingart, Wilson, Gibberd, & Harrison, 2000). In most industrialized countries, the healthcare sector is under heavy economic pressure, with demands for rationalizations all at the same time as the demand for care is increasing due to demographics. Also, the ability to provide high quality care is continuously increasing due to medical and technical advancements, but at an ever increasing cost. Reducing occupational and patient care injuries would reduce suffering as well as make resources available for maintaining an adequate quantity of high quality care.

Improvement of patient safety is currently receiving increasing interest in healthcare organizations, but so far the focus has largely

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been on improving routines and introducing new equipment. Vincent (2009) stated that interventions to improve patient safety have not paid sufficient attention to social and interpersonal issues, and that this lack partly may explain the variable impact of interventions. A fair amount of previous research has also been directed toward reducing occupational injuries in healthcare, particularly back injuries and needle sticks (c.f., Agnew, Flin, & Mearns, 2013; Taylor et al., 2012; Yassi & Hancock, 2005). But social and psychological phenomena are also important for developing occupational safety in healthcare (Iedema, 2009). Social phenomena, such as the organizational climate, may help to explain the emergence of social behavioral norms and may thus have large influence on staff priorities and behaviors that may affect both patient and staff safety (Kuenzi & Schminke, 2009). Researchers have also emphasized the importance of taking different levels of the care system into account in interventions for better patient safety (Benn et al., 2009; Iedema, 2009). Organizational safety climate is generally considered to have its main source in workers' interpretations of management priorities (Neal & Griffin, 2002), but relations and interactions at the workgroup level also need to be considered (Fugas, Silva, & Meliá, 2012; Kines et al., 2011). Concomitantly considering patient safety and staff health and safety is one way of broadening the perspective on how to improve quality in healthcare. Support for this, and for an organizational climate approach for doing so, is offered in a study by Ancarani and coworkers (Ancarani, di Mauro, & Giammanco, 2009). These authors applied the competing values framework (Quinn & Rohrbaugh, 1983) and found that satisfaction among patients in hospital care was the highest in wards characterized by a human relations value profile (i.e., where work group cohesion, teamwork and morale were important, as were caring and equity among staff, and where these ends were attained through open communication and participative decision-making). Furthermore, studies by Speroff et al. (2010) and Hartmann et al. (2009) have showed that an organizational culture characterized by a human relations value profile (in these studies labeled as a group culture) was related to a high patient safety climate.

1.1. Organizational climate and occupational safety

According to organizational climate theory, perceptions of policy, procedures, and practices are collectively interpreted in the workgroup through communication and social interaction. In this manner, members of a workgroup create shared theories on how the world is ordered, and the individual uses these theories as a frame of reference for own behavior (Schneider, 1975). Schneider stated that organizational climate is domain specific, and that each type of climate therefore should be studied in relation to its specific outcome. Occupational safety climate is such a domain. It regards aspects of the organizational climate that are of relevance for workplace safety, and has been defined as workgroup members' shared perceptions of policy, procedures, and practice in relation to occupational safety in the organization (Neal & Griffin, 2002; Zohar, 1980). Through communication and social interaction within the group, shared meaning and perceived order develop regarding how occupational safety is and should be valued and handled. Through such social processes the shared climate perceptions contribute to the development of social norms related to occupational safety at the workplace, influencing individual behavior. In a workgroup where the shared occupational safety climate is high one may thus expect higher levels of safety behavior and a lower occupational injury rate than in a group where this safety climate is low. There is also strong empirical support for these assumptions in healthcare (Neal & Griffin, 2006), as well as in a variety of other occupational branches (Beus, Payne, Bergman, & Arthur, 2010; Christian, Bradley, Wallace, & Burke, 2009; Clark, 2006; Glendon, 2008; Kuenzi & Schminke, 2009; Larsson-Tholén, Pousette, & Törner, 2013).

1.2. Organizational climate and patient safety

Organizational climate regarding patient safety has attracted increasing research interest in recent years, and there is empirical support for the influence on patient safety of patient safety climate (Kuenzi & Schminke, 2009; Steyrer, Schiffinger, Huber, Valentin, & Strunk, 2012) and the related concept, patient safety culture. Based on a literature review, Scott, Mannion, Marshall, and Davies (2003) stated that in 4 of 10 included studies a positive relation was found between organizational culture and good care, and none of the other six studies rejected such a relation. Obviously, good prescribed routines and procedures are important for patient safety, but the degree of detail in such regulations must be adequate, and also here good results appear to be dependent on patient safety climate. The results by Scott et al. indicated that both too low and too high a degree of detail in prescribed safety procedures increased the risk of mistakes in healthcare, and that this relation seemed to be stronger in care units with a low patient safety climate.

1.3. Interaction between occupational safety climate and patient safety climate

Few organizations have one single goal to accomplish. Rather, in order to be successful in the longer term, organizations must be able to combine several goal areas. Unfortunately, this has been little reflected in organizational climate research, which generally studies one domain at a time. In order to further develop organizational climate theory there is a need for research studying the interaction between different domain specific types of climate (c.f. Zohar, in Kuenzi & Schminke, 2009). Also, in most healthcare organizations, in Sweden and presumably in many other countries, patient safety and human resource issues are administered in different organizational tracks, by different functional unit with a low degree of cooperation. Better understanding of the relationship between occupational safety and patient safety may therefore indicate how the cooperation between different healthcare functions can become synergistic in promoting both staff and patient safety.

Positive relations between occupational safety climate and patient safety climate are highly feasible. A theoretical model presented by Flin (2007); see Fig. 1) suggested that a generic safety climate could be expected to have a similar effect on patient safety and staff safety in healthcare. The quality of the safety climate was hypothesized to influence the propensity for risk taking behavior in general, for rule compliance, incident reporting, and for voice behavior. These types of behavior would then be of consequence for patient or staff safety, depending on the situation.

According to the model in Fig. 1, a good generic safety climate would positively influence both staff safety and patient safety, but the model has not, to our knowledge, been tested in empirical research. A study by Hofmann and Mark (2006) lends some support for the model. They found that a good safety climate (without specification of the safety target) operationalized as few work goals conflicting with safety; social status being related to acting safely; management safety priority and safety commitment; open communication at the workplace; openness regarding mistakes; and just treatment in analysis of mistakes, were important in regards to both patient safety and staff safety, particularly in the care of patients with complex conditions. Two more recent studies have also reported similar associations between patient safety climate, and patient as well as worker safety outcomes. Agnew et al. (2013) found that hospital safety climate scores (measuring patient safety climate) were positively associated with clinical workers' safety behavior and negatively associated with patient and worker injuries. Furthermore, Taylor et al. (2012) found a negative association between two patient safety climate dimensions as measured by the Safety Attitude Questionnaire (SAQ), and a specific patient injury (decubitus ulcers) and nurse injuries (reported needle-stick, splash, slip, trip or

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