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How can we decrease burnout and safety workaround behaviors in health care organizations? The role of psychosocial safety climate

The role of
psychosocial
safety climate

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Abstract

Purpose – Conducted with a staff of 562 persons working in the health sector in Quebec, mainly nurses, the purpose of this paper is to test the indirect effects of psychosocial safety climate (PSC) on workarounds through physical fatigue, cognitive weariness and emotional exhaustion as mediators.

Design/methodology/approach – The structural equation method, namely CFA, was used to test the structure of constructs, the reliability and validity of the measurement scales as well as model fit. To test the mediation effects, Hayes's PROCESS (2013) macro and 95 percent confidence intervals were used and 5,000 bootstrapping re-samples were run. The statistical treatments were carried out with the AMOS software V.24 and SPSS v.22.

Findings – The results based on bootstrap analysis and Sobel's test demonstrate that physical fatigue, cognitive weariness and emotional exhaustion mediate the relationship between PSC and safety workarounds.

Practical implications – The study has important practical implications in detecting blocks and obstacles in the work processes and decreasing the use of workaround behaviors, or in converting their negative consequences into positive contributions.

Originality/value – To the authors' knowledge, this is the first study to examine the relationship between PSC, burnout and workaround behaviors. These results could contribute to a better understanding of this construct of workarounds and how to deal with it. Moreover, the test of the concepts of PSC in this study provides support for the theory of "conservation of resources" by proposing an extension of this theory.

Keywords Quantitative, Psychosocial safety climate

Paper type Research paper

1. Introduction

Although the notion of "workarounds" comes from the field of information technology, it is now used in the health care sector given the complexity and particularities of the care activity (Eisenhauer *et al.*, 2007; Halbesleben *et al.*, 2008). Morath and Turnbull (2005) consider that health workers are "masters" of workarounds. The care sector is a "high-hazard industry" in which employees' actions could lead to injury or even to the death of the patient (McNulty *et al.*, 2009). Work in healthcare organizations is characterized simultaneously by routine, highly structured and ultra-safe practices, but also by irregular, erratic and harmful demands. Practitioners have to learn on the job at the same time as they have to display professional autonomy (Debono *et al.*, 2013).

These characteristics of healthcare organizations translate into employees' work, behaviors and responses to the demands of clinical practice (Debono *et al.*, 2013). Indeed, it seems that healthcare organizations, especially hospitals, have developed a large number of standardized routines, policies and technologies that seek to standardize practitioner's practice, make patients safer and save hospitals' financial resources (Halbesleben *et al.*, 2008). However, facing the complexity of care within a system that increasingly requires standardization, "employees develop inconsistent and idiosyncratic work patterns that they believe increase their performance and patient safety" (Wheeler *et al.*, 2012, p. 547). These practices are called "workarounds." In other terms, an employee develops an alternative



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work procedure to address a block in his or her workflow (Halbesleben, 2010) without analyzing why this blockage is happening (Finkelman and Kenner, 2012).

Workers in health care organizations thus develop workaround behaviors in response to four factors they perceive: prevent or weaken the care they provide for their patients; are not in the best interest of their patients; make the realization of their job difficult or longer; or potentially threaten professional relationships (Debono *et al.*, 2013).

Berlinger observed that nurses or other health professionals who choose to work around work processes may not do so intentionally, but rather can even consider it to be part of patient safety (Berlinger, 2016). Thus, workaround behaviors can be understood either as an advantage or as unsafe practices; they can also have impacts on patient care quality and safety (Lalley, 2013). On the one hand, workarounds can make a worker feel efficient and able to manage complicated rules that appear to slow the process and the attainment of work goals. This behavior may never actually lead to injury. However, workers may consider it risky to discuss the fact that they work around rules or sometimes violate instructions given by the employer (Berlinger, 2016). Another positive consequence of workarounds is that they make it possible for employees to develop creative solutions and more efficient work processes (Lalley and Malloch, 2010). They can also draw attention to practices or blocks or obstacles in workflows that need to be corrected (Vestal, 2008).

According to Morath and Turnbull (2005), however, research on workarounds indicates that these behaviors can create an environment which is risky, one that can lead to less reliability of the preventive systems put in place by the organization in order to protect workers, patients and hospitals. Tucker *et al.* (2014) show that workers in some sectors may spend as much as 10 percent of their work time working around operational failures. As workarounds are created under the pressure to respect rules or meet other work demands, they can also have negative consequence such as medical errors, which can subsequently lead to injuries (Halbesleben, 2010), or even patient death.

The issue of workarounds is especially relevant to organizations in the context of increased emphasis on creating high reliability health care organizations (Halbesleben *et al.*, 2008). Unfortunately, despite the possibility of tragic results stemming from workarounds in the course of medical practice, academic researchers' interest in the topic has not gone much beyond simply documentation of its existence (Halbesleben and Rathert, 2008). According to Halbesleben and Rathert (2008), there are very few studies that examine the antecedents of workarounds.

For example, recently, research has shown that several factors have, over time, contributed to the development of workaround behaviors. These include heavy workloads (Westphal *et al.*, 2014; Lopez *et al.*, 2010); a negative organizational climate characterized by poor leadership; few opportunities for professional development; a lack of involvement of nurses in decision-making; a lack of perceived human resources management and support (Wheeler *et al.*, 2012; Koppel *et al.*, 2008; Fogarty and McKeon, 2006; Tucker and Edmondson, 2002); and incompatibilities between organizational policies and safety or technology (Koppel *et al.*, 2008; Schoville, 2009).

However, Debono *et al.* (2013) indicate in their scoping review of workarounds that "there are still relatively few peer reviewed studies examining nurses' workaround behaviors as a primary focus" (Debono *et al.*, 2013, p. 12). These authors also found that in general, researchers indicate the potential effects of workaround behaviors rather than provide empirical evidence of their actual impact (Debono *et al.*, 2013). To fill these gaps, our research responds to the call for additional research on workarounds by Rathert *et al.* (2012) and Debono *et al.* (2013), as well as a need for replication in additional bigger samples (Halbesleben, 2010).

Our study contributes to the extant literature and to practice in significant ways. First, Rathert *et al.* (2012) have studied the effects of many work environment factors (teamwork, job autonomy and time pressure) on one of the factors of burnout (exhaustion)

and on workaround behaviors. Our research goes further by examining the effect of the psychosocial safety climate (PSC) on workarounds, a relationship that was not examined previously. Moreover, Rathert *et al.* (2012) have studied only one factor of burnout (exhaustion); our study examines three dimensions of burnout (emotional exhaustion, physical fatigue and cognitive weariness) (Shirom and Melamed, 2006). For example, physical workload can lead to more physical fatigue while cognitive workload can lead to more cognitive weariness. Distinguishing between these dimensions of burnout and their links to workarounds can provide more refined results, so that action levers can be concentrated on certain tasks. To our knowledge, no study has ever tested such a model, despite the contribution such a model can have in enhancing our understanding of burnout and workarounds. This is important, considering the impact these workarounds may have on patient safety and injuries (Halbesleben, 2010).

Indeed, this study proposes a new pathway through which health care organizations can have an influence on employees' and patients' health. It suggests that the PSC can be considered a resource passageway, which stimulates employees' conservation and acquisition of resources. PSC can be defined as shared perceptions regarding practices, procedures and policies reflected in management commitment, organizational communication, management priority and organizational participation concerning the psychosocial health workers in the workplace (Idris *et al.*, 2014). This in turn can decrease burnout and perhaps the practice of workarounds. Indeed, clinicians are more likely to participate in workarounds as a result of reductions in resources for investment in prescribed work processes (Halbesleben and Bellairs, 2015).

In addition, Wheeler *et al.* (2012) suggest that inadequate resources make employees more likely to disengage from their work, reflect on leaving their job, be less motivated to follow hospital rules, and be more likely to practice workarounds to make work easier. Thus, evidence that PSC affects workarounds through physical fatigue, cognitive weariness and emotional exhaustion is an important contribution for both researchers and practitioners. Because little is known about nurses' use of workaround behaviors, this study can therefore provide empirical evidence and find additional underlying sources for workarounds, instead of merely documenting potential causes or effects of these presumably unsafe behaviors. This can advance the knowledge of this topic by encouraging other researchers to expand work in this domain, as more research is clearly needed.

Second, although the JD-R model of Demerouti *et al.* (2001) was used as a theoretical framework for the study of the concept of PSC (e.g. Idris *et al.*, 2015; Garrick *et al.*, 2014; Law *et al.*, 2011), this research mobilizes the theory of "conservation of resources (COR)" (Hobfoll 1989, 1998), and in particular the concept of "resource caravan passageways," also proposed by Hobfoll (2011, 2012), yet not yet explored (Halbesleben *et al.*, 2014).

Third, and from a more practical point of view, as the consequences of workarounds can be positive as well as negative, the results of our study can provide a better understanding for politicians and decisions makers on how to deal with workarounds. For example, by considering the PSC as an organizational tool, health organizations can prevent negative workaround behaviors via a good system of communication. Organizations could try prompting positive workaround behaviors via management commitment and giving priority to support and discuss with employees in order to develop creative solutions on the basis of workarounds behaviors.

2. Literature review

2.1 The COR theory

The COR theory considers that individuals try to build, protect and acquire things they value and deem important for survival. These elements, which Hobfoll calls resources, play a role in enabling people to cope with stressful events and respond to job demands

(Hobfoll, 1998). These include health, well-being, family, self-esteem, and a sense of purpose and meaning in life (Hobfoll *et al.*, 2018). Hobfoll categorizes resources in four categories:

- (1) personal resources (e.g. key skills and personal traits, self-esteem);
- (2) object resources (e.g. car, house);
- (3) condition resources (e.g. employment, tenure); and
- (4) energy resources (e.g. money, knowledge) (Hobfoll *et al.*, 2018).

Stress or burnout occurs when resources are lost, threaten to be lost or when there is a bad return on investment in resources (Hobfoll, 1989). Many principles characterize the COR theory. First, “loss of resources happens when resources are not only vulnerable to the loss of resources, but the initial loss results in future losses.” Second, Hobfoll (1998, p. 82) also states that “those with a lot of resources are more likely to win new resources, and that initial gains lead to future gains.” This refers to the “spiral of gain” of resources. Third, “resource loss is disproportionately more salient than resource gain” (Hobfoll *et al.*, 2018, p. 106). Fourth, “people must invest resources in order to protect against resource loss, recover from losses, and gain resources” (Hobfoll *et al.*, 2018, p. 106). Fifth, “when people’s resources are overstretched or exhausted, they enter a defensive mode to preserve the self which is often aggressive, and may become irrational” (Hobfoll *et al.*, 2018, p. 106). In addition, COR theory postulates not only that resource loss is more meaningful in magnitude than resource gain, but also that resource losses tend to affect people more rapidly (Hobfoll *et al.*, 2018). Hobfoll (2011, 2012) thus proposes an extension of his theory by presenting the notion of “resource caravan passageways.” This refers to the: [...] environmental conditions that support, foster, enrich, and protect the resources of individuals, sections or segments of workers, and organizations in total, or that detract, undermine, obstruct, or impoverish people’s or group’s resource reservoirs (Hobfoll, 2011, p. 129). Hobfoll therefore puts the accent on the role of the environmental and developmental conditions which make them highly correlated, such that “resources do not exist individually but travel in packs, or caravans, for both individuals and organizations” (Hobfoll *et al.*, 2018, p. 106). In other words, resources tend to accumulate and link together, creating “resource caravans” (Salanova *et al.*, 2010). Hobfoll’s (1989, 1998) COR theory is the basis for this research, which analyzes the mediating effect of burnout between PSC and workarounds. It provides a global perspective to understand the nature of stress at the individual level. Mansour and Tremblay (2016) consider family friendly practices and supervisor support as a resources caravan passageway to alleviate work-family interference and burnout. In our study, we consider PSC as a resource caravan passageway that can conserve and protect resources and/or compensate the low level of resources by reducing the negative effects of job demands which, at times (particularly in the health care sector) may be unavoidable.

2.2 Conceptual clarification

2.2.1 Psychosocial safety climate.

Considered as a facet-specific component of the organizational climate, PSC is seen as an organizational climate composed of individual perceptions regarding practices, procedures and policies. These are reflected in management commitment, organizational communication, management priority and organizational participation concerning the value of the psychosocial health and safety of employees in the workplace (Idris *et al.*, 2014; Dollard, 2012; Dollard and Bakker, 2010; Zadow and Dollard, 2015). Indeed, to enhance PSC, senior management supports workers’ psychological health, prioritizes the psychological health of employees over productivity, and commits to and supports psychological health and well-being (Hall *et al.*, 2010). Moreover, prompting a strong PSC implies an effective system of communications in

organizations at all levels where senior management communicate with employees about issues that may affect psychological health and safety, and employees communicate occupational health, safety concerns, and how this process is reflected in policies and procedures (Zadow and Dollard, 2015). According to these authors, a strong PSC also requires the participation and consultation of stakeholders including employees, unions and health and safety representatives in the occupational health and safety process. Therefore, in organizations where the level of PSC is high, employees feel that their psychological safety and well-being are protected, prioritized and supported by senior management (Bond *et al.*, 2010). Furthermore, they have the sense that their concerns regarding their psychological health can be addressed, discussed and communicated at all levels of the organization without fearing sanctions.

While the construct of PSC appears to share some similarities with other safety climate constructs (Zohar, 1980) and team psychosocial safety (Edmondson, 1999; Idris *et al.*, 2011), PSC actually is a new construct (Idris *et al.*, 2014). The difference between PSC and other organizational climate concepts is that the latter is less specific in predicting outcomes (Carr *et al.*, 2003). Indeed, PSC is seen as an antecedent to working conditions (job demands-resources (JD-R)), or more specifically, psychosocial risks. These in turn provoke impairment to psychological health (Dollard and Bakker, 2010; Hall *et al.*, 2010; Idris *et al.*, 2014).

Many researchers including Dollard and Bakker (2010) and Bond *et al.* (2010) demonstrate that PSC is a valid and reliable construct concerning working conditions and psychological health problems. Moreover, safety climate, another construct of organizational climate, refers to employees' perceptions of the climate for physical health and safety (Zohar, 1980). Dollard and Bakker (2010) differentiate the PSC from the safety climate in relation to psychological health and safety. Furthermore, according to these latter authors, PSC can affect not only interpersonal factors but a variety of psychosocial risk factors (e.g. work pressure, job control), which differentiates PSC from other forms of climate (e.g. team psychological climate, Edmondson, 1999).

2.2.2 Burnout. Burnout is one of the major consequences of work-related stress in organizations and has been considered a useful concept for work-related stress researchers and practitioners in human resource management (Hobfoll and Shirom, 1993). It was first recognized among women and men working in the care professions and is now linked to many jobs and professions (Burke *et al.*, 2010). Burnout is the result of a long experience of stress or permanent organizational factors that lead to repetitive stress which, ultimately, depletes the resources of individuals (Maslach and Schaufeli, 1993).

Authors (Maslach *et al.*, 1996, 2001) define burnout as a process in which the individual first suffers from erosion of emotional resources; this then leads to disengagement from the tasks assigned, by introducing a phase of cynic depersonalization, which leads to an absence of fulfillment at work (Lee and Ashforth, 1996; Maslach and Jackson, 1981). According to this perspective of burnout, three dimensions can be identified: emotional exhaustion, depersonalization and personal accomplishment. Emotional exhaustion refers to a weakening of physical, psychological and emotional resources of individuals in dealing with work demands that exceed their adaptive capacity to work (Halbesleben and Bowler, 2007; Lee and Ashforth, 1996). Depersonalization, also called cynicism or disengagement, is the response to emotional exhaustion (Halbesleben and Buckley, 2004). Personal accomplishment refers to individuals' fruitful achievement, skills and sufficiency at work (Maslach and Jackson, 1986). This perspective of burnout is very criticized in the literature. Indeed, Maslach himself considered that this definition of burnout "did not derive from an existing theory, but was developed on the basis of several years of exploratory research" (Maslach, 1993, p. 2). In addition, Hobfoll and Shirom noted that the definition of Maslach

et al. (1996) “may confound the core meaning of the concept of burnout with features of the coping process with it or with a consequence of it, respectively, by adding the depersonalization and personal accomplishment” (Hobfoll and Shirom, 2000, p. 67). Shirom and Melamed (2006) used the COR theory (Hobfoll, 1989, 1998) to explain the depletion of energetic resources and the nature and development of burnout (Qiao and Schaufeli, 2011).

The definition of burnout adopted by Hobfoll and Shirom (1993) refers to the process of wearing out and wearing down a person’s intrinsic energetic resources, or the combination of emotional exhaustion, cognitive weariness and physical fatigue. Hobfoll and Shirom (1993) consider this definition as a more coherent definition of the core concept of burnout, as they noted “the combination of emotional exhaustion, physical fatigue, and cognitive weariness represents a coherent set of resource loss that does not overlap with any other established behavioral science concept” (Hobfoll and Shirom, 2000, p. 67).

The notion of physical fatigue is consistent with the links between stress and physical health problems and some musculoskeletal disorders (Shirom and Melamed, 2006). With this element, Shirom and Melamed (2006) ensure that an important part of what characterizes a situation and a state of burnout is taken into account. The second component of burnout is cognitive weariness; this refers to the difficulties experienced by the individual in concentrating and rapidly mobilizing his intellectual capacities in the context of strain and organizational constraints. As for emotional exhaustion, it considers the erosion of resources of an individual struggling to cope with a threat on his well-being which comes from his working environment (Shirom and Melamed, 2006). We thus retain the definition of Shirom and Melamed (2006) in our study.

3. Research hypotheses

3.1 PSC and workarounds

PSC can be seen as “resource caravan passageways.” Indeed, according to the COR theory, the ability of individuals and groups to build and protect their bank of resources (or conversely to lose their resources) is largely dependent on circumstances beyond their control (Hobfoll and deJong, 2013). In other words, PSC as a “passageway” can constitute an organizational tool or key resource that prompts the individual motivational pathways via the group’s or team’s resources because it makes it possible to protect existing resources (conservation), or develop new resources (acquisition of resources), thus creating the phenomenon of resource caravans (Hobfoll, 2011). According to the “spiral of resource gains” of Hobfoll (1998, p. 82), obtaining resources can lead to acquiring more new resources or preventing the loss of resources. For example, in certain organizations, PSC may be high because of the presence of policies, procedures and practices to identify and resolve problems that threaten psychosocial well-being. In such cases, managers, supervisors or assistant head nurses, in their team or department will be encouraged to care about employees’ health and attempt to satisfy the basic human needs of staff (Idris *et al.*, 2015), including well-being at work. By taking care of the health and psychosocial safety of employees, management provides employees with various resources for their work and employment situation, which will lead to more stable and safer working conditions (Idris *et al.*, 2011).

Therefore, a psychologically safe environment allows for the creation of clear and safe boundaries in which employees are more likely to speak up, discuss and learn from conditions which ultimately decrease safety errors (Edmondson, 1999, 2004). Moreover, the link between PSC and workarounds can also be explained in terms of the dimensions of PSC, such as organizational communication mentioned above. Indeed, Idris and Dollard (2011) indicate that “communication systems will be in place so that risks can be identified and managed, for example through better allocation of workload or by providing greater

opportunity for recovery” (Idris and Dollard, 2011, p. 327). As a result, employees who feel psychologically safe should feel that they could discuss and question current practices with managers and supervisors and come up with provocative or innovative ideas for problem solving (Halbesleben and Rathert, 2008). Likewise, when employees perceive that their leaders are concerned by safety and security, they are more likely to take on security issues and to report errors (Halbesleben *et al.*, 2013). Such a psychological safety climate can result in less workarounds (Halbesleben and Rathert, 2008).

3.2 PSC and burnout

According to Hobfoll (2001), high levels of job demands or fewer resources can make workers suffer from stress or burnout. Hobfoll (1998, p. 81) explains the spiral of loss of resources by saying that “those who lack resources are not only vulnerable to the loss of resources, but the initial loss results in future losses.” This is consistent with the model of Bakker and Demerouti (2007) who argue that individuals with less resources and more job demands face more stress and burnout while those with greater access to workplace resources gain additional job-related psychological resources (cf. Bakker and Demerouti, 2007) that buffer stressors or high demands.

In addition, Dollard and Bakker (2010) proposed the PSC, as an extension of the JD-R model (Bakker and Demerouti, 2007) and proposed PSC as an antecedent of working conditions, defined as job demands and job resources (Bakker and Demerouti, 2007). They showed that it plays an important role in the motivational pathway of the JD-R theory as a beneficial resource at individual, team and organizational levels. Indeed, if the organization provides a stimulating and supportive environment via a good PSC, resources are likely to be sufficient and it will lead to not only decreasing job demands and burnout (Idris *et al.*, 2011), but also to increasing work engagement and better performance of health workers (Bakker *et al.*, 2011). We therefore expect PSC to be related to burnout.

3.3 Burnout and workarounds

When employees in the hospitality industry face a heavy workload, and less resources (e.g. social support), they tend to lose precious resources (energy, time and emotions), experience stress (Mansour and Commeyras, 2015), and increase burnout and intention to leave (Mansour and Tremblay, 2016). Likewise, the nursing profession is characterized by a high level of demands, including cognitive (e.g. interpreting data to recognize ominous patterns, reasoning and discretionary decision making), physical (e.g. tests and physical and respiratory therapy, bathing and moving patients to prevent bed sores) and emotional (educating patients – and their families – about their medical conditions). These demands usually concern many patients, which make meeting all of their needs “challenging, if not impossible” (Tucker and Edmondson, 2003). One would thus expect these demands to lead to different facets of burnout, for instance of physical, emotional or cognitive nature, as mentioned above. Moreover, Tucker (2004) indicated that nurses spent at least 33 min of their 7.5-h shift on problem solving and dealing with operational failures. She claims that this time leads to an additional workload and takes away time from valuable patient care, increasing both patient mortality and workers’ risk of burnout (Tucker, 2004).

Furthermore, Hobfoll (2001) indicated that those with fewer resources are less likely to invest more resources, which can lead to further resource losses. This creates a loss spiral, prompting individuals to adopt a defensive strategy with their remaining resources. In other words, in an environment of threatened resources, such as low levels of PSC, individuals try to minimize the loss of resources by selecting coping strategies that help them maintain their scarce resources (Wright and Hobfoll, 2004). Such a strategy consists of either adopting the easiest manner to perform the task or choosing a task that may require fewer resources (Halbesleben and Bowler, 2007). Lawton (1998) indicated that workers perceive

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workarounds as a way to save time, energy or effort. Indeed, workarounds require fewer resources than following rigid work instructions. Therefore, one would expect that nurses working in an environment with fewer resources at work (if PSC is low) will continually assess what needs to be done and redefine their tasks accordingly to meet the changing needs of patients (Tucker and Edmondson, 2003). In other words, they would engage more frequently in workaround behaviors (Halbesleben and Bellairs, 2015; Halbesleben *et al.*, 2012). When employees experiencing burnout have to decide between, on the one hand, following strict safety rules put in place to protect them and their patients, or, on the other hand, working around those rules to get the work done, they will be more likely to adopt workaround behaviors. This is even the case if these behaviors represent a higher risk because such behaviors require less effort and time (Halbesleben, 2010). Consequently, more burnout will lead to more workarounds.

We thus expect that in organizations where the level of PSC is high, employees should experience less burnout (physical fatigue, cognitive weariness and emotional exhaustion) and in turn, will be less likely to use workarounds. On the contrary, in organizations where the level of PSC is low, we would expect employees to experience more burnout, resulting in greater workaround behaviors. The following hypotheses are proposed (Figure 1):

- H1.* High PSC will decrease workarounds via decreasing physical fatigue as a mediator.
- H2.* High PSC will decrease workarounds via decreasing cognitive weariness as a mediator.
- H3.* High PSC will decrease workarounds via decreasing emotional exhaustion as a mediator.

4. Method

4.1 Sample and procedure

The study was conducted in the health sector in the province of Quebec (Canada), and the respondents are a strong majority of nurses. The study was conducted in partnership with the main union of nurses, the FIQ (Interprofessional Federation of Health of Quebec). Respondents were solicited via the union, both by sending newsletters and circulation of leaflets giving the website address for the survey; 562 responses were collected. The survey was sent to all members of the FIQ, but all do not open the newsletters, which makes it impossible to calculate a response rate.

The survey covers a majority of nurses (68 percent) but also other health personnel (nursing assistants (19 percent), respiratory therapists (8 percent) and others (5 percent) in

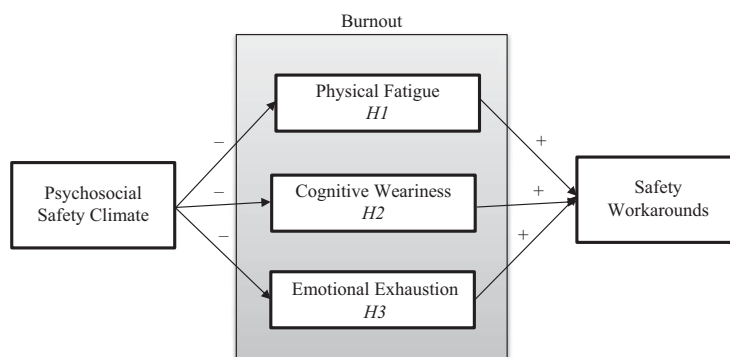


Figure 1.
Conceptual model

Quebec). Concerning the age of respondents, 164 are between 20 and 30 years; 230 between 31 and 40 years; 94 between 41 and 50; 70 between 51 and 60; and 4 are over 61 years. As for the number of years of experience, 169 have between 0 and 5 years of experience; 155 between 6 and 10; 103 between 11 and 15; 42 between 16 and 20; and 93 have over 21 years of experience. The composite score of each variable was calculated by using the mean. Means, standard deviation and correlations are presented in Table I.

The method of multiple imputation method (MICE) was used to handle missing data in our study. Indeed, research shows that the multiple imputation method is the best choice when missing data rates are above 10 percent and even around 5 percent (Wulff and Ejlskov, 2017). Our data contained a low percentage of missing data as reported in Table II. This method replaces each missing value with multiple plausible values (Harel and Zhou, 2007). However, the MICE imputation procedure implies that the variables used in the missing data are missing randomly (missing at random (MAR)), which means that the probability that a value is missing depends only on observed variables and not on unobserved variable (Schafer and Graham, 2002). We carried out Little's MCAR test to determine if missing data were MAR, completely at random (MCAR), or not at random (MNAR). The result showed that this test was significant, meaning that missing data were MAR. The condition to use the MICE imputation procedure was thus justified. We thus performed five imputations, according to prior research indicating that five to ten imputed data sets are sufficient (Azur *et al.*, 2011).

4.2 Measures

4.2.1 PSC. Two approaches have generally been used to try to explain and measure the organizational climate: the cognitive schema approach and the shared perceptions approach (Anderson and West, 1998). While some researchers consider that the work climate is a phenomenon shared by members of a group as a characteristic of the working group or organization (Schneider *et al.*, 1998; Zohar and Luria, 2005), others believe that the climate can be measured by the perceptions of individuals, or their cognitive patterns, relative to their work environment (Jones and James, 1979). In the first approach, to have a shared perception, the data are usually aggregated from many employees in one group or in a given organization. In the second approach, individual perceptions of the climate are used (Neal and Griffin, 2006). In this research, the second approach to PSC was chosen. This research evaluates the perception of each employee as concerns PSC in the organization.

It should be noted that most previous research has tested this scale within a team. As questionnaires were sent online via a hyperlink on the website of the FIQ, we were unable to identify the place of work for each worker, so that it was impossible for us to aggregate the data collected at the team level. However, it can also be applied at the individual level (i.e. without aggregation – cf. Kuenzi and Schminke, 2009). This method does not require sampling of workers within the same work unit. We thus tested PSC at the individual level in this study. This allows researchers to capture the perceptions of the

Variables	Mean	SD	1	2	3	4	5
1. PSC	2.28	0.8	0.9				
2. Physical fatigue	4.24	1.19	−0.42**	0.86			
3. Cognitive weariness	3.34	1.16	−0.33**	0.73**	0.9		
4. Emotional exhaustion	2.72	1.1	−0.24**	0.42**	0.51**	0.8	
6. Workarounds	2.65	1.06	−0.29**	0.23**	0.32**	0.35**	0.75

Notes: SD, Standard deviation. α estimates are on the diagonal. ** $p < 0.01$

Table I.
Means, standard
deviation and
correlations

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	<i>n</i>	Missing data	
		Effective	Percentage
MC1 In my workplace senior management acts quickly to correct problems/issues that affect employees' psychological health	558	4	0.7
MC2 Senior management show support for stress prevention through involvement and commitment	559	3	0.5
MC3 Senior management show support for stress prevention through involvement and commitment	559	3	0.5
MP1 Psychological well-being of staff is a priority for this organization	560	3	0.5
MP2 Senior management clearly considers the psychological health of employees to be of great importance	559	3	0.5
MP3 Senior management considers employee psychological health to be as important as productivity	559	3	0.5
OC1 There is good communication here about issues affecting my psychological safety	559	3	0.5
OC2 Information about workplace psychological well-being is always brought to my attention by my manager	558	4	0.7
OC3 My contributions to resolving occupational health and safety concerns in the organization are taken into consideration	561	3	0.5
OP1 Participation and consultation in psychological health and safety occurs with the unions and employees' representatives	558	6	0.11
OP2 Employees are encouraged to become involved in psychological health and safety matters	560	3	0.5
OP3 In my organization, the prevention of stress involves all levels of the organization	561	3	0.5
PHF1 I feel tired	562	0	0.0
PHF2 I have no energy for going to work in the morning	561	3	0.5
PHF3 I feel physically drained	562	0	0.0
PHF4 I feel fed up	562	0	0.0
PHF5 I feel like my "batteries" are "dead"	562	0	0.0
PHF6 I feel burned out	561	3	0.5
CW1 My thinking process is slow	561	3	0.5
CW2 I have difficulty concentrating	561	4	0.7
CW3 I feel I'm not thinking clearly	561	5	0.9
CW4 I feel I'm not focused in my thinking	560	3	0.5
CV5 I have difficulty thinking about complex things	561	3	0.5
EE1 I feel I am unable to be sensitive to the needs of coworkers and patients	562	0	0.0
EE2 I feel I am not capable of investing emotionally in coworkers and patients	560	3	0.5
EE3 I feel I am not capable of being sympathetic to co-workers and patients	562	0	0.0
WOAR1 I Bypass the organization's safety rules in order to get work done	561	4	0.7
WOAR2 Many people circumvent instructions when it limits their effectiveness	560	3	0.5
WOAR3 Sometimes I do not respect the expected way of working because it seems to be not effective enough	561	5	0.9
WOAR4 I follow safety procedures, even if it causes my work to take longer	560	4	0.7
WOAR5 I alter my work processes to bypass a safety procedure because the procedure slows me down	561	3	0.5
Notes: MC, Management commitment; MP, management priority; OC, organizational communication; OP, organizational participation; PHF, physical fatigue; CW, cognitive weariness; EE, emotional exhaustion; WOAR, workarounds			

Table II.
Missing data

individual in regard to the psychological impact of the work environment on his or her own well-being (Garrick *et al.*, 2014).

The PSC scale (12 items) established by Hall *et al.* (2010) was used to measure the PSC. This scale consists of four dimensions: management commitment (e.g. senior management acts decisively when a concern over an employees' psychological status is raised);

organizational communication (e.g. information about workplace psychological well-being is always brought to my attention by my manager); management priorities (e.g. psychological well-being of staff is a priority for this institution); and organizational participation (e.g. my contributions to resolving occupational health and safety concerns in the organization are taken into consideration). Items were rated on a five-point scale, going from 1 = strongly disagree to 5 = strongly agree.

4.2.2 Burnout. As the healthcare context is characterized by physical, emotional and cognitive demands, we used the Shirom Melamed Burnout Measure to measure burnout in our study, as it can cover all facets of burnout, which can lead to different types of workarounds. In addition, many studies conducted over the past ten years, in different samples and occupations, have supported and confirmed the three-factor structure (Bilgel *et al.*, 2012; Melamed *et al.*, 2009; Toker and Biron, 2012). Thus, we chose this measure in our study. This scale takes the form of a self-administered questionnaire with three dimensions (emotional exhaustion (three items), physical fatigue (six items) and cognitive weariness (five items)) and evaluated on a frequency scale of 1 (never) to 7 (always).

4.2.3 Workarounds. The construct of workarounds was tested by five items from Halbesleben and Rathert (2008) (e.g. I have altered my work processes because rules or policies keep me from doing my job efficiently). This scale was used and supported by Rathert *et al.* (2012), it showed an $\alpha = 0.69$. Items were scored on a seven-point frequency scale from 1 (never) to 7 (everyday).

4.3 Measurement model

In order to confirm the structure of constructs and the reliability and validity of the measurement scales, confirmatory factor analyses were carried out by the method of maximum likelihood, given the reflective nature of our construct and the size of our sample. To evaluate the quality of adjustment of scales for the data, indexes such as CFI, TLI, SRMR, RMSEA, and χ^2/df were retained. For CFI and TLI, a value of ≥ 0.95 is presently recognized as indicative of good fit (Hu and Bentler, 1999; Hooper *et al.*, 2008). For RMSEA, a value less than 0.07 is recommended (Steiger, 2007). SRMR less than 0.08 is acceptable (Hu and Bentler, 1999). As for χ^2/df , an acceptable cut-off is from 5 to 2 (Hooper *et al.*, 2008).

The results indicate that the quality of the model is good. Indeed, the values of the adjustment indices attest to the good fit of the theoretical model proposed for the data collected. These indices are considered satisfactory. Indeed, the $\chi^2/df = 2.45$, $p < 0.001$, CFI = 0.96, TLI = 0.95, SRMR = 0.043 and RMSEA = 0.05. Statistical analysis to test model fit, reliability and validity was carried out with the AMOS software, version 24.

To assess convergent validity, the average variance extracted (AVE) for each construct was calculated; values above 0.5 mean a good convergent validity (Fornell and Larcker, 1981). Discriminant validity was established where maximum shared variance (MSV) was lower than the AVE for all the constructs (Hair *et al.*, 2010). The results of these analyses are presented in Table III.

Variables	CR	AVE	MSV
1. PSC	0.95	0.84	0.18
2. Physical fatigue	0.95	0.74	0.55
3. Cognitive weariness	0.95	0.80	0.55
4. Emotional exhaustion	0.85	0.66	0.26
6. Workarounds	0.86	0.56	0.12

Notes: CR (Composite reliability) = Reliability; AVE (Average variance extracted) = Convergent validity; MSV (Maximum shared variance) = Discriminant validity

Table III.
Reliability,
convergent and
discriminant reliability

PR

The reliability analysis presented in Table III shows that all variables have good reliability (CR between 0.86 and 0.95). Convergent validity (AVE) varies between 0.56 and 0.84, which is very satisfying. Discriminant validity is confirmed, as the variance of the latent variables is greater than the square of the correlation between the latent variables. In other words, AVE is larger than MSV for all constructs.

4.4 Common method variance (CMV)

As our study looked at perceptions of employees of many behavioral variables measured at one point in time and responses thus were self-reported, there might be a bias of the CMV. Podsakoff *et al.* (2003) have suggested four preventive methods to diminish the CMV bias, including: adding reverse items in the survey; randomly organizing items; concealing the purpose of the research; and concealing the relationship between questions. Our questionnaire was formulated on the basis of these suggestions in order to reduce this concern. Also, the assurance of anonymity and confidentiality was provided (Podsakoff *et al.*, 2012). In addition, Chang *et al.* (2010) recommended some statistical tests to address the issue of CMB. First, using Harman's one-factor test (Podsakoff and Organ, 1986), all items related to PSC, burnout and safety workarounds that were subjected to an exploratory factor analysis clearly revealed that common method bias was not a major issue, as the test reveals that the newly introduced common latent factor explains 36 percent of the variance which is less than 50 percent (Podsakoff *et al.*, 2003). Second, we employed CFA to further test the effect of CMV (Stam and Elfring, 2008). The three-factor model involving our three variables demonstrated fairly good fit to the data comparing with one factor: $\chi^2/\text{df} = 17.76$, $p < 0.001$, CFI = 0.47, TLI = 0.43, SRMR = 0.24 and RMSEA = 0.17. We also compared our theoretical model with another model where workarounds were considered as a mediator between PSC and burnout. The results indicate that our model fit the data better as $\chi^2/\text{df} = 3.73$, $p < 0.001$, CFI = 0.91, TLI = 0.90, SRMR = 0.09 and RMSEA = 0.08. Third, we controlled for an unmeasured latent method factor and allowed all self-reported items to load both on their theoretical constructs and on the method factor (Podsakoff *et al.*, 2003). The results for all structural path parameters remained the same after our controlling for the method factor, suggesting that CMV did not bias our findings (Yuan and Woodman, 2010).

4.5 Structural model

4.5.1 Standardized direct effects. We used AMOS software to test the direct effects in our model, which does not include a direct hypothesizes, but we did this test to provide a full picture of results. Results presented in Table IV attest to the good fit of the theoretical model proposed: $\chi^2/\text{df} = 2.71$ (1,137.853/ 420; $p < 0.001$), CFI = 0.95, NFI = 0.92, TLI = 0.94, SRMR = 0.07 and RMSEA = 0.055. The results of SEM in Table IV show that the standardized direct effects of the independent variable (PSC) on the three variables of burnout (physical fatigue, cognitive weariness and emotional exhaustion) are negative and significant ($\beta = -0.45$, $p < 0.001$; $\beta = -0.34$, $p < 0.001$ and $\beta = -0.25$, $p < 0.001$, respectively). This means that PSC is negatively related to all dimensions of burnout. Also, the results show that standardized direct effects of these dimensions (physical fatigue,

Table IV.
Results of
standardized
direct effects

Variable	Physical fatigue		Cognitive weariness		Emotional exhaustion		Workarounds	
	β	CR	β	CR	β	CR	β	CR
PSC	-0.45***	-9.38	-0.34***	-7.5	-0.25***	-5.15	-0.24***	-4.66
Physical fatigue							0.15*	2.06
Cognitive weariness							0.25***	3.66
Emotional exhaustion							0.23***	4.79

Notes: The direct effect of PSC on workarounds before introducing mediators. * $p < 0.05$; *** $p < 0.001$

cognitive weariness and emotional exhaustion) on workarounds are positive and significant ($\beta = 0.15, p < 0.05$; $\beta = 0.25, p < 0.001$ and $\beta = 0.23, p < 0.001$, respectively), meaning that burnout is positively related to safety workarounds. As for the relationship between PSC and workarounds, results reveal that this relationship is negative and significant ($\beta = -0.24$), meaning that PSC is negatively related to workarounds.

4.5.2 Mediating analysis. The analysis of mediating effects was performed using Hayes's (2013) PROCESS macro. The approach of Hayes is based on a bootstrap analysis (Preacher and Hayes, 2004). This overcomes the limits of the approach of Baron and Kenny (1986), traditionally used in the analysis of mediation, in particular the statistical power problem (Edwards and Lambert, 2007), and the decrease in type I error (Preacher and Hayes, 2008). Moreover, this method allows the test of multiple mediators simultaneously and does not rely on the assumption of a normal sampling distribution (Cohen and Abedallah, 2015). In our analysis, 95 percent confidence intervals and 5,000 bootstrapping re-samples were run. SPSS v.22 was used to do this analysis. The results are shown in Table V.

The results show that all unstandardized indirect effects are significant, and therefore, all hypotheses regarding mediating effects of burnout between PSC and workarounds are maintained. Specifically, the results of bootstrap indicate that the indirect impact of PSC on workarounds through physical fatigue is negative and significant ($\beta = 0.06, SE = 0.04, 95\% CI = [-0.14, -0.01]$). These results suggest that *H1* is supported; PSC decreases workarounds by decreasing physical fatigue. The results also reveal that the indirect influence of PSC on workarounds via cognitive weariness is negative and significant ($\beta = -0.09, SE = 0.03, 95\% CI = [-0.16, -0.03]$). *H2* is thus maintained; PSC decreases workarounds by decreasing cognitive weariness. In addition, results show that the indirect effect of PSC on workarounds through emotional exhaustion is negative and significant ($\beta = -0.07, SE = 0.02, 95\% CI = [-0.11, -0.04]$). *H3* is therefore validated; PSC decreases workarounds by decreasing emotional exhaustion. In sum, results show that total effect of PSC on workarounds via burnout is negative and significant ($\beta = -0.09, SE = 0.03, 95\% CI = [-0.16, -0.03]$).

5. Discussion

There are several key findings from this study. Importantly, physical fatigue, cognitive weariness and emotional exhaustion were found to mediate relationships between PSC and workarounds. While previous research had examined the mediating role of emotional exhaustion between some work environment characteristics such as time pressure, autonomy, teamwork and workarounds (Rathert *et al.*, 2012), this study extends previous research because it puts the accent on other dimensions of burnout such as physical fatigue and cognitive weariness, which are often very important in the context of hospital work. Moreover, we examine the effect of PSC on workarounds through these three dimensions of burnout.

Variables	Estimate	Boot SE	Bootstrapping percentile 95% CI	
			Lower	Upper
Physical fatigue as mediator (M1) between PSC (Independent) and workarounds (Dependant)	-0.06	0.04	-0.14	-0.01
Cognitive weariness as mediator (M2) between PSC and workarounds	-0.09	0.03	-0.16	-0.03
Emotional exhaustion as mediator (M3) between PSC and workarounds	-0.07	0.02	-0.11	-0.04
Total	-0.09	0.03	-0.16	-0.03

Notes: M1 = mediator 1; M2 = mediator 2; M3 = mediator 3. 5,000 bootstrap samples; 95% confidence intervals

Table V.
Results of bootstrap
for unstandardized
indirect effects

To our knowledge, this is the first study which tests these relationships. Thus, evidence that PSC affects workarounds through physical fatigue, cognitive weariness and emotional exhaustion is an important contribution, considering the impact of workarounds on patient safety and injuries (Halbesleben, 2010). As little is known about nursing practice of workaround behaviors, our findings can therefore provide empirical evidence on additional underlying sources for workarounds instead of only documenting them, which advances the knowledge on this topic and encourages other researchers to further explore this domain. Indeed, clinicians are more likely to use workarounds when resources have been further depleted with fewer available for investment in prescribed work processes (Halbesleben and Bellairs, 2015). In addition, Wheeler *et al.* (2012) suggest that inadequate or insufficient resources can lead to less motivated and disengaged employees, higher intention to leave the organization, less energy to follow hospital rules and greater likeliness to practice workarounds to make work easier. On the contrary, when individuals have more resources, they are more protected against loss and more inclined to invest in resources (Hobfoll, 1989). In our study, we consider PSC as a resource passageway or organizational tool, which allows employees to gain more resources or to protect themselves from the loss resulting from burnout. In other words, when employees perceive that organizations, managers, supervisors or assistant head nurses offer policies, procedures and practices to identify and resolve problems that threaten their well-being and psychological safety, they feel that they have more stable and safer working conditions (Idris *et al.*, 2011). This can lead to more work engagement (Bakker *et al.*, 2011) and decreased likeliness that employees will use workarounds. Our study adds to the literature by suggesting that PSC may decrease the intention of employees to practice workarounds through the decrease in the level of burnout. As little is known or understood about nursing practice and the use of workarounds, researchers have called for empirical studies with a primary focus on workarounds instead of documenting potential causes or effects of these unsafe behaviors (Debono *et al.*, 2013; Rathert *et al.*, 2012; Halbesleben, 2010). This study therefore provides empirical evidence and finds additional underlying sources on how to deal with workarounds. Other studies have found support for PSC among Malaysian (Idris and Dollard, 2011; Idris *et al.*, 2011, 2012) and Australian workers (Idris *et al.*, 2012; Law *et al.*, 2011). Our study supports the observation that there is an impact of PSC on workarounds via burnout among Canadian workers in the health sector.

6. Practical implications

The results of this study show that patricians in health care can be brought to work around policies, practices and procedures implemented by the organization to protect the safety of patients and workers. As our research was done in health care organizations in the Canadian province of Québec, these results are very important in terms of practical implications. As in many other countries, the evolution of health expenditures is an issue politicians and health managers have had to deal with in recent decades, due to the importance of these expenditures in the national budget. In Quebec, public spending on health is estimated at over 40 percent of total public expenditure of the Government of Quebec. Cuts in health care in recent decades as well as early retirement programs and hiring freezes imposed by governments have reduced the number of nurses and other health professionals, resulting in an intensification of work and organizational challenges (Tremblay, 2014). As the population ages and requires more services, it appears that the nursing personnel has not increased enough. Nurses and health professionals are also aging, which is another challenge for the health sector. The COR theory suggests that intangible resources are as important for employees as tangible resources, and such resources may not cost that much to the organizations (Rathert *et al.*, 2012), especially given the benefits they might bring.

It seems that workload pressures can make workaround behaviors subconscious actions that constitute survival mechanisms for nursing and other health care professionals. Research shows

that work system failures increase nurses' workload from five patients to 5.3 patients, contributing to nurses' burnout and potentially increasing patient mortality by 2 percent (Aiken *et al.*, 2002). Tucker (2004) indicated that nurses take valuable time away from patient care – an average of 33 min per nurse per 7.5-h shift, to deal with operational failures, rules and obstacles in workflow. Morath and Turnbull (2005) question the health care workaround culture that essentially masks work system problems, given that frontline health care professionals work around them. They advance the idea that health care has a workaround culture that values expertise in bypassing obstacles in order to get the job done (Morath and Turnbull, 2005).

Health care organizations should change this culture and create a culture or climate where more resources are provided to nurses and other professionals to enable them to better manage their workload, one of the most important sources of both burnout and workarounds. Indeed, nurses or front-line workers are the first to have knowledge and experience of potential obstacles in work processes. In this way, they are able to identify the failures that may lead to poor performance of work systems, and eventually, to workarounds. Organizations should ensure a good system of communication and trust at all levels in order to access information on the reality of work practices. Indeed, managers and supervisors at the level of the work unit could encourage workers to talk about their difficulties at work. Such discussions with staff could include the issue of workarounds and the blockages or obstacles in workflow, which could help policy-makers find appropriate solutions. This also could lead to implementing best practices that prevent the development of common workarounds. Moreover, when senior managers value employees' psychosocial well-being and act quickly to correct problems affecting it, employees feel more psychologically safe (Hall *et al.*, 2010). This support can make workers more resourceful and therefore more capable of doing tasks or attaining goals successfully because they consider that their leaders value their contribution and participation in decision making related to work processes. Workers therefore feel more creative in their problem-solving efforts (Nembhard and Edmondson, 2006), which could make them less likely to use workarounds or translate the possible negative effects of workarounds into positive contributions. Moreover, information and education sessions at the workplace could help employees understand the negative as well as positive effects of workarounds for patient health and quality of care. This could be very important considering the fact that nurses sometimes work around rules that they do not fully understand or that they believe are unnecessary (Baeyer and Pasero, 2016). In addition, our study demonstrates that when workers perceive that the organization offers more resources (via policies and practices supporting their well-being), they become less stressed and more engaged. This is a very interesting result for the leaders of health care organizations, wherein questions of the motivation, engagement, attraction and retention of nurses constitute very important issues. Offering the resources mentioned above could help these organizations retain nurses already working there through enhanced engagement at work, which could lead to better performance. This is an important challenge in the public health sector, which sees many nurses leaving for the private sector in order to have access to better working conditions and schedules.

7. Limitations and future research

The current study has some limitations that need to be mentioned. The first limit is related to the cross-sectional nature of the study, which limits the possibility to draw causality between variables. The use of data collected at two or three-time periods, along with the use of multi-source data (such as observational methods to capture the frequency of workarounds) could help to reduce concerns about common method bias. Future research may consider the use of other methods and sources of data to expand our understanding of workarounds. To thoroughly explore and identify the nature, antecedents and consequences of workarounds, researchers should interview nurses on a confidential and interactive basis. Practitioners are putting themselves and patient's safety at risk when using a workaround, which may lead to occupational injury (Wheeler *et al.*, 2012; Rathert *et al.*, 2012; Halbesleben, 2010). In depth

interviews and qualitative studies could further explore the thought processes, feelings and considerations underpinning the decision by workers to take risks by practicing workarounds.

Another limitation is related to the fact that we tested PSC at the individual level. While PSC “theory is consistent with evidence suggesting that individually focused approaches are effective at the individual level” (Zadow and Dollard, 2015, p. 424), combining both individual and organizational approaches provides better insight on how the intervention on stress and working condition can be done (Zadow and Dollard, 2015). It thus seems that PSC could have more impact if it was measured at the unit/organizational level.

Also, we tested in our study the mediating role of burnout between PSC and safety workarounds. It would be interesting to verify the effect of PSC on workarounds via engagement, for example. Indeed, some researchers have tested the relationship between PSC and work engagement via work resources (e.g. Dollard and Bakker, 2010, Idris and Dollard, 2011, Law *et al.*, 2011, Garrick *et al.*, 2014, Idris *et al.*, 2015). Engaged employees should more readily invest in resources because they hope to have future resource gains (Hobfoll, 2001), resulting in less likelihood of using workarounds (Halbesleben and Rathert 2008). According to these authors, “when employees are engaged, they should be more vigilant of the processes necessary for improving the quality of their work, they should feel that they can put forth the effort required to make changes in faulty work processes without retribution, as opposed to continually participating in workarounds simply to get the job done” (p. 137).

Finally, it would be interesting to investigate if senior managers in the healthcare industry wish to encourage workarounds, as this may lead to possible efficiency and effectiveness gains. Future research could explore such questions related to organizational culture.

8. Conclusion

Workarounds are a relatively new subject in research literature, and not yet a clearly indexed concept in academic databases (Debono *et al.*, 2013). It is crucial to understand how to avoid a situation where a change aimed at improving quality of care and patients’ health results in unnecessary work process blockages and workarounds (Rathert *et al.*, 2012). This is particularly important given the changing environment and organizational reforms characteristic of today’s health care system in many countries. This research, combined with a few others conducted to this day, could be a step toward a better understanding of this construct of workarounds. Understanding the relations between hospitals’ attempts to standardize the quality of care and patient safety as well as employees’ responses to these challenges is important for the human resource management functions within the hospital (Wheeler *et al.*, 2012). This is a huge challenge in the present context of reduced public health spending and organizational reforms in today’s health care systems in many countries, considering the important impacts and risks our research has highlighted.

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