The Mediation Effect of Organizational Climate on the Relationship between HPWS and Perception of Patient Safety

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Abstract

The main aim of this paper is to investigate the mediation effect of organizational climate on the relationship between HPWS and perception of patient safety in Saudi Hospitals. Patient safety has become a significant topic among health professionals, policy makers, and the public owing to the emphasis on the reported and unreported healthcare errors that result in negative situations. A quantitative research design was adopted to collect data. Out of 254 questionnaires returned which are content to 202 questionnaires returned from 112 general hospitals and 52 from 33 specialist hospitals only 217 questionnaires used for analysis. The Partial Least Squares Structural Equation Modeling (PLS-SEM) method was used to conduct this study. The findings of the study will contribute to both theory and practice. The results of this study have important contributions and implications for practitioners and policy-makers. This study contributed to the field of organizational climate on patient safety in Saudi Hospitals. It is contended that organizational climate was found to play a pivotal role in the model, as it had a direct significant impact on patient safety and frequency of occurrence of adverse events, and had a partial mediating effect on the relationship between HPWS and patient safety.

Keywords: organizational climate, patient safety, high performance, Saudi hospital

1. Introduction

Patient safety has become a significant topic among health professionals, policy makers, and the public owing to the emphasis on the reported and unreported healthcare errors that result in negative situations. Several initiatives and studies dedicated to patient safety have been conducted in the Western countries that are characterized by well-organized healthcare systems and effectively implemented quality assurance programs (Al Rifai, 2008). In contrast, developing countries lack the infrastructure required for the implementation and lack resources to tackle patient safety. On the basis of the report of the World Health Organization (WHO, 2004), deficiencies in healthcare systems in terms of infrastructure, lack of skilled personnel and other quality issues are still prevalent in the developing countries.

Patient safety is comprised of indicators including various items in literature and among the top of them are patient mortality, failure-to-rescue (Aiken et al., 2003), pneumonia, pressure ulcers, erroneous medication, patients' accidental falls, and infections (Penoyer, 2010).

In an attempt to describe the potential factors affecting patient safety, it was stated that adverse events do not occur intentionally from people to hurt patients but they are attributed from the complex healthcare systems which influences the performance of the individuals (WHO, 2009). The ability of the employees to perform hinges upon a set of combined factors in a way that possessing greater abilities, being highly motivated and steering clear of external disruptions negatively impacting the employees work eventually results in better performance (Spaulding, 2011).

Consequently, policy makers in healthcare increasingly recognize that a well-motivated, appropriately skilled and deployed workforce is crucial for success of health system delivery (Buchan, 2004), managing this

workforce by means of human resource management (HRM) can be seen as an important key to success in hospitals. With the recent advances in human resource management, high performance work system (HPWS), which was introduced in the last few decades, is viewed as the use of mutually reinforcing HRM practices in a systematic way which stresses on the selection of suitable employees, development of their skills, organizing work so that employees have the discretion to solve problems creatively, and the use of reward systems which motivate employees to work effectively in pursuit of organizational goals (Harley et al., 2007).

Patient safety has become foremost critical issue in the last decade either in the developed countries or in the developing countries (Nygren et al., 2013). Despite of the growing global concern about patient safety accompanied by the recent advances in medical technologies and several researches' conceptualization of patient safety, the reports and statistics about patient safety are scarce even in developed countries (Shojania et al., 2001). The review of these scarce available statistics clearly points to critical level of patient safety worldwide, for example, the statistics published by the Committee on Quality of Health Care in America and Institute of Medicine (2000) revealed that the annual total deaths due to preventable medical errors in USA were estimated to exceed 44,000 patients. In light of this and other similar alarming statistics from other institutes (Jao & Hier, 2010), it was ascertained that medical errors not only threaten the quality of healthcare and increase healthcare costs, but it also adds to the medical malpractice crisis (Studdert et al., 2005).

Organizational climate refers to the acknowledged features of the organization and its sub-systems as reflected in its way of dealing with members, groups and issues (Asha, 2008). It is a set of measurable properties of the work environment, which are directly/indirectly perceived by the individuals at the workplace and assumed to affect their motivation and behavior (Litwin & Stringer, 1968). Asha (2008) claimed that organizational climate hinges on the perceptions of the employees, and reflects the manner to which employees acknowledge their work environment, which in turn affects their work-related attitudes and behaviors. Based on this definition, organizational climate may be described as the individual's attitude towards organizations (e.g., trust level, morale, conflict, rewards equity, leadership credibility, change resistance and scapegoating (Ngo et al., 2009).

Some researchers have nevertheless postulated that climate is an environmental attribute that is developed by the organization's objective characteristics like its structure context. For instance, according to Richers and Schneider (1990), climate consists of the organization's perceptions concerning rewards (formal or informal), policies, routines, practices and procedures. The description of climate as an objective attribute indicates that an outside person can measure the climate in the organization on the basis of its aspects. Based on this notion, individual perceptions of climate should be ignored and this goes against the traditional method of aggregating individual's perception to measure climate. If climate is an actual organizational characteristic, then totaling individual data to gauge climate may lose its appropriateness (Glick & Roberts, 1984).

The mediating effect of organizational climate on the relationship between HRM system strength and organizational performance was first proposed by Bowen and Ostroff (2004). Sanders et al. (2008) stated that a strong organizational climate was a term used by Bowen and Ostroff (2004) to refer to the climate strength and not its level. Climate level refers to the convergent perceptions ratings of particular work situation facet like safety, service, or HRM, and it is often measured by the mean of individual perception scores, whereas climate strength refers to the agreement level concerning the climate. Climate strength is measured via homogeneity statistics that relate to the aggregate members' perception like standard deviation and within-group correlations. Hence, climate strength more closely reflects Bowen and Ostroff's (2004) organizational climate concept as the shared perceptions of employees.

Finally, in the health care sector, the environment has bearing on outcomes such as patient safety (Ngo et al., 2009). The dynamic work environment is what forms the organizational climate of the health service organization and it forms a guideline upon which employees to understand organizational life in the health care organizations (Ngo et al., 2009). Thus, organizational climate can be deemed among the top mediating factors in patient safety (Walston et al., 2010). Such mediation arises via HRM. Although several aspects related to HRM can impact patient safety, the present study focuses on specific elements that impact nurses' practices in public hospitals and its effect on patient safety.

The objective of the study is to obtain the mediating effect of organizational climate on patient safety in Saudi public hospitals.

2. Literature Review and Hypotheses Development

2.1 Relationship between High Performance Work System and Organizational Climate

Schneider, White, and Paul (1998) were among the first to examine the relationship between HR practices and

shared perceptions among employees about the organizational climate in service business. They hypothesized that employees' perceptions about the concern of the organization in providing high level of service quality depend on their perceptions about climate-based aspects in HR practices, which involve encouragement of employees in sharing of making decisions in addition to appropriate training that supports and facilitates service delivery.

Accordingly, Whitener (2001) asserted that HR practices inherently influence employees' perceptions of a unit's level of support. Later, and based on the previous assumptions, researchers argued that HR practices play a key role in shaping employee climate perceptions about their work environment (Zacharatos et al., 2005). For example, Ostroff and Bowen (2000) considered HR practices an essential predictor of the interpretation of the employees about the strategic concern of the organization. Although earlier researches indicated that different climates can be initiated within the same organization as a result of implementing different strategic practices (Schneider, 1990), other studies indicated that apart from these variations, there are still shared perception among employees working in the same unit especially in climate of service organizations (Borucki & Burke, 1999) and safety climate (Hofmann & Stetzer, 1996). Based on above discussion, the following hypotheses are formulated:

Hypothesis 1: High performance work system (HPWS) is significantly related to organizational climate.

2.2 Relationship between Organizational Climate and Overall Perception of Patient Safety

Many scholars believe that organizational climate is a significant factor in ensuring patient safety in health care systems (Walston et al., 2008). Basically, climate is a term that indicates shared employee perceptions which directly influences health care professionals to choose proper behaviors that enhance patient safety (Walston et al., 2008). From this definition, it is clear that the concept of organizational climate in health care systems is intimately related to patient safety. Hence, there is a growing concern about the impact of certain aspects of organizational climate on work stress and subsequent adverse events (Clarke et al., 2002). For instance, Fogarty and McKeon (2006) tested a model with hypothesized links between organizational climate and unsafe medication administration among nurses in Australia. They found that the model provided a considerable fit to the data with organizational climate and its relationship with the magnitude of violations to instructions. They also observed that violation to instructions was the only variable that made a direct contribution to medication errors. Based on these findings, the hypothesizes are formulated:

Hypothesis 2a: Organizational climate has a significant positive effect on overall perception of patient safety.

Hypothesis 2b: Organizational climate has a significant negative effect on frequency of occurrence of adverse events.

2.3 Effect of Organizational Climate on High Performance Work System and Overall Perception of Patient Safety

The mechanisms describing this effect are mainly explained under social theories and factors such as social exchange and organizational climate, which impact employees' perceptions and behaviors (e.g., Collins & Smith, 2006). Nevertheless, such propositions are still lagging behind the empirical evidence (Aryee & Law, 2007). Takeuchi et al., (2009) studied the mediating role of organizational climate between HPWS and outcome at the employee level in terms of attitude and satisfaction. They found that climate mediated the cross-level relationships of HPWS with job satisfaction and affective commitment.

There is possibility for the existence of other mediators through which HPWS influences outcomes (Ployhart, 2004). For example, Messersmith et al., (2011) showed that the outcome, which is the end result of performance, was influenced by the level of satisfaction and attitude that shape organizational citizen behavior (OCB). These attitudes were created among the employees as a consequence of HPWS activities. Thus, the relationship between HPWS and outcome was mediated by OCB rather than organizational climate. Whether organizational climate can act as a mediating platform between HPWS and performance (patient safety, in the case of health care sector) remains largely an unanswered question. Therefore, and as a contribution, the following hypothesis is tested.

Hypothesis 3: Organizational climate mediates the relationship between high performance work system (HPWS) and overall perception of patient safety.

3. Research Method and Research Framework

3.1 Research Method

According to Vogus (2006), high performance work systems contribute to high quality outcomes for patients, particularly patient safety. He also argued that the impact of these high performance practices on patient safety

outcomes could be mediated by the interactions among the nursing staff on hospital units (Vogus, 2006). Meanwhile, Takeuchi et al. (2009) hypothesized that high performance work systems are linked to organizational climate. They claimed that HPWS, which is concerned with employees, concentrates on motivational or skill acquisition practices which are assumed to provide a sense that the organization cares about its employees'success and well-being.

Reports from the Institute of Medicine (IOM) emphasized that leadership is essential to achieving goals related to quality of care and patient safety. The impact of leadership is argued to be applicable to all levels of an organization including the executive managers to those working directly with patients (Page, 2004). Additionally, leadership, through its two-sided engagement between leaders and employees, helps to achieve a common goal (Northouse, 2012). It influences employees' behavior while simultaneously influencing their perceptions which ultimately lead to expectations of appropriate conduct that becomes incorporated into the organizational climate (Grojean et al., 2004). Within this complex interaction between various factors which affect patient safety, it is crucial for health care providers to consistently report events related to safety of the patients that are expected to empower a hospital's ability to learn from its experience (Tamuz et al., 2004). To encourage all staff to identify and report adverse incidents, it is necessary to raise awareness of employees about how to maintain safe environment for patients. In this context, the leaders are expected to play an important role in guiding and encouraging the staff to identify errors and adequately adhere to a transparent reporting system. To ensure success and continuity of this system, it should involve recognition of and rewarding the staff in return for their reporting (Coyle, 2005).

3.2 Research Framework

Figure 1 presents the overall representation of the theoretical framework that depicts the relationships between leadership, HPWS, organizational climate, effective reporting system and patient safety. Based on the fragmented empirical evidence, the current study suggests a coherent model investigating these relationships in a single model.
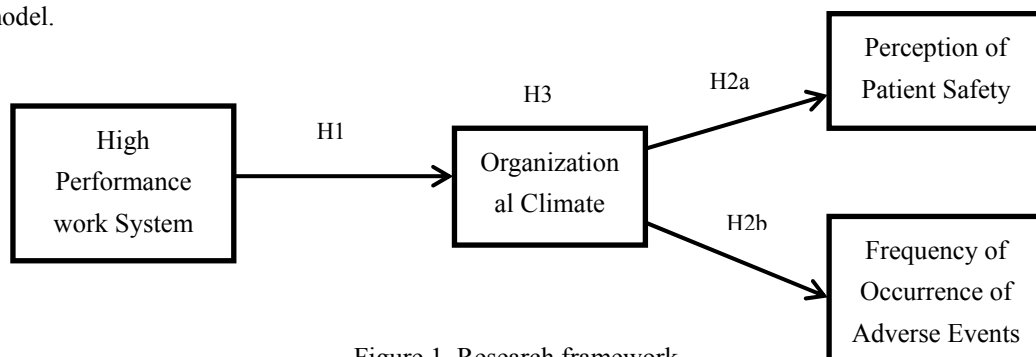

Figure 1. Research framework

4. Data Analysis and Results

4.1 Assumption of Normality

The normality used to indicate the symmetrical curve that has the greatest frequency of scores towards extremes in the small and middle frequencies. To do so, some researches such as Kline (1998) suggested assessing the normal distribution of scores for the independent and dependent variables through examining their skewness and kurtusis values. In social sciences, the nature of the constructs has many scales and measures may results skewed positively or negatively (Pallant, 2005). In addition, kurtusis is also a score for measuring distribution that represents the degree to which observations around the central mean are gathered.

According to Hair et al. (2006) the values of skewness outside the range of +1 to -1 are substantially skewed distribution. However, Kline (1998) suggested the cut off between +3 to -3 will be acceptable. Based on these criteria suggested by many researchers, the skewness values were within the acceptable range suggested by Kline (1998) (+3 to -3), however, not acceptable values according to Hair et al. (2006) (+1 to -1). Similarly, the values of kurtusis are suggested by Coakes and Steed (2003) to range from +3 to -3 which are acceptable based on the below Table 1.

Based on discussion above, the results show that some of values in skewness deviate from being normally distributed. Therefore, to be able to handle nor-normal and skewed data to test the hypothesized relationships, this study employed PLS Structural Equation Modeling that is the distribution free statistical modeling technique.

Table 1. Results of skweness and Kurtusis for normality test

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Recruitment/Hiring	-0.92	0.17	-0.53	0.33
Training	-1.33	0.17	0.88	0.33
Performance Appraisal	-0.70	0.17	-0.49	0.33
Job Security	0.24	0.17	-1.32	0.33
Idealized influence (attribute)	-1.37	0.17	0.63	0.33
Participation	-0.99	0.17	0.53	0.33
Idealized influence (behavior)	-0.62	0.17	0.21	0.33
Inspirational motivation	-1.00	0.17	2.00	0.33
Intellectual stimulation	-0.79	0.17	1.04	0.33
Individualized consideration.	-1.23	0.17	2.43	0.33
Effective Reporting system	-1.76	0.17	3.72	0.33
Organizational Climate	-0.27	0.17	-0.59	0.33
Occurrence Frequency of Adverse Events	0.46	0.17	1.13	0.33
Perception of Patient safety	-1.76	0.17	3.77	0.33

4.2 Goodness of Fit (GoF) of the Model

To support the validity of the PLS model, GoF value was estimated according to the Using the formula, the GoF value was 0.598 obtained.

$$GoF = \sqrt{\left(\overline{R^2} \times \overline{AVE}\right)}$$

(1)

Table 2. Goodness of fit of the model

Constructs	R square	AVE
Performance appraisal		0.71
Effective reporting system	0.72	0.70
High performance work system	0.59	
Individualized consideration		0.67
Idealized influence (attribute)		0.71
Idealized influence (behavior)		0.70
Inspirational motivation		0.79
Intellectual stimulation		0.75
Job security		0.93
Frequency of adverse events	0.12	0.59
Organizational climate	0.60	0.61
Perceived patient safety	0.40	0.68
Participation		0.75
Recruitment/hiring		0.82
Training		0.92
	0.48	0.74
Goodness of Fit (GoF)		0.60

A comparison was made with the baseline values of GoF (small = 0.1, medium = 0.25, large = 0.36). Table 2 shows that the model's goodness of fit measure was large, indicating an adequate level of global PLS model validity.

4.3 Mediation Effect Analysis

A mediating variable is the variable that mediates the effect from an independent variable to its dependent variable. If the direct effect from variable X, such as, high performance work system (HPWS) to variable Y, such as, perceived patient safety (PPS), does not exist, but instead the effect exists indirectly through another variable M, such as, organizational climate (OC), then in this case M is a mediating variable (Hair et al., 2010). The position of the mediation variable in the model illustrated below.

Independent Variables Mediating Variable Dependent Variable

(M) Organizational Climate

(X) High Performance work System

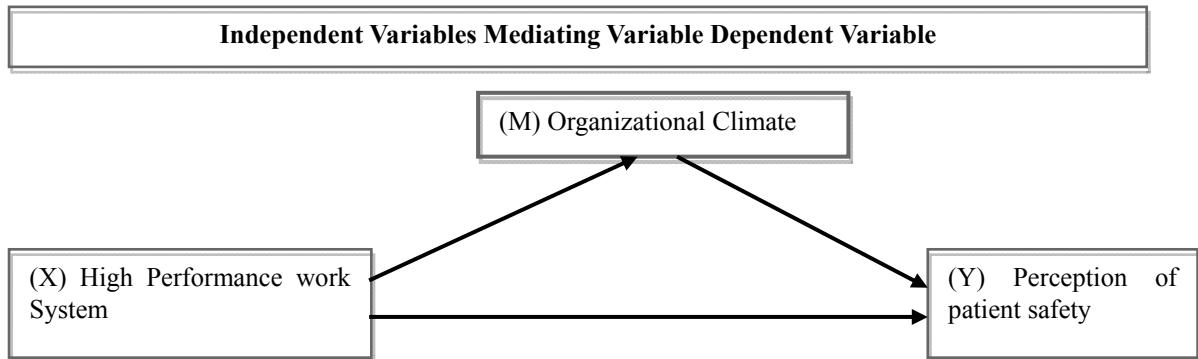(Y) Perception of patient safety

Figure 2. Mediation effect of organization climate

In this study, organizational climate was hypothesized as a mediating variable that mediates the relationship between high performance work system and perceived patient safety, as shown in Figure 3 and Figure 4. According to Baron and Kenny (1986), a mediator variable is a generative mechanism wherein the focal independent variable influences the dependent variable of interest. Mediation conveniently takes place where there is a significant relation between predictor and criterion variables. A mediator variable is considered as so if it develops an indirect effect through which the focal independent variable influences the criterion variable under study (Baron & Kenny, 1986). Moreover, the mediator variable is capable of transmitting some causal effects of previous variables on to the next ones. Furthermore, mediating variables have been playing a key role in both psychological theory and research. This type of variable enables the transmission of the antecedent variable's effect to the dependent variable and hence providing a clarification of the variables' relationships.
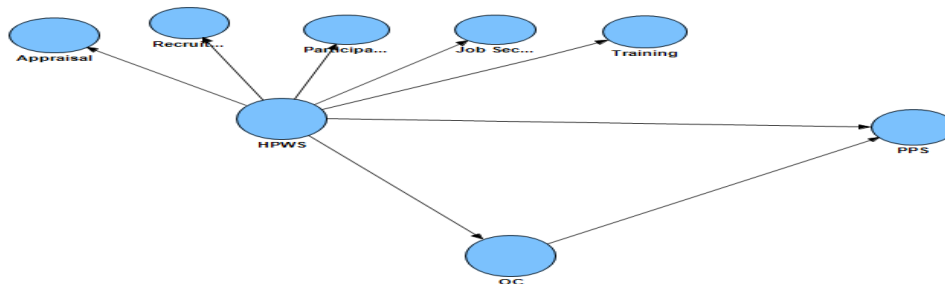
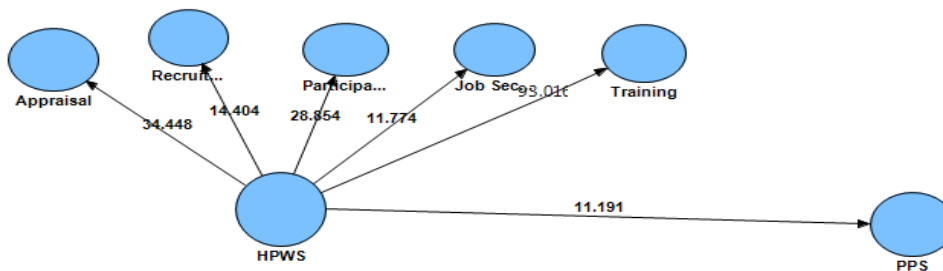Figure 3. Mediation effect of organization climate (H_{12})

Figure 4. Mediation effect of organization climate (direct relationship [C])

Several methods have been used for the assessment of mediation in various researches in the past twenty years. A mediation analysis provides the identification of basic processes that underlie human behavior and that are significant throughout behaviors and contexts. To test the mediation of M, four conditions must be met: (a) X (predictor) is significantly associated with Y; (b) X (predictor) is significantly associated with M; (c) M is significantly associated with Y (after controlling for X); and (d) the impact of X on Y is significantly less after controlling for M.

5. Discussions

5.1 High Performance Work System and Organizational Climate

We also found that high performance work system had a significantly positive impact on organizational climate. A similar result was reported by Li et al., (2011). Takeuchi, Chen, and Lepak (2009) also observed a similar finding among 324 managers and 522 employees in Japanese establishment.

Transformational Leadership theory is covering most of the favorable characteristics of organizational climate. In its essence, the transformational leadership includes Idealized Influence which includes instillation of pride, faith and motivations among followers; Idealized Influence which includes sharing of values and beliefs in addition to encouraging autonomy; Inspirational Motivation which encompasses creation of optimistic attitude and supporting challenges with confidence; moreover, triggering the innovative and problem solving capabilities through Intellectual Stimulation and lastly giving respect to individualized preferences through the Individual Consideration (Bass & Avolio, 1993). All these characteristics are expected to establish positive organizational climate.

5.2 Organizational Climate and Overall Perception of Patient Safety

Result revealed that organizational climate had a positive significant influence on patient safety. A non-punitive organizational climate is expected to encourage reporting system. In a different study in Turkey, Bodur and Filiz (2010) found that the non-punitive climate was associated with perception of physicians and nurses about patient safety. Similar finding was also reported by Malloy et al. (2009) in their study that covered four countries (Canada, Ireland, Australia, and Korea). They found that nurses deprived of supportive climate usually had lower insight about safety climate.

According to the Transformational Leadership Theory, the inspirational Motivation denotes that the leader inspires the subordinates to have an optimistic attitude and pursue challenges with confidence, they learn to have confidence in their own ability (Bass & Avolio, 1995) this confidence which is perceived as part of the organizational climate would be in turn translated into trust of employees in ability of their health institute to face and handle adverse events in a way that would make patients more safer. In simple terms, the climate of trust created by the transformational leadership will be reflected on perception of the employees about patient safety.

5.3 Organizational Climate and Frequency of Occurrence of Adverse Events (Patient Safety)

We found a negative impact of organizational climate on occurrence frequency of adverse events. This means that the better the organizational climate, the lower the frequency of occurrence of adverse events. This result is in line with previous studies. For instance, Seibert (2009) demonstrated that positive safety climate reduced the frequency of occurrence of anesthesia errors as it increased interaction with supervisors and peers.

In a quasi-experimental study to examine the effect of changing safety culture through educational intervention to encourage hand washing as an attempt to reduce nosocomial infection, Larson et al., (2000) found that the reported methicillin-resistant Staphylococcus aureus (MRSA) infections six months after intervention were significantly reduced in two mid Atlantic hospitals in the US. Others found also a significant relationship between organizational climate and the frequency of occurrence of needlestick injuries (Larson et al., 2000).

In addition to that, this relationship in line with theories such as transformational leadership which encompasses several dimensions that almost all converge into creating an organizational climate that probe health care professional towards behaviors and performance which bring down the frequency of occurrence of adverse events (Bass & Avolio, 1995). Specifically, under the Idealized Influence (behavior), the climate within which the followers are working is giving them adequate capabilities to make decisions and motivate them towards sense of the organizational mission which are all needed for daily work and provision of care with minimal errors; also, the optimistic attitude mixed with confidence under the Inspirational Motivation dimension and the acquired problem solving techniques under the Intellectual Stimulation are essential while working under stressful situation and when facing critical cases which needs appropriate reactions with minimal risk; which are ultimately expected to diminish frequency of occurrence of adverse events.

5.5 Mediation Effect of Organizational Climate on the Relationship between High Performance Work System and Overall Perception of Patient Safety

Researchers indicated that the observed effect of HRM practices on performance is usually mediated by organizational climate created by the HRM practices (Takeuchi et al., 2009). Based on the psychological background proposed by Stringer Jr. (1968), the HRM practices considerably shape motivation of the employees which is directly reflected on their behavior and performance (Lin et al., 1999). The mediating role of organizational climate was also empirically observed in their study in Taiwan. They found that when employees perceived that the organization appreciates and values their contributions through supportive HR practices, they usually respond reciprocally by demonstrating cooperative behavior. Similar result was also reported by Piercy et al., (2006). They examined the relationship between individual perception of an organization's concern for employees at the individual level of analysis to demonstrate a positive relationship between the shared perceptions of the climate of concern for employees and employee helping behavior at the business-unit level of analysis.

The finding of the present study contributes to the existing knowledge as the above studies were conducted in a different context. But regardless of the contexts, it seems that the effect of HPWS on organizational climate and subsequently on organizational performance (such as patient safety as one of the indicators of performance) holds true.

6. Conclusion and Suggestions for Future Research

In conclusion, patient safety is still a substantial problem that affects both the health care system and the community in Saudi Arabia. Previous researchers tended to see the problem from a clinical point of view and less from the administrative side of it. Even if any, the latter studies tended to consider different factors in a disparate manner. Therefore the current study aimed at studying patient safety comprehensively from the administrative view. Hence, transformational leadership, HPWS, organizational climate, and effective reporting system were considered to have an influence on patient safety.

Result found suggests that transformational leadership determined positively HPWS, and these two variables had a direct significant impact on organizational climate, effective reporting system, and patient safety. Organizational climate was found to play a pivotal role in the model, as it had a direct significant impact on patient safety and frequency of occurrence of adverse events, and had a partial mediating effect on the relationship between HPWS and patient safety. Surprisingly, the study found a positive relationship between HPWS and frequency of occurrence of adverse events. Even though such contradiction is supported by previous research, further investigations are needed to explain why such finding occurs and if indeed it holds true in different settings and contexts.

The growing concern about patient safety is translated into several researches in developed countries where health institutions have different health care systems from developing countries (Al Rifai, 2008). According to the reports of the World Health Organization (WHO, 2004), health care systems in developing countries usually suffer from deficiencies in infrastructure and lack of skilled personnel and other quality issues. The situation is further exacerbated by the lack of effective reporting systems in addition to under reporting of medical errors and adverse events due to reasons related to the organizational characteristics (Parshuram et al., 2008). All these issues have important consequence on patient safety.

The official reports from authorities in Saudi Arabia indicated that adverse events in public hospitals represent a real problem which lay its shadow on the community (Arab News, 2012) as well as putting extra burden on the health facilities (Gulf/Saudi Arabia, 2012). The few researches conducted in Saudi Arabia showed that the medical errors were mainly attributed to faults of nursing practices (Al Harby, 2012). But scholars have also pointed out that patient safety is a shared responsibility of those with executive powers such as nurses' managers and top management (Roussel, 2006)

Future studies may also wish to test the research model on the individual level of analysis. Also, further researches are needed to study the relationship between HPWS and frequency of occurrence of adverse events to verify the inconsistency of the results.

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