Original Research Article

Correlation between quality of healthcare and safety culture in Saudi Arabia organizations

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ABSTRACT

Background: The current study aimed to examine the association between hospital nurses' attitudes about the safety culture and patients' views about the quality of healthcare services delivered to them during their hospitalization.
Methods: This study was cross section study as well as adopted the correlational design. The study used the hospital survey on patient safety culture to assess nurses' perceptions about the safety culture, and the consumer assessment of healthcare providers and systems survey to assess patients' experience of care. The current study was conducted in a tertiary healthcare organization in Riyadh city in Saudi Arabia.
Results: The response rates for nurses and patients were 79% and 80%, respectively. In nurses' sample, the majority 92.9% was female and 90.6% was non-Saudi; while 43.5% of patients were male and the majority was Saudi 97.1%. More than half of the nurses 57.2% were married and 35.4% identified themselves as single. On the other hand, the majority of patients 81.5% were married and 48.7% of patients had a diploma or high school or less.
Conclusions: The results of canonical correlation analysis showed positive and strong correlations between nurses' perceptions of safety culture (facilitators and threats to patient safety) and patients' perceptions of quality of healthcare (interpersonal care communication and technical quality of care). The canonical variates for both root pairs (canonical correlation coefficients = 0.89 and 0.81). This finding clearly proves that in workplaces where staffs have more positive perceptions of patient safety culture, patients have more positive experiences of care.

Keywords: Nurses, Quality, Safety culture, Saudi Arabia

INTRODUCTION

Patient safety is a critical component of quality healthcare and it is an essential principle of health services provided to patients. Concern with patient safety issues has a long history since the first article about medical error was published in British Medical Journal (BMJ) in 1865; however, the issue has become a high priority for health decision-makers globally since the 1990s.

The focus on patient safety issues started in the mid-1990s, especially after the publication of several seminal reports from the US Institute of Medicine (IOM) in 1999 'To Err is Human: Building a safer health system' and the UK department of health 'an organization with a memory' in 2000.[1,2]

Patient safety is a corollary of quality. Quality in healthcare is one of the fundamental aspects and objectives of any healthcare system. Quality is a shared issue and obligation with the need for collaboration and cooperation among all stakeholders in the organization. The foundation responsibility for ensuring quality and patient safety lied with policy decision-makers in the healthcare sector who should establish a culture that motivates all stakeholders to achieve a better and safer healthcare system.

Healthcare professionals' views can help to highlight important issues of patient safety. However, patients should routinely be involved in safety issues because they are privileged witnesses of events and they observe most of the care process since they are the centre of and the focus of the treatment process.[2] In addition, it was argued that although some patients may not understand the technical and clinical processes, they can observe the kindness, humiliation, the skillfulness of some procedures such as a line insertion, inconsistencies in care, and the errors.[2,3] Patients with chronic illnesses may be aware of most processes in their care, and nowadays, the patients tend to be more educated and the communities have established awareness of participation along with development of consumer rights movements. Therefore, the voice of patients should be heard, especially about the safety and quality of the care services provided to them.

The literature indicated that in a safe culture employees are guided by an organization-wide commitment to safety which will create an environment that will motivate healthcare professionals to choose behaviors that enhance, rather than reduce, patient safety.[4] Therefore, this study examined the associations between hospital nurses' perceptions of the patient safety culture in their institution, and the quality of care experienced by patients. The combined data from these two points of view will provide Saudi policy makers in healthcare with an enriched view of the quality environment in hospitals. The findings of this research will help pinpoint where quality efforts need to be focused.

Statement of the problem (literature review)

Patient safety is a global issue, affecting developed and developing countries at all levels. The Saudi Arabia is not exceptional. In Saudi Arabia, the rate of medical error cases to the total number of in-patients in the MOH hospitals increased from 0.7 per 1,000 admissions in 2007 to 1.03 per 1,000 admissions in 2010. The percentage of death cases because of medical errors in Saudi hospitals increased from 48.8% in 2007 to 53.4% in 2010.[5,6] The WHO reported in 2004 that around one in 10 people in the world receiving healthcare services suffered preventable harm, which makes the study of patient safety a significant and worthy task.[7]

What makes safety issues in healthcare systems unique, or different from other sectors, is the vulnerability of patients and the trust afforded by patients to staff in the healthcare system.[8] In addition, there are physical and psychological consequences, as well as potential social and economic impacts, of the care provided in healthcare organizations.[2]

The literature indicated that there is complexity in the potential relationships between safety culture and clinical outcomes. Therefore, this study contributed to knowledge by examining the relationship between safety culture and quality of healthcare and tried to fill the gap in the literature by providing evidence that quality of healthcare services is associated with the safety culture where these services are provided.

Significant of the study

There is little research about quality and patient safety culture in Saudi Arabian health institutions. However, the current research-based evidence is not sufficient on one hand, and holistic studies (such as perceptions both staff and patient and impact on culture and practice) have not been found on the other hand. Moreover, the recent coverage in the Saudi media about patient safety issues and the unsatisfactory level of quality of healthcare services in Saudi hospitals indicates widespread patient safety problems and the deficiencies of quality care in Saudi healthcare organizations. Therefore, it has become very important to conduct holistic research about patient safety and quality of healthcare in the Saudi healthcare context. This was the purpose of the current research.

Numerous studies have investigated the issue of patient safety culture and medical errors. However, few have explored the relationships between patient safety culture and patients' own experiences of the quality of healthcare. The study of relationship between safety culture and quality is a key focus of the work performed in this research. The attention of this kind of relationships in healthcare organizations will contribute significantly to the enhancement of patient safety and improved quality of healthcare services. The outcomes of this study can potentially make a significant contribution to knowledge about patient safety and quality issues. The current study aimed to fill gaps in the literature regarding relationship between safety culture and quality of healthcare in the Saudi context. Another contribution of the current study was examining the patient voice by assessing patient perceptions of the quality of healthcare services experienced during their stay in hospital. It was expected that this study will lead to other studies in other Saudi healthcare providers, such as MOH hospitals, teaching hospitals and private hospitals.

Objectives of the study

The current study aimed to examine the association between hospital nurses' attitudes about the safety culture and patients' views about the quality of healthcare services delivered to them during their hospitalization. Therefore, the study attempted to test the following hypothesis: There is a positive relationship between nurses' perceptions of safety culture and patients' perceptions of quality of healthcare services.

METHODS

This study was cross section study as well as adopted the correlational design. The current study considered exploratory and descriptive in nature and hence, used quantitative method. The study used the hospital survey

on patient safety culture (HSOPSC) to assess nurses' perceptions about the safety culture, and the consumer assessment of healthcare providers and systems (CAHPS) survey to assess patients' experience of care. The CAHPS and HSOPSC surveys were developed by the agency for healthcare research and quality (AHRQ). The CAHPS consist of six domains while the HSOPSC consists of 12 domains, in addition to the demographic questions. The two questionnaires were parallel and similar in many ways, and were developed through rigorous research. In addition, the two surveys used in the current study have all been shown to have high internal consistency, validity, standardized and credible tools, widely used, feasible in application, and free of charge.[9-12]

The current study was conducted in a tertiary healthcare organization in Riyadh city in Saudi Arabia. The HSOPSC was distributed to all nurses working in different hospital wards while the CAHPS was distributed to all patients who have been admitted in the hospital during data collection of the study. The data collection started from June to December 2012. The exclusion criteria for nurses and patients included the following areas: intensive care unit (ICU), emergency department (ED), psychiatric wards, and the pediatrics wards. It was very difficult to include patients in those departments due to ethical, cognitive, and capability reasons. In addition, it was assumed that nurses are very busy in these areas, especially in ICU and ED. Therefore, nurses and patients in these areas were excluded.

The sampling method used in the current study was non-probability sampling. The nurses and patients were recruited through purposive and consecutive sampling, respectively. The power analysis technique was used to calculate sample size prior to data collection. The G*Power program software version 3 was used and it showed that we need a minimum sample size of 191 for both nurses and patients. Moreover, the researcher also checked the sample size by calculating the studies predicators. It has been suggested that 'approximately 15 subjects per predicator are needed to generate a reliable regression equation'.[13] For nurses, the use of 13 predicators revealed that a minimum of 195 nurses were needed; for patients, the use of 16 predictors revealed that a minimum of 240 patients were required. These levels were comfortably exceeded in the planned and actual sample numbers.

Table 1: Cronbachs' alpha for 12 sub-scales in HSOPSC (n=395).

Safety culture domains	Number of items	Cronbach's alpha
Communication openness	3	0.65
Feedback and communication about errors	3	0.81
Frequency of event reporting	3	0.87
Handoff and transition	4	0.86
Management support for patient safety	3	0.78
Non-punitive response to error	3	0.83
Organizational learning-continuous improvement	3	0.60
Teamwork within units	4	0.80
Teamwork across units	4	0.68
Supervisors'/managers' expectations and actions promoting patient safety	4	0.76
Staffing	3	0.62
Overall perceptions of patient safety	4	0.76

Table 2: Cronbach's alpha for 6 sub-scales in CAHPS survey (n=727).

Patient dimension	Number of items	Cronbach's alpha
Communication with nurses	3	0.81
Communication with doctors	3	0.76
Responsiveness of hospital staff	2	0.82
Pain management	2	0.57
Communication about medicines	2	0.84
Discharge information	2	0.71

A pilot study has been completed for both nurses and patients. The internal consistency scale reliabilities were calculated for each of the six patient domains and the 12 nurses' domains. The Cronbach's alpha results showed highly reliable results in all domains of nurses and patients as Table 1 and 2 showed. The overall alpha value of the items in HSOPSC and CAHPS were 0.9 and 0.8, respectively.

Data from nurses and patients were coded and entered into the Statistical Package for the Social Science (SPSS) software version 20.0. The current study used multivariate statistical techniques to analyse the data and answer the main research question. Canonical correlation considered a logical extension of multiple regression analysis, and it was used because it can simultaneously correlate several metric dependent and independent variables.[14,15] In addition, canonical correlation is the most appropriate and powerful multivariate technique without the strict assumption of normality.[14-16] The general formula for canonical analysis is the following:

$$Y1 + Y2 + Y3 + \cdots + Yn = X1 + X2 + X3 + \cdots + Xn$$

RESULTS

The response rates for both nurses and patients were considered appropriate and acceptable. For patients, of 900 questionnaires sent out, 727 usable responses were obtained, representing a simple response rate of 80.7%. For nurses, of the 500 questionnaires sent out, 410 were returned. The responses on 15 nurses' questionnaires were incomplete due to invalid and missing information, leaving 395 (79.0%) complete questionnaires.

Table 3: Socio-demographic characteristics of nurses (n= 395).

Socio-demographic variables	Frequency	Percentage
Gender		
Male	27	6.8
Female	367	92.9
Nationality		
Saudi	28	7.1
Non-Saudi	358	90.6
Marital status		
Single	140	35.4
Married	226	57.2
Divorced	18	4.6
Widow	9	2.3

Table 3 and 4 showed different socio-demographic characteristics of nurses and patients, respectively. In nurses' sample, the majority 92.9% was female and 90.6% was non-Saudi. More than half of the nurses 57.2% were married and 35.4% identified themselves as single.

Table 4: Socio-demographic characteristics of patients (n=727).

Socio-demographic variables	Frequency	Percentage
Gender		
Male	316	43.5
Female	411	56.5
Nationality		
Saudi	704	97.1
Non-Saudi	21	2.9
Education level		
No qualification	193	26.6
Diploma/high school or less	353	48.7
Bachelor	162	22.3
Master/PhD	17	2.3
Marital status		
Single	91	12.6
Married	591	81.5
Divorced	9	1.2
Widow	34	4.7

The overall mean age of patients was 41 years with a standard deviation of 17 years. In terms of length of stay, the overall mean was 9 days with a standard deviation of 13 days. Table 4 shows that 43.5% of patients indicated that they were males and 56.5% identified themselves as female. In terms of nationality, the majority of patients were Saudi 97.1%. In relation to education level, 48.7% of patients had a diploma or high school or less, while 26.6% indicated that they had no qualification, and only 2.3% had master/PhD degrees. In terms of marital status, the majority of patients 81.5% were married, while 12.6% identified themselves as single.

Table 5: Canonical correlation between safety culture and quality of healthcare.

Variable	First canonical variate		Second canonical variate	
	r	Standardized canonical coefficient	r	Standardized canonical coefficient
Quality of healthcare domain				
Interpersonal	0.90	-0.54	0.85	0.84
Technical	0.84	0.85	0.33	0.51
% variance	48.8%		51.1%	
Redundancy	38		41	
Safety culture domain				
Facilitators	0.97	0.95	0.75	0.35
Threats	0.72	-0.23	0.66	0.97
% variance	51.5%		48.4%	
Redundancy	41		36	
Canonical correlation	0.89		0.81	

The first canonical variate in Table 5 showed that interpersonal care communication and technical quality of care (r=0.90 and 0.84 respectively) were indexed by facilitators of patient safety and threats to patient safety (r=0.97 and 0.72 respectively). The second canonical variate indicated that interpersonal care communication (r=0.85) was indexed by facilitators of patient safety and threats to patient safety (r=0.75 and 0.66 respectively).

In the first canonical variate, the percentage of variance for quality of healthcare was almost 49% with a redundancy of 38, while for safety culture the variance was 51.5% with a redundancy of 41. The second canonical variate in Table 5 showed that the percentage of variance for quality of healthcare was 51% with a redundancy of 41. The percentage of variance for safety culture in the second canonical variate was 48% with a redundancy of 36.

To sum up, the results of canonical correlation between nurses' perceptions of safety culture (facilitators and threats to patient safety) and patients' perceptions of quality of healthcare (interpersonal care communication and technical quality of care) showed positive and strong correlations between the canonical variates for both root pairs (canonical correlation coefficients =0.89 and 0.81). This result indicated clearly proved of the correctness of the hypothesis of the current study in terms of positive relationship between nurses' perceptions of safety culture and patients' perceptions of quality of healthcare services.

DISCUSSION

Canonical correlation analysis ascertained the relationship between safety culture and quality of healthcare services. This finding clearly proves that in workplaces where staffs have more positive perceptions of patient safety culture, patients have more positive experiences of care. Supporting this finding, a recent study that found a general pattern of positive relationships between safety culture perceptions and patient experience.[17] In addition, there are other studies have highlighted the importance of the relationship between safety culture and service quality on patient outcomes.[18-20]

There was an interdependent relationship between safety and quality and there was no sharp dividing line.[2] The study of patient safety as a new discipline enriches the quality movement with a new force, ideas and new approaches to continue the improvement of healthcare services. The findings of the two study will help decision-makers in the Saudi healthcare system to improve both safety and quality in Saudi hospitals.

The current study has limitation in terms of generalization of the findings; however, this study was unique in different ways. It was considered the first study in the Saudi Arabia that has examined the relationship between safety culture and quality of healthcare. The findings of the current study could be used as a base for comparison with any future research. In addition, the current study used a unique technique to connect the answers of nurses and patients. This connection helped to identified links between problems of safety culture by nurses and quality of healthcare by patients during their hospitalization.

CONCLUSION

The current study recommended involving patients in decision-making process about safety issues and the healthcare services provided to them. The patients are the corner-stone of any healthcare system, and can identify areas that need to be improved. Therefore, the patients' voice should be heard. Moreover, the current study recommended to establish an independent patient safety unit connected to the quality management department in hospitals. This unit would monitor the activities of the quality department in relation to patient safety issues in all departments/wards of the hospital. It is also recommended that the unit be empowered, as part of its functions to assess patient safety in hospital. The oversight function of the unit will ensure that different departments/wards establish a safety culture and provide high quality healthcare services.

Finally, future studies similar to the current studies need to be conducted in order to give the Saudi decision-makers a picture of the level of safety culture and the perceived quality of healthcare services.

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