

Do Socio-Demographical Characteristics of Healthcare Professionals Influence their Perceptions of Patient Safety in Hospitals? Evidence from Turkey

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Abstract

The main purpose of the present study is to investigate possible effects of socio-demographical characteristics of healthcare professionals on their perceptions of patient safety level, patient safety culture, causes of medical errors and witnessing to/reporting medical errors in hospitals. A survey was conducted over 1,028 healthcare professionals of a large government-based university research hospital in Turkey. 786 people responded with a resulting usable response rate of 76.45%. According to the results, the health employee's number of written medical error reports and perceived degree of patient safety influence his/her perception of the level of the patient safety culture. The health employee's age, weekly working hours and number of years in the same hospital impact the perceived importance of the causes of medical errors. Healthcare professionals who received formal training on patient safety and/or see their organization as a workplace with a strong patient safety culture are more likely to notice and report medical errors and view the level of patient safety within their organization positively.

Keywords: Medical Errors, Patient Safety, Hospitals, Health Employees, Healthcare.

Introduction

Organizational culture is a concept often used to describe shared corporate values that influence members' attitudes and behaviors. The concept of patient safety culture acknowledges patient safety as a top priority within the organization and recognizes it as a common value (Cooper, 2000; Pizzi et al., 2001). Ensuring patient safety is the responsibility of all employees within the organization. In ensuring patient safety, it is imperative that employees involved in each stage of the healthcare service delivery should act consciously and responsibly (Kaissi, 2006).

Attaining a high level of patient safety is a critical issue within the healthcare delivery system. Experts estimated that there were 98,609 adverse medical events in the acute care hospitals of the New York State in 1984 alone and 27,179 of these adverse events were due to

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negligence (Brennan et al, 1991). Deficient given orders, preparation errors, calculation errors, and managerial/administrative errors are among the most common types of medical errors.

Previous studies conducted in the healthcare field reveal that work experience, communication, and work organization are the factors that are closely associated with patient safety and that medical errors occur mainly due to heavy workload, insufficient job experience, and weak judgment power, and that the errors can be prevented by gaining better communication skills and by sharing of responsibilities within the team (Alfredsdottir and Bjornsdottir, 2007).

The development of a culture of safety in the organization plays a pivotal role in promoting the declaration of medical errors by health employees. In the organizations where a culture of safety has been developed, not only the focus is on the individual who has committed the error, but also the factors that led to the error are evaluated along with the error sources that are present in the system instead of the individual's insufficiency responsibly (Kaissi, 2006). It is asserted that an accusing and punishing culture in the organization is the most important obstacle to error declaration. It has been reported by past studies that healthcare employees are fearful of the implementation of discipline procedures, and have concerns that the declaration of an error will be used in an unfavorable manner and, as a result, their career will be adversely affected by it (Yilmaz, 2009; Uribe et al, 2003). These are serious concerns on the part of the healthcare employees and should be properly investigated and addressed by the health organization.

Patient Safety Culture

Among the main characteristics of healthcare services, the adjective term "safe" is defined as the prevention of harm to the patient occurring in the form of injuries, disabilities, and death by offered services (Akgun and Al-Assaf, 2007). According to the definition of the National Patient Safety Foundation, ensuring patient safety means preventing errors in healthcare services and eliminating and reducing the harm to the patient resulting from such errors (NPSF, 2009). Ensuring patient safety is to avoid mistakes from occurring while helping patients, to take precautions against accidental injuries, to reduce the error probability during processes and procedures, and to prevent the occurrence of errors (Aydin, 2007; ICN, 2006; www.whpa.org, 2009).

The development of patient safety requires a complex system consisting of many activities including performance development, environmental safety and risk management, infection control, safe drug use, secure team, safe clinical application, and secure care environment (Vincent, 2003). The basic goal of patient safety can be listed as to develop new designs that will prevent the occurrence of simple errors in processes, to detect errors before they affect patients, and to take precautionary measures that will ensure proper reporting and correction of errors (Richardson and Brier, 2001). Ostensibly, the development and maintenance of a culture of patient safety is central to the safety of the patients and therefore, all healthcare facilities or institutions should emphasize the development and nurturance of such cultures.

The concept of culture comprises of the shared attitudes, beliefs, values and assumptions that underlie how people within the organization go about performing their tasks. The same concept also applies to patient safety culture (Claridge and Sandars, 2007). Healthcare organizations may conduct periodic safety culture assessments for a variety of reasons, but these reasons are not mutually exclusive and, indeed, can often occur in combination. Culture assessments can be utilized for the purposes of: (1) diagnosing safety culture to identify areas for improvement and raising awareness about patient safety; (2) evaluating patient safety

interventions or programs and tracking change over time; (3) conducting internal and external benchmarking; and (4) fulfilling directives or regulatory requirements (Nieva and Sorra, 2003).

The patient safety culture can be viewed as one of the critical systems or conditions that are closely linked to the problem of errors in health care (Singla et al, 2006). The events that unfavorably affect patient safety are mainly lack of information, insufficient care, false medication administration, false and insufficient patient records, lack of either equipment or instrument, surgical interventions on the wrong side, fall or injury of patient, hospital infections, errors in identity control, and transfusion errors (Ballard, 2003; Cakmakci, 2006). Some of these adverse events can be prevented by developing and maintaining strong patient safety cultures in hospitals. Inevitably, understanding the determinants of the patient safety culture is very critical for the effective development of such safety-focused cultures in health organizations.

Medical Errors

A medical error was defined as an "unexpected result; adverse or unexpected event containing death, serious physical or psychological damage or damage risk during the medical service offered to the patient" (NPSF, 2009; Akalin, 2005; Guven, 2007). The consequences of medical errors can be listed as a prolonged stay in the hospital, an increase in either mortality or morbidity, the harm that the patient and his/her relatives are exposed to and the legislative challenges associated with these (Guyen, 2007). Moreover, medical errors can cause a loss of either morale or motivation in healthcare providers, the lack of confidence in the physicians and dissatisfaction among the public over the health care system. All of these lead to inefficiency in healthcare professionals and ultimately a reduction in the overall health status of the public (Kohn et al, 2000).

Leape and his colleagues reported that the most commonly encountered medical errors include medication errors (19%), surgical wound infections (14%), diagnosis errors (8%), therapy errors (8%), errors related to procedures (7%), and falls (3%). Surgical errors constitute to almost the half of all errors (48%). At the same time, it was stated that medical errors occur mostly in the operating room (41%) and then in the patient room (27%). These units are followed by the emergency services, delivery room, and the intensive care unit (each of them is approximately in a ratio of 3%) (Leape et al, 1991).

Medical errors can occur at any stages of healthcare services and they can be classified under the following categories (Pronovost et al, 2005): (1) medication errors, (2) surgical errors, (3) diagnosis errors, (4) errors associated with system failures, and (5) errors associated with other causes.

A medication error is the most important patient safety challenge and it tops the list of medical errors (Leape et al, 1991; Armitage, and Knapman, 2003). Even in the best hospitals, medication errors that have serious consequences or lead to serious problems are seen in 7 out of every 100 patients (Bates et al, 1995).

Surgical errors are the errors occurring during the preparation for the surgery and during a surgery. A false surgical intervention applied to a patient and procedures done on the wrong side of the patient are the errors of this kind. As a preventive measure, an informational checklist should be used before beginning a surgical intervention in order to make sure that the intervention is performed on the correct patient, with the correct procedure, and on the correct body part, and in addition, to determine the particulars of all necessary documents and equipment (Mendez-Eastman, 2006; Zohar et al, 2007).

A false diagnosis may lead to a false and insufficient therapy or unnecessary additional examinations. The false reports coming from the diagnosis and imaging units (roentgen, biochemistry, hematology, pathology, etc.) have been frequently cited in the literature to be the basic causes of medical errors (Weingart et al, 2000).

Errors associated with system failures are the errors that occur during the presentation of a healthcare service and are extremely difficult to detect. It is estimated that more than 1.4 million people all over the world suffer from infections acquired in hospitals. Infections related to healthcare take place all over the world and they occur in developed as well as in developing countries (WHO, 2007).

The errors associated with other causes may result from ineffective communication, hospital infections, unsecured blood transfusions, fall of the patient or unsecured patient transfers, and anesthesia complications. An injury due to the fall is the most frequent problem that nurses face today. Falls can lead to health problems with increased risks. 30% of falls originating from hospitals result in serious injuries (Asti and Acaroglu, 2000; Hendrich, 2006).

Healthcare professionals can play a major role in the prevention and detection of medical errors in hospitals. It is their responsibility to properly record and report these errors as they occur. Therefore, it is important to understand the viewpoints of healthcare professionals on likely causes of medical errors and error-reporting behavior.

The main objective of the present study is to explore potential effects of socio-demographical characteristics of healthcare professionals on their perceptions of patient safety, patient safety culture, causes of medical errors and witnessing to/reporting medical errors in their workplace. More specifically, this study aims to answer the following research questions: (1) Which socio-demographical characteristics of healthcare professionals are linked to the level of the perceived patient safety culture, and the perceived importance of causes of medical errors?, (2) Do the type of the health employee's profession and the extent of his/her training on patient safety make any differences in his/her witnessing to medical errors?, and (3) Is there an association between the health employee's perception of the patient safety culture and his/her witnessing to medical errors? This study is exploratory in nature and aims to address these important research questions. The associated research framework is presented in Figure 1.

[Place Figure 1 about here]

Materials and Methods

Survey research was conducted to gather the data. The self-administered survey method was utilized. The survey instrument was developed on the basis of a comprehensive literature review and in-depth interviews with a number of healthcare professionals/experts. In preliminary fieldwork, the main objective of conducting in-depth interviews were to improve the reliability and validity of the survey instrument and measurement scales. According to the results of the fieldwork, some modifications in the preliminary survey instrument were made. Then, the revised survey instrument was pre-tested over a small representative sample, and on the basis of the pre-test results, the necessary final revisions on the survey were made.

The survey instrument contained two measurement scales exhibited in Appendix 1. The first measurement scale, the medical errors scale, was developed on the basis of a careful review of the relevant literature and consists of five dimensions including the causes of medication administration errors, surgical errors, errors in diagnosis process, and errors associated with system failures, and other causes. It has a total of 45 items (Yilmaz , 2009; Pronovost et al,

2002; Inanir and Serbest, 2009; Sezgin, 2007; Ulgen, 2009). The scale is based on an itemized rating scale ranging from 1 (not important at all) to 5 (extremely important).

The second measurement scale, the patient safety culture scale, that was designed by the AHRQ measures the perceived level of the “patient safety culture” in an organization and consists of 24 items. This scale encompasses dimensions such as the relationships in the working unit, the attitudes of managers, communication, and hospital practices (www.ahrq.gov). This instrument was measured via a Likert scale anchored by 1 (strongly disagree) and 5 (strongly agree). In the patient safety culture scale, Items 3, 5, 9, 10, 13, 18, 20, 21, 22, and 23 were reverse-scored.

The survey instrument contained some additional questions with respect to the witnessing to medical errors, the number of medical error reports and the reasons for non-reporting, and some socio-demographical characteristics of the survey participants.

The target respondents for the survey were the healthcare employees of a large, university research hospital in Turkey. The universe of the study included 1,028 healthcare employees (433 physicians, 515 nurses, 10 pharmacists/assistant pharmacists, 58 medical technicians, and 12 chemists/biologists) that had been working at Turgut Ozal Medical Center at the time of the survey deployment. The survey was conducted between October 03, 2009 and December 31, 2009. A census of the research population was taken. A total of 786 health care employees responded to the survey. The resulting usable response rate was 76.45%.

In the study, descriptive statistical methods (frequency, percentage, mean, standard deviation, and so on) were primarily employed to analyze the data. The Kolmogorov-Smirnov distribution test was used to test the adequacy of the data for the normal distribution. The Mann Whitney U test, the Kruskal Wallis test, a Pearson-Chi-Square analysis, a Spearman Correlation analysis, and a Stepwise Regression analysis were also used to further analyze the data. The results were assessed using the significance level of 0.05.

Respondent characteristics

Table 1 displays the main characteristics of the sample. Overall, as high as 63.1% of the survey respondents were female. Of the entire respondents in the sample, 52.9% were at an age of equal to or less than 30 years, 56.4% were working equal to or less than 40 hours a week, 50.0% were nurses, 74.5% had undergraduate and/or graduate degrees, 47.6% had been working in their current profession for equal to or less than 5 years, and 65.4% had been working in this hospital for equal to or less than 5 years. These characteristics of the sample demonstrate that the sample had a population of younger educated employees that was skewed toward females.

[Place Table 1 about here]

The age for the respondents ranged from 21 years to 60 years. The confidence interval for the mean age of the entire respondents was found to be 31.47 ± 6.325 at the 0.05 significance level. The amount of experience of the respondents in their current profession ranged from 1 to 38 years. The confidence interval for the mean value of the amount of years spent in the current profession was calculated as 8.19 ± 6.222 at the significance level of 0.05. Likewise, the range of the respondent's work experience in the current hospital varied between 1 and 20 years. The confidence interval for the mean value of work experience of the respondents in the current hospital was found to be 5.59 ± 4.716 at the 0.05 significance level.

Results

Validity and Reliability Assessments

Initially, the reliability and validity of the measurement scales were assessed through a confirmatory factor analysis (CFA) using the AMOS software package. According to the results of the CFA, the medical errors scale had a good fit with the data (CMIN=2607.509; DF=897; CMIN/DF=2.907; $p=0.000$; GFI=0.866; NFI=0.886; IFI=0.922; TLI=0.914; RMR=0.042; CFI=0.922; RMSEA=0.049). The results of a confirmatory factor analysis of the patient safety culture scale indicated a low level of fit between the data and measurement scale. Consequently, some modifications were made on the scale to provide a better fit. On the basis of the modification indices and standardized residuals, two links between the working unit sub-dimension items were removed. Items 3 and 9 were eliminated since they had the low factor loadings. A CFA was conducted again on the modified version of the measurement model and the results showed that the measurement model had a good fit with the data (CMIN=461.509; DF=185; CMIN/DF=2.491; $p=0.000$; RMR=0.078; GFI=0.949; NFI=0.851; IFI=0.905; TLI=0.879; CFI=0.903; RMSEA=0.044).

The reliability coefficients (Cronbach's Alphas) of the scales were found to be 0.963 for the medical errors scale and 0.751 for the patient safety culture scale. The reliability coefficients of the scales exceeded the threshold value of 0.70, and therefore, they were acceptable. Table 2 presents the mean, standard deviation and Cronbach's Alpha associated with each sub-dimension of the measurement scales.

[Place Table 2 about here]

Patient Safety Culture and Medical Errors

As Table 2 demonstrates, there are strong and positive significant associations ($p<0.001$) between the sub-dimensions of the medical errors scale as expected. Similar correlations were observed with the sub-dimensions of the patient safety culture scale. Especially, there are very strong and positive correlations between the relationship in the working unit and attitudes of managers as well as between communication and hospital practices ($p=0.001$).

In addition, there are statistically significant, positive correlations between the relationship in the working unit and the perceived importance of causes of medical errors ($p<0.001$), hospital practices and surgical application errors ($p<0.005$), and errors in diagnosis process ($p<0.001$) and other causes of errors ($p<0.005$). In contrast, there are no statistically significant correlations between the attitudes of managers and the causes of surgical errors, between communication and causes of surgical errors, between relationship in the working unit and medication administration errors, between hospital practices and medication administration errors, and finally between hospital practices and errors associated with system failures ($p>0.05$).

Assessment of Patient Safety Level by Profession

Most of the survey respondents evaluated the patient safety level of their workplace positively (See Table 3). Although 59.3% of healthcare professionals participated in the study found the current patient safety level to be 'acceptable', 17.9% evaluated it as 'very good'; 17.3% viewed it as 'perfect'; 4.6% rated it as 'weak'; and only as little as 0.9% found it to be 'unsuccessful'.

[Place Table 3 about here]

A cross-tabulation analysis was performed between the perceived level of patient safety and the categories of the respondents' professions. According to the results of the χ^2 testing, there were statistically significant differences in the evaluation of the current patient safety level across the three categories of professions (Chi-Square=59.03; $p<0.05$). While nurses and physicians evaluated the current degree of patient safety as acceptable, other health employees assessed it as either acceptable or very good or perfect (Table 3).

Effects of Health Professional Characteristics on Patient Safety Culture

Next, a Stepwise Multiple Regression Analysis was conducted to determine the predictors of the patient safety culture. The health employee's age, profession, number of years in the current profession, number of years in the current hospital, weekly working hours, number of written medical error reports and perceived degree of patient safety evaluation were treated as independent or explanatory variables in this analysis (See Figure 1).

According to the results of the regression analysis, the health employee's number of written medical error reports and perceived degree of patient safety of the hospital had significant effects on the patient safety culture ($F=48.539$; $p=0.000$). The correlation coefficient of the model was 0.332, and the estimated model explained 11.0% of the variation in the patient safety culture variable (Table 4).

[Place Table 4 about here]

Effects of Health Professional Characteristics on Perceived Importance of Causes of Medical Errors

Another Stepwise Multiple Regression Analysis was conducted to predict a regression model that explains the variation in the mean values of the medical errors construct or variable. The health employee's age, profession, number of years in the current profession, number of years in the current hospital, weekly working hours, number of written medical error reports and perceived degree of patient safety were used as independent or explanatory variables (See Figure 1).

According to the results of the regression analysis, the employee's age, weekly working time and number of years in the current hospital had significant effects on the medical errors variable ($F=20.571$; $p=0.000$). The correlation coefficient of the model was 0.270, and the estimated model explained 7.3% of the variation in the mean values of medical errors variable (Table 4).

Assessment of Being a Witness to Medical Errors by Profession

According to the information obtained from the healthcare professionals participated in the survey, medication administration errors were witnessed by 48.2%, surgical application errors by 27.0%, diagnosis errors by 47.6%, errors associated with system failures by 44.4%, and errors associated with other causes by 41.5% of the survey participants.

The results of the Chi-Square analysis indicated that there are statistically significant differences in the percentages of being or not being a witness to medical errors across the three groups of professions ($p<0.05$). According to the research results, medical errors were witnessed more by physicians than the other professions. In general, the other health employees witness to medical errors less since they do not interact with the patients as much as physicians and nurses do (Table 5).

[Place Table 5 about here]

While 35.9% of the health employees who participated in the survey addressed that they did not witness to any medical errors, 28.4% of them did not want to comment on this issue. In contrast, only 1.7% of the health employees expressed that they informed physicians or nurses after witnessing to a medical error. The health employees expressed that they did not inform hospital managers about medical errors because (1) they verbally warned the person who made a medical error (4.6%), (2) a supervisor nurse intervened in the situation (2.1%), (3) they did not know that they needed to notify the hospital authorities (7.1%), (4) they thought that they did not have any responsibilities with regard to reporting a medical error (3.6%), (5) they thought that the causes of errors could not be eliminated (6.5%), (6) The error did not cause any complications for the patient (7.5%), and (7) they thought that the identity of the person who made an error should not be disclosed (2.5%).

Assessment of Witnessing to Medical Errors by Training Status on Patient Safety

50.6% of the health employees that participated in the survey received training on patient safety and medical errors. Of these, 42.5% received training on medical errors and patient safety during their formal education process; in response, 57.5% received this training in the forms of an orientation and/or in-service. According to the results of the cross-tabulation analysis, the health employees who received training on patient safety witnessed to medical errors more than those who did not receive any training (Table 6).

[Place Table 6 about here]

Discussions

Patient safety is one of the most critical issues with respect to the delivery of a health care service. According to the results of the present study, most of the healthcare employees participated in the survey evaluated the current level of patient safety in their organization in the range of “acceptable” to “perfect”. However, a small portion of the health employees (5.5%) found the current level of patient safety as either “weak” or “unsuccessful”. Thus, the majority of the healthcare professionals participated in this study were satisfied with the level of patient safety in their hospital. These results are somewhat consistent with those of the study conducted by Cakir and Tutuncu (2009). In that study, 46.3% of the staff members surveyed stated that the level of patient safety was good at their hospital; 31.1% of them indicated that it was neither good nor bad; and 22.4% of them revealed that it was the worst at their hospital. The degree of patient safety was evaluated lower by physicians and nurses than the other health employees in the current study.

The employee's number of written medical error reports and perceived degree of patient safety of the hospital were found to be the predictors of the patient safety culture. In contrast, the health employee's age, weekly working time and number of years in the current hospital had significant impacts on perceived importance of causes of medical errors. According to these results, the health employees that wrote more medical error reports and evaluated the degree of patient safety at their institution more positively viewed their organization as one with a high degree of the patient safety culture. Similarly, if the health care employee's weekly working hours, age, and number of years in the same hospital go up, s/he is more likely to put higher importance on the causes of medical errors. This finding suggests that as the health employee gains more experience on the job and even in life, he/she will become more knowledgeable and conscious on the causes of medical errors.

According to the results of the study, most of the health employees (48.2%) witnessed to medication administration errors. Interestingly, although it is the duty of the nurses to administer medications to patients on time and in the appropriate doses, according to the results of the study, the percentage of being a witness to medication errors is higher among the physicians (52.9%) than nurses (48.1%). However, medical application errors are likely to occur more among nurses who spend approximately 40% of their working time on medical applications.²⁴ In terms of the percentage of the health employees who are witnessing, medication administration errors were followed by errors in diagnosing, errors associated with system failure, errors associated with other causes, and surgical application errors. While medical errors were witnessed by physicians at the highest percentage, the other health employees witnessed to them at the lowest percentage.

A significant portion of the health employees who participated in the survey expressed that they did not inform hospital managers about medical errors that they witnessed to because they thought that the causes of errors could not be eliminated (6.5%) and that the identity of the person who made the error should not be revealed (%2.5). These results show that health employees have some problems with trusting their managers. 7.1% of the health employees expressed that they were not aware of the requirement to notify their supervisors about the medical error, and 3.6% of them thought that they did not have any responsibilities for reporting the errors.

Even though the hospital under study has a high level of the perceived patient safety culture, a significant portion of the health employees still feel hesitant to comment on medical errors that they witnessed to in the hospital. Many respondents witnessed to various medical errors on their job, yet did not report them to the proper authorities. This pattern of nonresponsive behavior goes against the spirit of the patient safety culture. This finding suggests that employees should be encouraged to not only notice but also report these adverse events in a timely manner. These results are eye-opening and underline the need for providing proper training for health employees about patient safety and error reporting.

The study results revealed that the health employees who received training on patient safety witnessed to medical errors more. Therefore, it is believed that offering proper training to health employees on patient safety is very critical and helps employees develop higher levels of a sense of responsibility and ability to notice medical errors. Only 50.6% of the health employees that responded to the survey received training on patient safety and medical errors. Almost the half of the health employees of the hospital lacked this critical training.

The following managerial policy recommendations are made in accordance with the findings of this study:

- The hospital management should develop strict institutional policies that establish patient safety as one of the top priorities of the organization and that ensure the development of a strong patient safety culture. Prior to the establishment and development of such policies, the quality and effectiveness of existing management processes and practices should be assessed carefully. The healthcare employees regardless of their profession should be encouraged to notice and report problems of patient safety in their unit and better communication systems should be adopted in order to facilitate this.
- The majority of healthcare employees suggest that patient safety should have a priority within the organization and they seem to be willing to support and actively contribute to the management's effort and initiatives on developing patient safety. In response, the organization should offer in-service training programs for its health employees on patient safety and causes of medical errors and keep them informed about the latest developments on these issues on a regular basis. Satisfactory training on patient safety

may facilitate the recognition and reporting of medical errors. Especially, physicians should be encouraged to report medical errors given that they are the ones that most often witness to these errors.

- Although almost the half of healthcare professionals report that they have witnessed to medical errors, they choose the way of not reporting such incidents. The hospital management should make a serious effort on creating an effective query system that allows healthcare professionals to report medical errors that they witness to without any fear. The root causes of the reported medical errors should be examined carefully and preventive measures should be taken in order to curb the future occurrences of similar medical errors.

Conclusion

The results of this study suggest that patient safety is viewed by healthcare professionals as one of the most critical aspects of the medical service delivery. Those healthcare professionals who see their organization as a workplace with a strong patient safety culture are more likely to notice and report medical errors and view the level of patient safety within their organization positively. A significant segment of health employees prefer not to report the medical errors they witnessed to for various reasons. Providing proper training to health employees on patient safety appears to be a valuable investment since training develops the employee's ethical perspective/responsibility and ability to notice medical errors and their potential causes.

This study has one important limitation. As mentioned earlier, the study results are based on a survey that was conducted over a large group of the healthcare professionals who worked at a university research hospital, Turgut Özal Medical Center, affiliated with the School of Medicine at Inonu University in Turkey. Even though the data utilized for this study was gathered from a single healthcare institution, the empirical links revealed by the study may be generalized to other healthcare settings around the globe. However, any attempt to project the research results to other situations/settings or populations should be made with caution.

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Table 1: Characteristics of the Respondents

Characteristic	Response Categories	n	%
Gender	Female	495	63.0
	Male	291	37.0
Age	≤30	416	52.9
	31-40	298	37.9
	≥41	72	9.2
Number of years in the current profession	≤5 years	374	47.6
	6-10 years	159	20.2
	≥11 years	253	32.2
Number of years in the current hospital	≤5 years	514	65.4
	6-10 years	129	16.4
	≥11 years	143	18.2
Weekly working hours	≤40 hours	443	56.4
	≥41 hours	343	43.6
Profession	Nurse	393	50.0
	Physician	322	41.0
	Other*	71	9.0
Educational state	High school	62	7.9
	Associate degree	138	17.6
	Undergraduate	243	30.9
	Graduate degree	343	43.6

(*) Pharmacist, assistant pharmacist, health technician, chemist, biologist.

Table 2: Validity, Reliability and Correlation Analyses for Patient Safety Culture and Medical Errors Constructs

	1	2	3	4	5	6	7	8	9
Causes of medication administration errors (1)	1								
Causes of surgical application errors (2)	.656**	1							
Causes of errors in diagnosis process (3)	.611**	.629**	1						
Causes of errors associated with system failures (4)	.596**	.649**	.733**	1					
Errors associated with other causes (5)	.607**	.661**	.764**	.769**	1				
Relationship in the working unit (6)	.037	.126**	.163**	.126**	.136**	1			
The attitudes of managers (7)	-.053	.006	-.016	-.044	-.021	.315**	1		
Communication (8)	-.018	.043	.068	.036	.065	.393**	.460**	1	
Hospital practices (9)	.015	.071*	.097**	.055	.085*	.187**	.274**	.281**	1
Mean	4.07	4.05	4.19	4.11	4.18	3.46	3.22	3.29	3.17
S.D.	.638	.687	.813	.727	.721	.543	.868	.659	.586
A	.866	.903	.925	.897	.865	.560	.620	.605	.530

(**) Correlation is significant at the 0.01 significance level (2-tailed)

(*) Correlation is significant at the 0.05 significance level (2-tailed)

Table 3: Assessment of Patient Safety Level by Profession

Patient Safety Level	Nurse		Physician		Other		Total	
	n	%	n	%	n	%	n	%
Unsuccessful	4	1.0	2	0.6	1	1.7	7	0.9
Weak	7	1.8	25	7.6	4	6.7	36	4.6
Acceptable	224	56.7	225	68.0	17	28.3	466	59.3
Very Good	85	21.5	39	11.8	17	28.3	141	17.9
Perfect	75	19.0	40	12.1	21	35.0	136	17.3
Chi-Square=59.03; p=0.000								

Table 4: Effects of Health Professional Characteristics on Patient Safety Culture and Medical Errors

Model	b	S.E	B	t	p	R	R ²	F	p
Patient Safety Culture Model									
Constant	2.780	.061		45.405	.000				
1	.154	.017	.304	9.017	.000	.310	.096	83.464	.000 ^(a)
2	-.216	.061	-.119	-3.521	.000	.332	.110	48.539	.000 ^(b)
Medical Errors Model									
Constant	4.393	.084		51.999	.000				
1	-.196	.043	-.161	-4.552	.000	.203	.041	33.793	.000 ^(c)
2	.162	.033	.210	4.917	.000	.229	.052	21.689	.000 ^(d)
3	-.162	.039	-.176	-4.174	.000	.270	.073	20.571	.000 ^(e)

b Unstandardized regression parameter estimates

B Standardized regression parameter estimates

(a) The degree of perceived patient safety

(b) The degree of perceived patient safety, the number of written medical error reports

(c) Weekly working hours

(d) Weekly working hours, number of years in the current hospital

(e) Weekly working hours, number of years in the current hospital, age

Table 5: Assessment of the Status of Being a Witness to Medical Errors by Profession

Status of being a witness to medical errors	Profession	Yes		No		Chi-Square	p
		n	%	n	%		
Medication administration errors	Nurse	190	48.1	205	51.9	17.752	0.000
	Physician	175	52.9	156	47.1		
	Other	14	23.3	46	76.7		
	Total	379	48.2	407	51.8		
Surgical application errors	Nurse	90	22.8	305	77.2	8.452	0.015
	Physician	107	32.3	224	67.7		
	Other	15	25.0	45	75.0		
	Total	212	27.0	574	73.0		

Errors in diagnosing	Nurse	148	37.5	247	62.5	49.580	0.000
	Physician	206	62.2	125	37.8		
	Other	20	33.3	40	66.7		
	Total	374	47.6	412	52.4		
Errors associated with system failure	Nurse	165	41.8	230	58.2	16.450	0.000
	Physician	169	51.1	161	48.6		
	Other	15	25.0	45	75.0		
	Total	349	44.4	436	55.5		
Errors associated with other causes	Nurse	148	37.5	247	62.5	17.554	0.000
	Physician	163	49.2	168	50.8		
	Other	15	25.0	45	75.0		
	Total	326	41.5	460	58.5		

Table 6. Assessment of Witnessing to Medical Errors by Training Status on Patient Safety

Status of witnessing to medical errors	n	Mean Rank	MWU	p
Medication administration errors	Yes 398	423.16	65406.00	0.000
	No 388	363.07		
Surgical application errors	Yes 398	431.07	62260.00	0.000
	No 388	354.96		
Errors in diagnosing	Yes 398	426.07	64249.50	0.000
	No 388	360.09		
Errors associated with system failure	Yes 398	418.78	67151.50	0.002
	No 388	367.57		
Errors associated with other causes	Yes 398	425.37	64527.00	0.000
	No 388	360.81		

Figure 1. An Exploratory Framework of Patient Safety Level, Patient Safety Culture and Causes of Medical Errors

