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RESEARCH ARTICLE

**Physicians' Readiness to Report Major Medical Errors and Organizational Culture  
toward Patient Safety**

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## **Abstract**

Medical errors have been detrimental in the field of medicine. They have impacted both patients and doctors. While physicians recognized that error disclosure was an ethical and professional obligation, most remained silent when mistakes happened for different reasons. Guided by the theory of planned behavior and Kant's deontological theory, the purpose of this quantitative study was to investigate organizational culture toward patient safety as a perceived barrier affecting physicians' willingness to report major medical errors. An association was tested between organizational culture toward patient safety, and the dependent variable physician willingness to disclose major medical errors. Using a cross-sectional method, 122 doctors out of 483 surveyed, completed the online and paper-based survey. Multiple linear regression and descriptive statistics models were used to analyze and summarize the data. The results showed there was a statistically significant relationship between the independent variables organizational culture toward patient safety, and the dependent variable physician willingness to disclose major medical errors. The findings added to the knowledge base regarding barriers to physicians' medical errors disclosure. The results and recommendations could provide positive social change by helping hospitals raising doctors' awareness regarding major medical errors disclosure.

**Key words:** Medical errors, physician readiness, organizational culture, patient safety, theory of planned behavior, Kant deontological theory.

## Introduction

Medical errors are common today, and they happen regularly in hospitals and other health care organizations (Bonney, 2014; D'Errico et al., 2015; Guillod, 2013). The rate of these preventable adverse events among hospital patients ranged from 4% to 16% (D'Errico et al., 2015). For many years, medical errors became the focal point for patient safety and quality improvement (Lipira & Gallagher, 2014; Poorolajal, Rezaie, & Aghighi, 2015). Medical errors were ranked as the third leading cause of death in the United States (U.S.) resulting from either individual mistakes or system failures (Bonney, 2014; D'Errico et al., 2015; Kalra, Kalra, & Baniak, 2013; Nevalainen, Kuikka, & Pitkala, 2014). The Institute of Medicine, IOM (1999) estimated that medical errors were responsible for approximately 44,000 to 98,000 deaths annually in the U.S. While these medical mistakes caused fatalities, they also remained costly for the U.S. economy and hospitals that spent an estimated \$3.5 billion per year on costs associated with the errors (Kalra et al., 2013). However, the IOM (2001) offered prospective recommendations to reduce problems related to medical mistakes. These reports discussed medical errors issues and their consequences on patient safety and health care quality.

Medical errors remained an important issue for health care organizations and physicians in the U.S. and worldwide (Elwahab & Doherty, 2014; Plews-Ogen, Owens, & May, 2013). When the mistakes occurred, physicians were reluctant to report them. Although 87% of physicians recognized that it has been their ethical duty to admit errors, only 37% reported these errors (Anwer & Abu-Zaid, 2014; D'Errico et al., 2015; Kachalia & Bates, 2014). The reporting data showed a discrepancy between what physicians said and did. According to the AMA (2016), in the case of complications resulted from the physician's mistake, the physician is ethically required to inform the patient. Also, the Patient Safety and Quality Improvement Act of 2005 encouraged voluntary reporting of adverse events, and therefore, reinforced the AMA Code of Medical Ethics (Agency for Healthcare Research and Quality [AHRQ], 2012). However, despite these efforts to ease the disclosure of medical mistakes, medical errors were still underreported.

Disclosure of medical errors remained a significant measure of patient-centered healthcare, and an essential element of patient safety and quality improvement (Lipira & Gallagher, 2014; Martinez & Lehmann, 2013). Despite growing pressures to disclose errors, 51% of physicians who committed mistakes never reported the medical errors (Poorolajal et al., 2015). Underreporting of medical mistakes may be the results of barriers such as lack of appropriate training in handling medical mistakes and the fact that physicians were less likely to disclose errors they felt were not severe (Lipira & Gallagher, 2014; Poorolajal, 2015). Other factors that inhibited physicians' reporting of errors included fear of legal actions, loss of trust, and loss of job or position (Jahromi, Parandavar, & Rahmanian, 2014; Soydemir, Intepeler, & Mert, 2016; Wu et al., 2013). However, Zaghoul et al. (2015) showed that fear of litigation and other barriers such as loss of reputation and organizational culture constituted the biggest hurdle that limited doctors' ability to report mistakes. They laid out five factors that represented major barriers to disclosure. However, the factor on which this project was based included organizational culture toward patient safety. The U.S litigation system provided incentives through settlement to the patient who sued a doctor; however, not all states protected doctors' statements related to medical mistakes reporting. Therefore, this made it difficult for a doctor to disclose errors (Wu et al., 2013).

Although all these factors impacted errors reporting, the proposed project only focused on organizational culture toward patient safety because the instrument we used to collect the data

drew attention to these barriers. Whatever the nature of the error, it should be reported once it occurred in accordance with the AMA Code of Medical Ethics. The study looked at major medical errors that included moderate and critical errors. These errors were frequent and leading causes of medical malpractice lawsuits (Schiff et al., 2009). While 87% (D'Errico et al., 2015) of physicians believed that it was ethical to admit mistakes, there should be a consensus on the subject. Nevertheless, there was a mismatch between what was said and done by medical doctors. Therefore, it was necessary to understand organizational culture toward patient safety as a factors that prevented a majority of physicians from reporting medical errors when they occurred.

The objective of the study was to contribute new understanding to existing knowledge on disclosure of medical errors. By understanding physicians' reluctance regarding errors admission and gaining insight into medical errors disclosure, it might be possible for hospitals and health care leaders to design an intervention to help physicians disclose medical mistakes as soon as they happened. After the introduction, the rest of the chapter focused on describing the study background, problem statement, purpose of the study, and research questions the study addressed. Further, the next sections of the chapter delineated the nature of the study and some relevant terms and provided an overview of the study limitations, assumptions, significance, and findings.

## **Background**

Approximately 44,000 to 98,000 people die in U.S. hospitals each year due to medical errors (Bonney, 2014; D'Errico et al., 2015; Guilod, 2013; IOM, 1999; Kalra, Kalra, & Baniak, 2013). While these errors caused harm, they remained underreported. Over a decade, the Joint Commission (2016) has mandated hospitals and physicians to divulge medical errors irrespective of the doctors' liability concerns, but compliance with this directive has not yet been completely attained in the U.S.

After the publication of the IOM critical report, policymakers, and health care leaders have worked tirelessly to initiate strategies and laws to alleviate patient harm and promote patient safety. Congress enacted the National Medical Error Disclosure and Compensation Act in 2005. The objective of the bill was to promote a culture of safety in U.S. hospitals through the enhancement of quality care by reassuring open communication between physicians and patients about medical errors, decreasing avoidable medical errors rates, and guaranteeing that patients received rational compensation due to medical harm resulting from medical mistakes. Furthermore, this bill minimized the costs of medical liabilities insurance for physicians and hospitals (The National MEDiC Act, 2005). However, a significant aspect of the bill was that it required doctors and hospitals to report any incident whether it was a medical mistake or patient safety incident (The National MEDiC Act, 2005). Seventeen years later after the IOM report and despite a widespread investment in patient safety initiatives, medical errors are still underreported, and the adverse events rates were still in the range of 4 to 16% (D'Errico et al., 2015; Shojania & Thomas, 2013).

Even though the AMA Code of Ethics (AMACE) recommended that physicians admit errors, physicians' disclosures differed significantly. Only 33% of nearly 90% of physicians who said that error disclosure was an ethical duty reported mistakes (Anwer & Abu-Zaid, 2014; D'Errico et al., 2015; Kachalia & Bates, 2014; Taggaddosinejad, Mesri, Sheikhezadi, Mostafazadeh, & Farahani, 2013). These statistics showed a discrepancy between physicians' willingness to admit errors and their current medical mistake reporting practices, but the reasons

behind this behavior was not well studied. However, the main reasons for physicians' reluctance to report errors were fear of litigation, loss of reputation, and absence of legal protection for doctors (Jahromi et al., 2014; Wu et al., 2013). Therefore, this study was required and significant as it sought to understand the perceived barriers that prevented doctors from reporting medical errors and their reluctance to comply with the Joint Commission mandate and the AMA Code of Ethics.

Their disclosure was essential as they could contribute to improving flaws that endanger patient safety (Crane et al., 2015). For this project, we used a questionnaire as the basis of the study. The questionnaire investigated five major factors that could impact a physician's ability to disclose medical errors. These factors were fear of disclosure, physician apology, organizational culture toward patient safety, professional ethics and transparency, and patient and physician education (Zaghloul et al., 2015). Although Zaghloul et al. (2015) showed that the five factors played a great role in physician's reluctance to admit errors, however, it had some limitations. Since the study was conducted in the United Arab Emirates (UAE), the result may have been impacted by local organizational and cultural norms.

We reused Zaghloul et al. questionnaire with two critical variations. First, we repeated the questionnaire in the U.S. to study any variation in results due to changes in organizational behavior and culture. Second, we limited collected responses to major mistakes only so that the effect of these variables on perceived barriers could be identified. The study was necessary because it could lead to having a better understanding of the reasons behind doctors' reluctance to report errors.

We reproduced the instrument in the U.S. to determine the variance in results that may be due to the influence of organizational and cultural norms and see the effects on physicians' perception. From there, it could be possible to develop strategies to alleviate barriers which hindered physician errors reporting. The reason for lessening barriers to errors reporting was that knowing how errors happened, physicians and health care institutions could take actions to correct these errors and prevent them from occurring, thus improving patient safety and fostering a culture of safety (Crane et al., 2015; Kachalia & Bates, 2014).

### **Statement of the Problem**

In the U.S., medical errors occurred frequently in hospitals (D'Errico et al., 2015; Guillod, 2013; Rafter et al., 2014). Belgian, Portuguese, and U.S. hospitals combined have shown that the median percentage of adverse events among hospital patients was 9.2% (Marquet et al., 2015; Sousa et al., 2014; Rafter et al., 2014; Zeeshan, Dembe, Seiber, & Bo, 2014). In the United States, these errors were responsible for the deaths of approximately 44,000 to 98,000 people annually (D'Errico et al., 2015; Wu, Boyle, Wallace, & Mazor, 2013). Patients and the public wanted errors to be disclosed, but many physicians or medical doctors were reluctant due to fear of legal actions and loss of trust (Anwer & Abu-Zaid, 2014; D'Errico et al., 2015). Although 90% of health care professionals have agreed to errors disclosure in a hypothetical situation, less than 40% disclosed mistakes when they happened, showing a mismatch between what was said and done (Anwer & Abu-Zaid, 2014; D'Errico et al., 2015).

Although 87% of physicians considered that it was a deontological and ethical duty to admit mistakes, only a few, 33% reported errors (D'Errico et al., 2015; Kachalia & Bates, 2014). Even though the Joint Commission mandate asked the hospitals to disclose medical errors and adverse events, conformity with this mandate has not been fully accomplished in U.S. hospitals

(D'Errico et al., 2015; Kachalia & Bates, 2014; Lipira & Gallagher, 2014). Despite years-long consideration of improving disclosing practices, a significant gap has existed between admission of errors and current practice (Lipira & Gallagher, 2014). The research problem was the organizational culture toward patient safety as a perceived barrier that hindered physicians' ability to report medical errors when they happened during the delivery of health care services in hospitals. The proposed study may begin to fill the gap in understanding factors which influenced physician disclosure of medical errors or challenges in reporting errors. The study sought to investigate the relationship between , organizational culture toward patient safety and physicians' readiness to disclose major medical errors. Dissemination of study findings may help inform health care administrators and policymakers about implementing policies and interventions which promote full disclosure of error as a critical element of quality care to enhance patient safety.

### **Research Purpose and Aims**

The purpose of this cross-sectional quantitative study was to determine and understand organizational culture toward patient safety as a perceived barrier affecting physicians' readiness to disclose major medical errors. A primary focus of health care has been to evaluate physicians' attitudes toward errors admission in order to improve a proper disclosure of error (Kalra, Kalra, & Baniak, 2013). To address organizational culture toward patient safety as a barrier to error disclosure, the study used a cross-sectional online and paper survey method to explore the relationship between organizational culture toward patient safety as a perceived barrier and doctors' willingness to disclose major medical mistakes. Organizational culture toward patient safety as a perceived barrier are measured as the independent variable and physicians' readiness to disclose major errors measured by Linthorst et al. questionnaire, is the dependent variable. Moreover, we used a paper-based survey because we did not have access to all participants' emails. The study aimed to address the gap in present literature which was identifying barriers impacting physicians' ability to report medical errors when they occurred.

### **Rationale for Research Method and Design**

A quantitative cross-sectional online survey method and paper questionnaire method were used to understand organizational culture toward patient safety as a factor that impacted physicians' disclosure of medical errors. The use of a quantitative design employing both a web and paper-based survey research methodology were appropriate for this study because the study sought to determine fundamental factors which prevented most physicians from reporting errors. Cross-sectional allowed for a comparison of different variables. In this case, the independent variable was organization culture toward patient safety, about the dependent variable physician willingness to disclose medical errors. Moreover, this design allowed for a consistent and steady collection of data.

Furthermore, the choice of a quantitative method was relevant as the technique allowed to measure the incidence of numerous opinions and views among physicians regarding disclosure of medical errors. Also, this method was useful in controlling for any bias so that the phenomenon of physicians' errors underreporting could be well understood in an unprejudiced way (Park & Park, 2016). Furthermore, the quantitative method allowed for a broader study and enhanced generalization of findings.

## Population

The study's target population consisted of physicians working in three community hospitals located in Iowa and Illinois. Hospital physicians' database combined had a list of more than 2,000 physicians from various specialties. The choice of this population was due to the fact that only physicians could provide the reasons behind their medical errors underreporting behaviors. For this purpose, we surveyed a sample of physicians working in these community hospitals. The sample size was determined through power analysis.

## Sampling and Sampling Procedures

A simple random sampling method was used to choose the sample for this study. This sampling strategy was commonly used in survey sampling, and it offered an equal chance for each participant to be included in the sample (Acharya, Prakash, Saxena, & Nigam, 2013; Frankfort-Nachmias & Nachmias, 2008; Tipton, 2013). This sampling technique was advantageous to reduce selection bias and contribute to improving generalization. The choice of this sampling strategy ensured a better representation of groups of physicians (Acharya et al., 2013).

The sample came from these hospitals database which contained a significant number of physicians. From the list, physicians were randomly selected. Researchers used different tools such as tables of random digits or computer programs to create random samples. In this study, we used Microsoft Excel, especially its RAND function to generate the sample. The choice of this function was based on the fact that it allowed the generation of numbers that were homogeneous and randomly distributed, and the technique was also reliable with simple random sampling (Allbright, Winston, & Zappe, 2009). After the data set was ready, we followed these steps to create the sample:

- Inserted a new column titled "Random number" in the worksheet.
- Typed "RAND()" in the first empty cell and
- Validated by pressing "Enter" and a cell with a random number showed up.
- Copied the formula and pasted it in other cells in the "Random \_number" column.
- Sorted the values in "Random number" column.
- Selected the first 129 physicians who corresponded to the sample size determined through power analysis.

## Sample Size

The determination of a sample size was critical in research as it defined how large or small the sample would be (Charan & Biswas, 2013; Fugard & Potts, 2015). The calculation of the sample size was determined using power analysis, and it took into consideration the effect size, alpha level, and power level (Fugard & Potts, 2015). Thus, to calculate the sample size for multiple linear regression, the input parameters included an alpha ( $\alpha$ ) level of 0.05, an effect size of 0.15, and a power analysis of 0.95. With these parameters, the power analysis tool found that the estimated sample size for this study was 129. G\*Power 3.1.9.2 was the tool used to calculate the sample size for this study.

The effect size, alpha and power levels chose were used in some studies cited in the literature review (Nevalainen, Kuikka, & Pitkala, 2014; Poorolajal, Rezaie, & Aghighi, 2015;



Tagaddosinejad et al., 2013). Effect size specified the extent of experiential effect or correlation among variables. The variables were important in research (Maher, Markey, & Ebert-May, 2013; Peng & Chen, 2014). In this study, setting power at 95% and alpha error probability at 0.05% were an indication that there was 5% probability of erroneously sustaining the null hypothesis and 95% chance of obtaining the response from physicians. Furthermore, the medium effect size of 0.15 have helped to measure the strength of the factors. For this study, the sample size was 129 respondents, after power analysis. The sample size  $n=129$  met the minimum requirement for effect size, even though 122 survey questionnaires were collected.

## **Instruments**

The survey instrument from Zaghloul, Elsergany, and Mosallam (2016)'s journal article was used in this study. The questionnaire was titled "A Measure of Barriers toward Medical Disclosure among Health Professionals in the United Arab Emirates." The license number for the questionnaire was 3942871027500. The license date was September 06, 2016. The licensed content publisher was Wolters Kluwer Health, Inc. There were 23 items in the questionnaire divided into five domains. The five domains were image consequences, patient safety, apology, professional ethics and transparency, and patient and physician education. The questionnaire also included the items for physicians' readiness to report major medical errors.

There were ten items for fear of disclosure (item 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17). There were four items for organizational culture toward patient safety (item 6, 21, 22, and 23). There were three items for physician apology (item 18, 19, and 20). There were three items for professional ethics and transparency (item 1, 2, and 3). There were three items for patient and physician education (item 4, 5, and 7). All items in the questionnaire were rated using a 5-point Likert scale; 1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 =strongly agree for the independent variables. This questionnaire is attached in Appendix B.

Also, there were four items related to physicians' readiness to report medical errors (item 24, 25, 26, and 27). The questionnaire was titled "Internists Willingness to Disclose Medical Errors Questionnaire" (Linthorst et al., 2012). Three items were not analyzed in this study. Only one item which was item 26 was analyzed in this study. Item 26 served to measure medical physicians' disclosure of errors and near misses. Item 26 was measured on a Likert Scale; 1 represented probably not, 2 represented probably, 3 represented certainly, and 4 represented certainly not. The purpose of the questionnaire was to understand physicians' perspectives on the issues of medical errors disclosure.

## **Research Question / Hypothesis**

One research question and one hypothesis guided the study:

*RQ1:* What are the most critical perceived barriers affecting physicians' readiness to disclose major medical errors?

*H<sub>0</sub>:* Physicians' readiness to report major medical errors are not related to organizational culture toward patient safety.

*H<sub>a</sub>:* Physicians' readiness to report major medical errors are related to organizational culture toward patient safety.

## Statistical Tests

The independent variable was organizational culture toward patient safety. The dependent variable was physician willingness to disclose major medical error. Multiple linear regression tests were performed to determine the factors which predicted medical errors reporting. Statistical significance was set at alpha ( $\alpha$ ) = 0.05. Descriptive statistics was conducted to summarize and analyze the demographic data. The inclusion of potential covariates was not completed and there was no evidence that other variables such as year of experience and specialty type could influence physician reporting behavior. The interpretation of test results was based on the parameters inputs such as alpha = 0.05, effect size = 0.15, and confidence level at 95%.

## Critical Review of the Literature

The development of a culture of safety in hospitals was central to the achievement and improvement of patient safety initiatives and care quality (Jones & O'Connor, 2016; Weaver et al., 2013). Weaver et al. (2013) wrote that the existence of a culture of safety has contributed to shaping healthcare professionals and clinicians' perception of normal behaviors associated with patient safety. They also recognized that a culture of safety informed physicians' awareness about what was commendable and what was indictable. Thus, a culture of safety impacted a clinician's enthusiasm to involve in safe behaviors (Weaver et al., 2013). For a culture of safety to influence and provide exceedingly consistent and safe care, it must rely on three predominant principles such as trust, reporting, and improvement (Tsao & Browne, 2015). The presence of these principles may allow clinicians to trust their organization, regularly report errors to learn from their mistakes and improve (Tsao & Browne, 2015). But, health care organizations need to hold their doctors accountable to the observance of safety protocols and measures to sustain a high degree of consistency and trust (Tsao & Browne, 2015).

While researchers have agreed that a culture of safety was the cornerstone of quality care, they did offer different perspectives on the components and principles of a culture of safety. Weaver et al. (2013) suggested that culture of safety needed to be based on trust, reporting, and improvement. Nevertheless, Ulrich and Kear (2014) contended that a culture of safety must include three critical elements such as learning culture, just culture, and reporting culture. A just culture in which fairness and accountability were important elements defined what was acceptable and unacceptable whereas a reporting culture empowered and facilitated errors reporting. A learning culture offered the opportunity to learn from errors and safety events (Ulrich & Kear, 2014). These three elements were connected because without a just culture; there would be less reporting; without error disclosure, physicians would have no prospect to learn from their mistakes and improve. Ulrich and Kear (2014) assertion could also explain the actual underreporting gap because the lack of a culture of safety in a health care organization could cause underreporting of errors (Kagan & Barnoy, 2013).

Kagan and Barnoy (2013) asserted that the way culture of safety was implemented in a health care organization influenced physicians' patient safety behaviors and medical error reporting. For the safety culture to impact physicians' behaviors, there needed to be a positive climate within the health care organization. With this kind of positive working environment, doctors would be able to ask questions when they come across something they do not understand (Kagan & Barnoy, 2013). It was obvious that a health care organization's environment that was prone to a culture of safety may be favorable to physicians regarding errors reporting, and that

could lead to an improvement in patient care (Hemingway, O'Malley, & Silvestri, 2015). In contrast, the absence of a culture of safety could hinder the implementation of patient safety mechanism and discouraged physicians' mistake reporting (Lee, Yang, & Chen, 2015). Therefore, the lack of a culture of safety could explain in part physicians' underreporting behaviors and could constitute an important factor that has impacted doctors' decision-making process.

Ulrich and Kear (2014) demonstrated that a culture of safety was related to doctors' behaviors such as disclosing adverse events. Their research conducted in 37 states indicated that a higher safety performance in hospitals was associated with a higher level of a culture of safety. This finding was the indication that health care organizations and leaders need to devote sufficient time and efforts to implement a culture of safety in their institutions. The reason for adopting a culture of safety in all hospitals was that a culture of safety influences physicians' errors reporting and personal views (Kagan & Barnoy, 2013). When physicians found the error-handling procedure to be appropriate and had all the safety information available, they would become more likely to engage in patient safety behaviors such as reporting errors (Kagan & Barnoy, 2013).

Kagan and Barnoy (2013) used the example of a study conducted in Israel to investigate the correlation between the culture of safety and error reporting the incidence to assert organizational culture of safety which influenced physicians' reporting behaviors. They stated that their conclusions were consistent with previous studies that found a similar relationship between an organizational culture of safety and nurses' reporting behaviors. As Kagan and Barnoy (2013) pointed out, the implications for healthcare organizations were to make a significant influence on the expansion of a culture of safety through the creation and promotion of a vision and strategy for safety and quality. Ulrich and Kear (2014) shared Kagan and Barnoy's vision by calling on healthcare executives to promote a culture of safety.

Abdi, Delgoshaei, Ravaghi, Abbasi, and Heyrani (2015) recognized that ensuring patient safety was a high priority in hospitals. It was because patient safety formed the underpinning of healthcare delivery (Ulrich & Kear, 2014). However, achieving patient safety formed the basis for the creation of a culture of safety that was suggested as an important strategy to improve patient safety (Abdi et al., 2015). Moreover, the creation of a culture of safety which prohibited the blame and punitive culture would make physicians feel more comfortable in reporting errors while sustaining professional accountability (Abdi et al., 2015). In fact, per Abdi et al. (2015), the adoption of a culture of safety in hospitals contributed to increasing errors reporting. Kagan and Barnoy (2013) supported Abdi et al. (2015) findings by acknowledging the existence of a positive correlation between a culture of safety and physicians' reporting behaviors. From this perspective, it was obvious that a healthcare organization with a positive culture of safety could learn from medical errors and proactively changed the causal systems to prevent mistakes from happening instead of blaming or punishing the perpetrator (Abdi et al., 2015).

Nie et al. (2013) contended that the IOM report "To Err is Human: Building a Safer Health System" reasoned for the development of a safety culture in which medical errors can be disclosed without any blame. While Nie et al. (2013) recognized the importance of safety culture, they also alleged that the existence of patient safety culture has promoted patient safety and has helped to enhance patient safety standards. There was no doubt that the implication of this finding for healthcare organization has contributed to the development of a safety culture to promote quality care and ensure patients' safety. Hemingway et al. (2015) agreed with this assertion and suggested that healthcare organizations and professionals including physicians

must commit to a culture of safety which was indispensable to improve quality care and avoid medical errors. Moreover, patient safety culture was seen as an indispensable tool to direct doctors' voluntary behaviors toward seeing patient safety as a high priority (Fujita et al., 2013).

### Theoretical Framework

The theory of TPB and Kant's deontological theory grounded this research.

#### Theory of Planned Behavior

The TPB was developed to predict and explain individuals' behaviors and intentions. The model linked and individual beliefs and behavior (Ajzen, 1991; Finke, Hickerson, McLaughlina, Nippold, & Camarata, 2015). The theory suggested that a person's intention to engage in behavior was determined by three predictors: Attitude toward the behavior, subjective norm, and perceived behavior control (Ajzen, 1991; Finke et al., 2015). The combination of these three predictors led to the development of a behavioral intention (Javadi, Kadkhodae, Yaghoubi, Maroufi, & Shams, 2013). In fact, TPB linked beliefs and behaviors by using intent to predict behavior (see Figure 1).

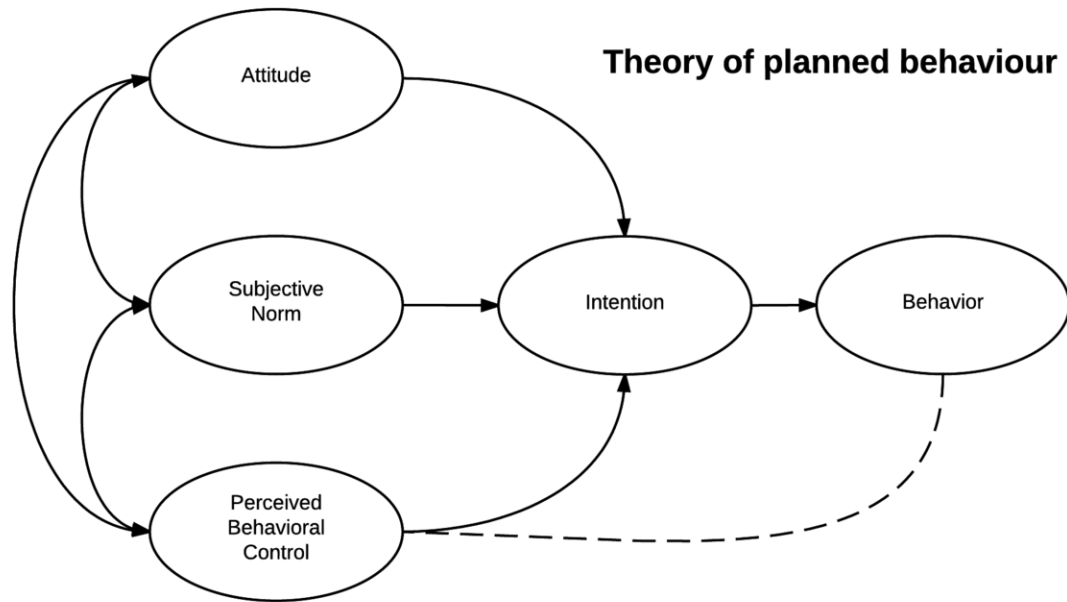


Figure 1. Model of TPB

Even though other variables may affect behavior, it was evident that human action was most precisely predicted by the fundamental determinants of attitude, subjective norm, and perceived behavioral control (Lapkin, Levett-Jones, & Gilligan, 2015). According to the TPB, attitude referred to a person's favorable or unfavorable dispositions when performing a precise behavior, while subjective norm referred to the perception about how other people would judge a person for executing an indicated behavior (Lapkin et al., 2015). Perceived behavioral control indicated the assessment of a person's competence to accomplish a chosen behavior (Lapkin et al., 2015). The supposition behind the TBP was that combining these variables offered a clear perception of individuals' behavioral intentions (Lapkin et al., 2015). The more favorable the attitude and subjective norm, the greater the perceived control. Resiliency depended on the individual's intention to accomplish the behavior in question (Javadi et al., 2013; Lapkin et al.,

2015). Given an appropriate level of actual control over the behavior, people were likely to complete their intentions when the prospect arose (Javadi et al., 2013; Lapkin et al., 2015).

The TPB has been used in health care and health-related fields to understand the factors that influenced physicians and nurses' patient safety associated with behaviors (Finke et al., 2015; Javadi et al., 2013). The TPB was suitable for this study because the theory was previously used to explain physicians' attitudes and behaviors regarding medical errors reporting (Finke et al., 2015). It was also relevant in the way that the intent to report an error may have been swayed by other factors such as malpractice lawsuits, loss of professional reputation, and loss of patient trust that may lead to non-reporting behaviors (Hutchinson, Sales, Brotto, & Bucknall, 2015).

### **Kant's Deontological Theory**

Kant's deontological theory was one of the five ethical theories that also included utilitarianism, casuist, virtue, and rights theories. Deontology "emphasized the obligation of an individual to adhere to universal moral rules, principle to determine moral behavior" (Xu & Ma, 2016, p. 538). Kant focused on a duty-based theory or ethics that inferred truth telling, doing good for people, respecting individual autonomy, and doing no harm (Ghazal, Saleem, & Amlani, 2014; Reddy & Mythri, 2016). The morality of an action is measured by its observance of the rules (AlArbeed & AlHakim, 2015; Pinar & Peksoy, 2016). For Kant, physicians' compliance with the regulations remained a means to provide equal treatment to every patient (Al Arbeed & Al Hakim, 2015).

Kant's deontological theory has been used in health care training and education for helping physicians and care professionals in reaching an ethical decision in their practices (Pinar & Peksoy, 2016). The deontological theory has been significant in the expansion of bioethical theory to guide doctors and health care professionals' moral behaviors (Ghazal et al., 2014). The theory was appropriate for this study because of the ethical implications of physicians' decision regarding errors disclosure.

### **Potential Significance of the Study**

Medical errors frequently happened at a high rate in U.S. hospitals (D'Errico et al., 2015; Guillod, 2013). When these mistakes happened, some doctors chose not to disclose them to patients and their families (Anwer & Abu-Zaid, 2014; D'Errico et al., 2015). This research aimed to fill a gap in understanding barriers to medical mistakes reporting by focusing on factors that influenced physicians' disclosure of medical errors. This study was significant as the findings would help health care organizations adopt and promote patient safety culture.

Though medical errors cause approximately 44,000 to 98,000 deaths annually in the United States, they also had a financial cost (Bonney, 2014; D'Errico et al., 2015; Guilod, 2013; IOM, 1999; Kalra et al., 2013). According to Kalra et al. (2013), forty-five cents of each dollar paid out in the U.S. were connected to medical errors. The median cost per error has risen from \$892 in 2008 to \$939 in 2009 (David, Gunnarson, Waters, Horblyuk, & Kaplan, 2013). Furthermore, the annual cost of medical mistakes reached \$17 billion in 2009 (Kalra et al., 2013). It was evident that these skyrocketing costs due to medical errors affected existing human capital and financial resources. These funds could be used for investing in new technologies to prevent medical mistakes or training physicians on how to disclose mistakes.

Study findings would help understand the reasons behind physicians' medical errors and underreporting behaviors. Insights gained from this study would help inform care organizations to develop and implement policies for full disclosure of mistakes and change the culture of professionalism to a culture of safety. The development of a culture of safety would contribute to changing doctors' behaviors and attitudes from fear and defensiveness about what went wrong in the delivery of care to an attitude of honesty and a willingness to learn (Guillod, 2013). The change in doctors' attitudes would be beneficial to them and patients who wanted to know the truth, which would prevent the patients from engaging in legal actions because they sought explanations and apologies rather than financial compensation (Guillod, 2013). Understanding physicians' stance on disclosure of errors may move health care organizations to develop a mechanism to support physicians and adopt a full disclosure policy as well as a culture of safety for the best interests of the American society.

This study may contribute to social change by helping health care organizations in implementing safety culture policies which would encourage physicians to report medical errors. Through errors reporting, physicians would learn from their mistakes and be keen to avoid repeating the same mistakes. This practice would contribute to enhancing patient safety that is *sine qua non* of quality care.

### **Contribution to Healthcare Practice**

Study findings have some implications for professional practice. Healthcare leaders can use the results to design strategies aiming at improving errors reporting. The results can also be useful in tailoring physicians medical error disclosure training.

The results of this study point to the future direction in which doctors were affected by various concerns. Therefore, it is important for health leaders to use the findings to address physicians' concerns. Through this healthcare leaders can get a better idea of how to implement strategies to create an organizational culture that enhances patient safety.

### **Reliability and Validity**

The main threat to external validity was selection bias. In order to avert the selection bias in this study, the researcher used a simple random sampling method. This strategy helped to ensure a better representation of the participants and improve generalizability of the findings. Thus, in terms of external validity, this study might be generalized to all physicians working in the community hospitals.

A threat to internal validity occurred when the instrument did not have satisfactory reliability (Melnik & Morrison-Beedy, 2012). Discrepancies in the instrument could lead to inaccurate answers that would affect the research results. Thus, to avoid this instrumentation bias, we made sure the questionnaire was reliable and the questions properly labelled. In the case of this study, the questionnaire has been found to be reliable and valid with a Cronbach alpha of 0.65 and 0.62.

The study has both external and internal validity. The validity was due to the implementation of the study regarding strict IRB protocols, utilization of study instruments, data collection process, data entry process, and data analysis. The data was entered two times to ensure data results accuracy.

## Presentation of Findings

### Demographics

**Table 1**

*Gender of Study Participants*

	Frequency
Female	37
Male	85
Total	122

Table 1 showed that 37 female and 85 male physicians participated in the study.

**Table 2**

*Education of Study Participants*

	Frequency
Bachelor	1 <sup>a</sup>
Postgraduate	121
Total	122

- a. This participant with a bachelor's degree was allowed to practice as a doctor.

According to Table 2, there was only one study participant who received bachelor's degree. 121 study participants received postgraduate degrees.

**Table 3***Specialty of Study Participants*

Specialty	Frequency
Not Specified	4
Anesthesiology	1
Cardiology	7
Critical Care	8
Electrophysiology	1
Emergency Medicine	16
Endocrinology	1
Family Medicine	7
General Surgery	15
Infectious Disease	1
Internal Medicine	12
Neurological Surgery	1
OB-GYN	14
Oncology	6
Pathology	1
Pediatrics	11
Physical Medicine & Rehabilitation	1
Primary Care	1
Family Practice	12
Psychiatry	1
Urgent Care	1
Total	122

Table 3 depicted study participants' specialty. It revealed that physicians who took the survey came from various specialty. However, the dominant specialties were emergency medicine, general surgery, OB-GYN, internal medicine, family practice, and pediatrics.

Table 4 showed there was a significant relationship between patient safety and physician readiness to report major medical mistakes. The p value was 0.50 ( $p < 0.05$ ).



**Table 4**

*Multiple Linear Regression of Relationship Between Patient Safety and Physician' Readiness to Disclose Major Medical Mistakes*

	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	38.858 <sup>a</sup>	75	.518	1.598	.050
Intercept	1906.568	1	1906.568	5880.725	.000
Question_6	.295	4	.074	.228	.921
Question_21	1.381	4	.345	1.065	.386
Question_22	.989	3	.330	1.017	.395
Question_23	3.049	3	1.016	3.135	.035
Question_6*	6.772	10	.677	2.089	.049
Question_21					
Question_6*	2.088	6	.348	1.074	.394
Question_22					
Question_6	2.052	5	.410	1.266	.297
Question_23					
Question_21*	3.282	8	.410	1.266	.287
Question_22					
Question_21*	2.749	8	.344	1.060	.409
Question_23					
Question_22*	6.687	5	1.337	4.125	.004
Question_23					
Question_6*	1.268	1	1.268	3.910	.055
Question_21*					
Question_22					
Question_6*	2.046	2	1.023	3.156	.053
Question_21*					
Question_23					
Question_6*	.000	0	.	.	.
Question_22*					
Question_23					
Question_21*	.000	0	.	.	.
Question_22*					
Question_23					
	.000	0	.	.	.
Question_6*					
Question_21*					
Question_22*					
Question_23					
Error	13.617	42	.324		
Total	6526.000	118			
Corrected Total	52.475	117			

a. R Squared = .741 (Adjusted R Squared = .277)

We found that a lack of an organizational culture that did not emphasize transparency and patient safety hinder doctor's ability to report medical mistakes. This finding was consistent with Kagan and Barnoy (2013), who found that the absence of a culture of safety in a healthcare organization culture could cause underreporting of errors. Lee et al. (2015) also found that the lack of a culture of safety that is part of a hospital culture could hinder implementation of patient safety mechanisms and as a result discourage physicians' reporting. Moreover, the finding was consistent with Ammouri et al. (2015) who contended that patient safety was central to healthcare quality because a good organizational culture could lead to a safer environment. Thus, achieving patient safety required healthcare leaders to move from a punitive culture to patient safety culture that facilitated openness (Ulrich & Kear, 2014).

### **Recommendations for Action**

In this study, we used a cross-sectional quantitative methodology to examine the association between the independent variables organizational culture toward patient safety and the dependent variable of physician's readiness to disclose major medical error. The results showed that the association was statistically significant between the independent and dependent variables. For future studies, a longitudinal design should be used to evaluate barriers affecting physicians' readiness to report medical errors. A longitudinal method can be used to detect and follow change over time in physician's attitude regarding error disclosure.

To have an in-depth understanding of barriers impacting doctors' ability to disclose errors, we would recommend qualitative research. Through face-to-face interviews and focus group, researchers can be able to explore physicians' perception as to how factors such as organizational culture toward patient safety, physician apology, professional ethics influence their reporting behavior.

Researchers should also examine the association between physicians' error reporting training and physicians' readiness to report medical errors across U.S. hospitals and clinics. Given my findings, we recommend that the medical field focus in awareness education regarding medical errors disclosure among physicians and doctors. Moreover, more research is needed to confirm the results of this study.

### **Conclusion**

Medical errors were serious threats to patient safety. Across the world and in the United States, medical mistakes frequently occurred at a high rate in hospitals, nursing homes, and other healthcare settings. These mistakes should be reported when they happened. However, physicians chose to go against their professional obligation and the Joint Commission mandate. Thus, the necessity arose to study the issue by determining perceived barriers affecting doctors' ability to report medical errors.

To understand the problem, we conducted a cross-sectional study. Data were collected and analyzed using SPSS. Statistical analyses showed that organizational culture toward patient safety was significant. It was one of the primary barriers impacting physicians' willingness to report errors. The findings were consistent with the literature that lack of a culture of safety, apology knowledge, and adequate training impeded physicians' ability to report (Hannawa et al., 2016; Alsafi et al., 2015; Nabilou et al., 2015).

The research findings provided evidence that healthcare leaders need to take actions to mitigate effects of these barriers on doctors' aptitude to disclose medical mistakes. Healthcare leaders can use the results to design mechanism facilitating error disclosure. The results can also serve as the basis for creating an organizational culture that predominantly favors safety culture. Implementing safety culture policies would open the door to physicians to speak up. Through error reporting, doctors may contribute to enhancing patient safety.

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Key words: Medical errors, physician readiness, organizational culture, patient safety, theory of planned behavior, Kant deontological theory.

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