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Original Article

Patient Safety Behavior in Physicians: How is it Predicted?

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Abstract

Background: Patient safety is a serious global public health issue. Estimates show that every day many patients are harmed while receiving hospital care. Health care staff plays a key role in providing quality and safe patient care, especially physicians who are main members of the medical team and a critical element in patient safety efforts.
Objective: The current study used a Theory of Planned Behavior (TPB) framework to investigate predictors of patient safety intentions and behavior of physicians.
Methods: This descriptive analytical study was conducted in 8 hospitals with 52 physicians participating. A researcher-designed questionnaire was prepared to investigate patient safety behaviors and behavior constructs of physicians based on the guidelines of constructing a TPB Questionnaire: Conceptual and Methodological Considerations. The content validity and reliability of the questionnaire were confirmed. Binary logistic regression analysis was performed using $SPSS_{18}$.
Results: The total mean score of physician safety behavior indicated that 3.8±0.92. 42% of physicians reported their safety behavior at a good level. There was no significant difference between the patient safety function of physicians in public and private hospitals (P=0.8) and working in medical or surgical wards (P=0.4). Among TPB constructs, "normative beliefs" had the greatest influence on physician intention for safety behaviors (wald=3.828, P=0.05).
Conclusion: The results showed that "normative beliefs" had the greatest influence on physician intention for safety behaviors; therefore, it seems that patient safety must be the most important concern of all health care staff, specifically managers and executives throughout health care centers.

Keywords: Patient Safety, Physicians, Behavior, Hospitals

1. Background

Patient safety is a serious global public health issue. Estimates show that every day many patients are harmed while receiving hospital care [1, 2]. In recent years, patient safety has increasingly become a priority issue for health care systems. A variety of plans and activities have been considered for overcoming the most prominent hazards for patients while receiving health care [3]. Health care staff play key roles in the quality and safety of patient care, especially physicians who are main members of the medical team and a critical element in patient safety efforts [4]. Thus, ways of thinking and acting about patient safety are important issues. Physicians believe that there are many obstacles to patient safety such as the lack of resources, lack of patient awareness, poor communication, etc. [5]. In addition, physicians have the attitude that bad things can't happen to them; they view catastrophic events as rare and assume everything is safe [4]. Conversely, medical error rates have been quoted in the level of 5-15% per hospital admission in the developed world. Information about the overall state of patient safety in developing countries is less well known due to the shortage of data [6].

Based on the viewpoints of experts, one challenging task in improving safety of care is successfully engaging physicians [7]. Classen mentioned that an effective alternative for improving safety in health care is to engage and integrate physicians in safety efforts [8]. One of the factors affecting patient safety is the behavior of the medical staff. It could be said that patient safety is dependent on how health care workers act. It is also obvious that decision-making for specific behaviors are influenced by psychological content, i.e. psychosocial variables influence human behaviors [9, 10]; or, in other words, decision-making for specific behaviors are influenced by psychological issues. One of the most reasonable theories yet suggested for demonstrating human behavior is the theory of planned behavior (TPB). According to TPB, human action is guided by three considerations: beliefs about the likely outcomes of the behavior and the evaluation of these outcomes (behavioral beliefs), beliefs about the normative expectations of others and motivation to comply with these expectations (normative beliefs), and beliefs about the presence of factors that may facilitate or impede performance of the behavior, and the perceived power of these factors (control beliefs) [11]. In their respective aggregates, behavioral beliefs produce a favorable or unfavorable attitude towards the behavior; normative beliefs result in perceived social pressure or subjective norms; and control beliefs give rise to perceived behavioral control. In combination, attitude toward the behavior, subjective norm, and perception of behavioral control lead to the formation of a behavioral intention. As a general rule, the more favorable the attitude and subjective norm and the greater the perceived control are, the stronger the person's intention to perform the behavior in question will be. Finally, given a sufficient degree of actual control over the behavior, people are expected to carry out their intentions when the opportunity

arises. Intention is thus assumed to be the immediate antecedent of behavior. However, because many behaviors pose difficulties of execution that may limit volitional control, it is useful to consider perceived behavioral control in addition to intention. To the extent that perceived behavioral control is veridical, it can serve as a proxy for actual control and contribute to the prediction of the behavior in question. Figure 1 is a schematic representation of this theory [12].

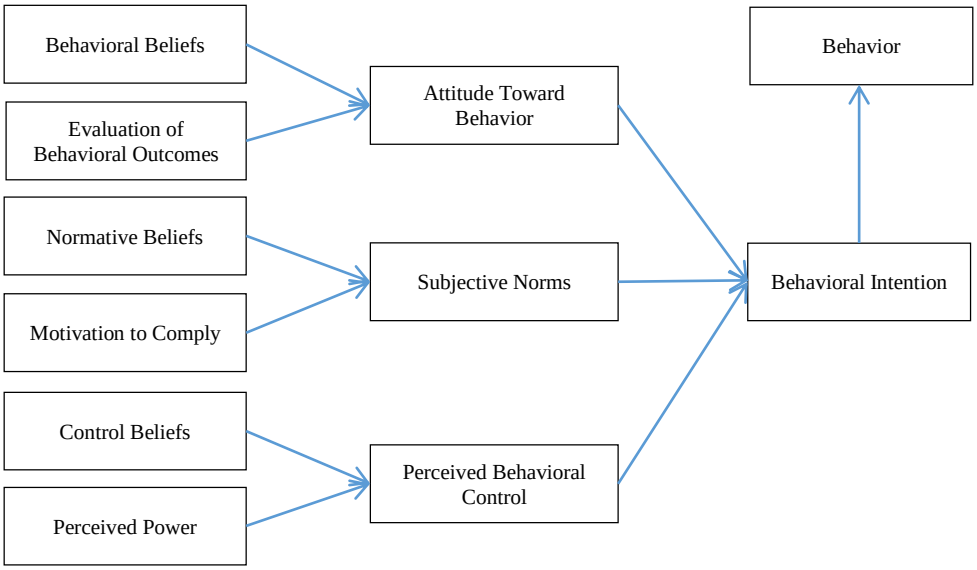

Figure 1. Schematic representation of the theory of planned behavior

It is known that the theory of planned behavior is a well-validated behavioral decision-making model that has been used to predict social and health behaviors [13].

This model has been widely applied to health-related fields throughout the world.

In an interventional study to investigate applying TPB on the behavior of eating breakfast, Ghalipour concluded that using TPB improved students' intentions and behavior of eating breakfast [14].

In another study conducted by Talbot et al. to explore the impact of TPB on the intention of caring for patients with alcohol dependence in a population of enrolled nursing students, researchers concluded that subjective norms were the strongest predictor of intention to care for patients with alcohol dependence [15].

In Iran, there has recently been a growing interest in patient safety initiatives, and considerable efforts have been taken to achieve them, although there is a long road ahead toward this goal [16].

2. Objective

The current study aimed to investigate predictors of physicians' patient safety intentions and behaviors using a TPB framework.

3. Methods

Fifty-two physicians with up to two years of work in Isfahan hospitals participated in this descriptive analytical study. Eight hospitals (4 public and 4 private) were randomly selected. In order to provide the possibility of comparing results by hospital type and workplace situation, samples were selected through stratified sampling from public and private hospitals and also within each hospital from medical and surgical wards or intensive care units. The number of subjects in each hospital was calculated based on its proportional population, and they were selected using the random sampling method. A researcher-designed questionnaire was prepared to investigate patient safety behaviors and behavior constructs of physicians based on the guidelines of Constructing a TPB Questionnaire: Conceptual and Methodological Considerations [12].

The mentioned instruction provides a guidance for the researcher to construct a questionnaire suitable for the behavior and population of interest. Regarding the samples provided in that instruction, patient safety behavior components were constructed. The questionnaire was primarily designed by a team of researchers including 3 nurses, 1 physician, and 1 psychologist. The initial draft was circulated to several experts of patient safety in the fields of nursing, medicine, health care administration, and psychology; then it was reviewed and modified by the research team. Content validity of the questionnaire was evaluated through the qualitative approach. Then, the final questionnaire was circulated among experts, their opinions were attained, and after a final revision were returned to the experts for confirmation. The internal consistency (reliability) of the questionnaire was assessed by Cronbach's alpha coefficient using a sample consisting of 20 randomly-selected nurses and physicians as 0.87.

The questionnaire consisted of a total of 65 questions and included two parts. The first part included 10 questions addressing the independent variable, i.e. patient safety behaviors, which were measured as self-reported. The second part included 56 questions addressing dependent variables, i.e. TPB constructs. All variables of the study were rated on a Likert scale anchored from strongly disagree (1) to strongly agree (5) for each of the 55 items. The variable scores of normative beliefs (4 items), control beliefs (6 items), power of control factors (6 items), behavioral beliefs (10 items), motivation to comply (4 items), perceived behavior, subjective norms, attitude and intention (15 items), outcome evaluation (10 items) were determined by calculating a mean score of all statements related to each of the above variables.

To facilitate score calculation, the 0-5 scale was converted to a 0-100 Likert scale. Binary logistic regression

analysis was performed to evaluate how well each TPB variable predicted the variance in patient safety behavior. For applying binary logistic regression, the values of the dependent variables were recoded as values > 70 (high level safety behavior) and values < 70 (low level safety behaviors). Data was analyzed with SPSS version 18. Descriptive statistics were used in order to describe the quantitative variables and the student's t-test was used to analyze the data.

4. Results

Results of this study showed that 52 physicians completed the questionnaire, from which 19 (36.5%) worked in surgical wards and 33 (63.5%) in medical wards. Total mean score of safety behavior of physicians was reported as 3.8±0.92 and, as shown in Table 1, 42% of physicians reported their safety behavior as being at a good level.

Calculating physicians mean scores in each variable of TPB indicated that respondents attained higher scores in the areas of perceived behavioral control, subjective norm, attitude, and intention (81.97±16.5) (Table 2).

In another part of this study, the self-reported patient safety functions of physicians in public and private hospitals and occupation in wards were compared. The results indicated no significant difference between patient safety function of physicians in public and private hospitals (P=0.8) and working in medical or surgical wards (P=0.4) (Table 3).

As evident from Table 4, calculating the binary logistic regression indicated that "normative beliefs" had the greatest influence on physicians intention for safety behaviors (wald=3.828, P=0.05).

Table 1. Frequency and mean scores of self-reporting safety behaviors in physicians

Performance Score (out of 100)	Frequency	Percent	Mean±SD
1-very weak (0-20)	1	1.9	3.8±0.92
2-weak (20-40)	2	3.8	
3-Moderate (40-60)	13	25	
4-Good (60-80)	22	42.3	
5-Excellent (80-100)	14	26.9	
Total	**52**	**100**	

Table 2. Mean and SD of independent variables (TPB constructs) in physicians

Variables of TPB	Mean (Out of 100)	SD
Outcome evaluation	72.40	17.21
Perceived behavioral control, subjective norm, attitude, and intention	81.97	16.59
Motivation to comply	75.96	17.25
Behavioral beliefs	66.87	15.73
Power of control factors	64.74	22.45
Normative beliefs	68.62	29.06
Control beliefs	66.98	19.97

Table 3. Comparison of self-reported patient safety functions of physicians in public/private hospitals and occupation in medical/surgical wards

Hospitals, Wards	Mean	SD	t	P value
Public	64.4	18.3	-1.7	0.8
Private	74	14.4		
Surgical	69.29	17.4	0.6	0.4
Medical	65.14	18.05		

Table 4. Impact of variables of TPB on safety behavior intention of physicians (all respondents). Result of binary logistic regression

Variables of TPB	Sig	OR	Wald	B
Outcome evaluation	0.835	1.009	0.043	0.009
Perceived behavioral control, subjective norm, attitude, and intention	0.824	1.016	0.050	0.016
Motivation to comply	0.984	0.999	0.000	-0.001
Control beliefs	0.865	0.992	0.029	-0.008
Power of control factors	0.154	0.936	2.028	-0.066
Normative beliefs	0.050	1.038	3.828	0.038
Behavioral beliefs	0.246	1.053	1.347	0.052

5. Discussion

The results of the current study showed that the mean score of physicians' self-reported safety behaviors was reported as 3.8±0.92 (out of 5), and 42% of physicians reported their safety behavior at a good level.

Patient safety and clinical outcome are the most important issues in health care systems today. They are influenced by different variables, such as the work place, complexity of procedures, managerial systems, fatigue, workload [17, 18], communication [19], etc.

Yaghoubi mentioned that the method of communicating and interacting with patients affects patient satisfaction, treatment outcomes, medical costs, clinical competence, and even complaints [19].

In another study, Stuker pointed out that physicians believe bad things can't happen to them; they usually assume everything is safe [4]. However, reports of many organizations have announced that medical error is a critical issue in health care centers. The Institute of Medicine has reported 44,000 to 98,000 deaths per year due to serious medical errors in the United States alone [20].

Generally, the underreporting of medical errors is a challenge for health service centers, and it is necessary to understand its causative factors [21].

In this study, the mean scores of physicians in each TPB variable indicated that respondents attained higher scores in perceived behavioral control and its subsequences (81.97±16.5).

In the Ajzen model, control beliefs were defined as beliefs about the presence of factors that may facilitate or impede performance of the behavior and the perceived power of these factors; control beliefs give rise to perceived behavioral control [12].

In another part, this study compared self-reported patient safety functions of physicians in public and private hospitals, and the results indicated that there was no significant difference between patient safety function of physicians in public and private hospitals (P=0.8).

Policy makers and managers throughout the world may claim that there is no difference or disparity in safety between the private and public sectors, but evidence suggests differently. A study conducted in Uganda to compare rates of patient safety events by payer indicated that Medicare and Medicaid patients experienced significantly more adverse safety events than private pay patients [22].

Another study indicated that private insurance is associated with lower mortality, shorter lengths of stay, and improved clinical outcomes [23]. It seems that patients with higher financial capabilities who can be hospitalized in private hospitals have a generally higher safety rate.

Self-reported patient safety functions of physicians by ward occupation were also analyzed. The results indicated that there was no significant difference between patient

safety function of physicians working in either the medical or surgical ward (P=0.4). This finding is in controversy with many other evidences. Another study conducted in Iran reported that, among various units of a hospital, the highest frequency of medical error was related to surgical units [24].

In another study, Pugel pointed out that among the complications occurring within the hospital setting, more than half are associated with surgical procedures [25]. In this concern, WHO has mentioned that, although rates of death and complications after surgery are difficult to compare and document, hese rates in developed countries have been documented to occur in 3–22% of inpatient surgical procedures, and the death rate is 0.4–0.8%. In developing countries a death rate of 5–10% was reported as being associated with major surgery [26].

There is much evidence that surgical, intensive care, and emergency departments are potentially more hazardous because of the complexity and diversity of activities in these units. As many safety experts believe, systems that are more complex and tightly coupled are more prone to accidents [17, 18]. With this evidence in mind, therefore, it seems that physicians overestimate their safety behaviors.

As evident from Table 5, calculating the binary logistic regression indicated that "normative beliefs" had the greatest influence on physicians' intention for safety behaviors (wald=3.828, P=0.05).

According to TPB, one of three kinds of considerations which guides human action is normative beliefs (beliefs about the normative expectations of others and motivation to comply with these expectations); normative beliefs result in perceived social pressure or subjective norm (9, 10). These findings are consistent with those reported by Pooreh (2015) who concluded that the studied students who perceived more expectations from persons who were important to them (subjective norm) had healthy nutritional behaviors [27].

However, these findings contradict those reported by Faqah (2015) who mentioned that perceived behavioral control was the most influential factor in determining intention of blood donation [28].

6. Conclusion

The results of binary logistic regression showed that "normative beliefs" had the greatest influence on physicians' intention for safety behaviors; therefore, it is suggested that managers and executives in different departments and wards become more sensitive to patient safety issues. In other words, patient safety must be the most important concern of all staff, specifically managers throughout health care centers.

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Authors' Contributions

The concepts, design and the definitions of the intellectual content were done by MJ, literature search by MY, data acquisition by MJ, data analysis by MJ and MY, manuscript preparation by MY, MJ and SK, manuscript editing by MY, SK, and manuscript review by MJ and EE.

Conflict of Interest

No conflict of interest has been declared by the authors.

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