



Investigating the Predictive Role of the Safety Climate on Professional Behavior in Nurses Working in Hospitals Affiliated to Bushehr University of Medical Sciences

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Abstract

Background: The safety climate, which is a subset of the organizational climate in the field of safety, mirrors the attitudes of those involved in care centers towards safety. In addition to being in connection with diverse parts of the organization's function, the safety climate can also affect the nurses' performance. The present study aimed at investigating the predictive role of the safety climate on professional behavior among nurses working in the hospitals affiliated to Bushehr University of Medical Sciences.

Methods: In this descriptive-analytical study, which uses the cross-sectional design, 595 expert nurses participated who had at least 6 months of experience and were employed in the wards of the hospitals affiliated to Bushehr University of Medical Sciences. The data was collected from the nurses revolving around their viewpoints, which were determined using a demographic information form, professional behavior scale and safety climate questionnaire.

Results: Among the diverse domains of the safety climate, the field of nursing education ($p=0.027$, $\beta=0.104$), communication with other nurses ($p=0.027$, $\beta=0.101$) and error reporting ($p<0.001$, $\beta=0.191$) were the direct predictors of professional nursing behavior. Also, apart from the safety climate, satisfaction with nursing as a job had a direct, statistic and significant relationship with professional behavior ($p<0.001$, $\beta=0.142$).

Conclusion: This study found that most of the domains of the safety climate predicted the nurses' professional behavior. Therefore, it is recommended that hospital administration and nursing leaders improve the safety climate by paying more attention to education and creating friendly working environments that remove nurses' fear of penalties. All these factors can be effective in enhancing the professional behavior of nurses and increase patient safety in health care settings.

Keywords: Nurses, Predictive role, Professional behavior, Safety climate

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Introduction

The quality of care is one of the most important issues in health care systems (1). Patient safety is a core component of the quality of care, which is the main concern of any health care institution (2). About 40% of all health spending is wasted every year due to poor quality of care, leading to extra hospitalization, litigation costs, hospital-acquired infections, disability, reduced productivity, medical costs, *etc.* (3).

Nurses are the main caregivers for patients and they are also responsible for performing many care activities in Health Care Services (4). They play an essential role in patients' care and are the main innovators of safety and quality in the clinical environment (5). Thus, they can play a crucial role in the occurrence of medical errors (4). The results of the systematic review and meta-analysis showed that the overall estimated prevalence of medical errors was 50% (6). A study in Korea represented that nurses reported only 1.11% of their medication errors (7). In Iran, 51% of convicted nurses who have been involved in litigation cases confirm the importance of these errors (2). Many organizational factors have been identified as determinants of safe / unsafe behaviors with safety climate as one of the most prominent factors (8).

Safety climate, which is a subset of the organizational climate in the field of safety, is the attitude of people in care centers regarding safety. There is no unanimous agreement considering the definition of safety climate and it has been construed in different forms in various studies. Generally speaking, safety climate is a measure of values and attitudes toward safety in the organization and demonstrates the level of attention of senior managers to the safety and health of the staff and patients (9,10).

Shahabinejad *et al* reported a safety climate as moderate (10). Akhlaghnejat *et al* also reported a relatively good safety climate (11), while Yarmohammadi *et al* concluded that safety climate is not in a good condition from the perspective of nurses (12). The results of a study by Lee *et al* show that the safety climate of nurses is associated with the intention report medication errors (7). It seems that safety climate has different aspects in different places and under different situations (13). Hence, the study of the development and its consequences is of great

importance.

In addition, the nurses' performance is identified as an important component in providing qualitative medical services (4,5) that can influence the safety climate (12,13). Improving the performance of an organization, in addition to the capability and mental health of the staff, also depends on the professional behavior of the employees. In this line, professional behavior is one of the effective factors in the organizational development (14).

Professional behavior is part of the professionalization of nurses and constitutes one of the basic concepts in the field of nursing. It results from the individual's interaction with the working environment and interpersonal communication skills (13). Professional behavior is a static practice in which the humanity and dignity of all stakeholders are respected (15). Professional behavior in nursing indicates the observance of special behavioral standards that are performed in presenting nursing care to patients to improve the nursing performance (14).

The results of the studies by Dikmen *et al*, Arslan *et al*, and Tanaka *et al* showed that the professional behavior of nurses is at an unfavorable level (16-18). However, there is evidence that suggests the existence of moderate-to-favorable professional behavior among Iranian nurses (5,19,20). Additionally, there are studies that have demonstrated a significant difference between the professional behavior of nursing students and nurses after starting work as professional nurses, where they exhibited appropriate or inappropriate trends in terms of professional behavior (19,21). The question why a nurse's professional behavior may change by altering the education environment to a professional one raises the possibility that the working environment of nurses may be an influential factor in bringing about the changes.

Despite some research conducted regarding the safety climate in Iran and also around the world, very limited studies have addressed the issue regarding the areas of safety climate which influence the professional behavior of nurses. Hence, assessing the safety climate and its relationship with the professional behavior of nurses can be considered as a useful step in managing human resources so as to decrease the occurrence of accidents and damages. Therefore, in light of the importance of professional care and

Table 1. Demographic characteristics of the nurses participating in the study (595 = n)

Variables	Variable classes	Number	Percentage
Gender	Male	114	19.2
	Female	481	80.8
Level of education	Baccalaureate degree	566	95.1
	Master's degree	29	4.9
Marital status	Single	194	32.6
	Married	401	67.4
Employment status	Contractual / official	296	49.7
	Contractual	105	17.6
	Project-based contract	145	24.4
	Other	49	8.2
Shift work	Fixed shift	86	14.5
	Rotational	509	85.5
The current employment	Emergency Room	108	18.2
	Intensive care (ICU, CCU and dialysis) and operating room	264	44.4
	General Wards (Medical and Surgical Wards)	223	37.5

Table 2. Safety climate (and its domains) and professional behavior in 8 public hospitals in Bushehr, Iran

Variables	Domains	Achievable Score Range	Minimum	Maximum	Mean	Standard Deviation
Safety Climate	Cumulative burnout	5-25	5.00	25.00	12.81	4.71
	Training	5-25	5.00	25.00	16.76	4.23
	Communication with the doctor	3-15	3.00	15.00	9.30	2.44
	Communication with the nurse	3-15	3.00	15.00	10.98	2.31
	Supervisors' attitudes	3-15	3.00	15.00	10.20	2.53
	Error and mistake reports	3-15	3.00	15.00	10.77	2.12
	Total score	22-110	22.00	110.00	70.83	12.49
Professional behavior	27-135	48.00	135.00	113.04	15.63	

Table 3. Predictors of professional behavior of the nurses participating in the study

Predictive variables β	Univariate regression		Multivariate regression					
	p value	B	β	t	p-value	95% CI		
Gender (Reference: Male)	-0.055	0.199	-	-	-	-	-	
Bachelor's Degree (Reference: Master's degree)	-0.039	0.342	-	-	-	-	-	
Being married	0.044	0.283	-	-	-	-	-	
Employment Status (Reference: Contractual / official)	Contractual	-0.007	0.878	-	-	-	-	-
	Project-based contract	0.018	0.683	-	-	-	-	-
	Other	-0.025	0.554	-	-	-	-	-
Fixed Shift	0.05	0.222	-	-	-	-	-	
Department of Service (Reference: Emergency ward)	Intensive care and Operating Room	0.009	0.870	-	-	-	-	-
	General Wards	0.092	0.107	-	-	-	-	-
Age	0.023	0.523	-	-	-	-	-	
Work experience in the current wards / month	0.052	0.208	-	-	-	-	-	
Average working hours per month	0.005	0.904	-	-	-	-	-	
The level of interest in the nursing profession	0.203	<0.001	0.979	0.142	3.664	<0.001	0.454-1.504	
Cumulative Burnout	0.074	0.072	-	-	-	-	-	
Training	0.270	<0.001	0.385	0.104	2.224	0.027	0.045-0.726	
Communication with the doctor	0.156	<0.001	-0.196	-0.031	-0.701	0.483	-0.746-0.353	
Communication with the nurse	0.261	<0.001	0.683	0.101	2.211	0.027	0.076-1.289	
Supervisors' attitudes	0.245	<0.001	0.334	0.054	1.140	0.255	-0.242-0.910	
Error and mistake reports	0.370	<0.001	1.404	0.191	4.084	<0.001	0.729-2.079	
R square=.152, Adjusted R square=.144, F for model=17.552, p-value<.001								

since the studies in the field of structural factors which evaluate professional behavior in nursing is limited, the present study attempted to investigate the predictive role of safety climate on professional behavior in nurses working in hospitals affiliated to the medical sciences universities in Bushehr, Iran.

Materials and Methods

The present study adopted a cross-sectional correlation design. Since regression analysis was finally used to analyze the data, the sample size was considered for regression according to the sample size formula, *i.e.*, 10 to 30 variables per predictor variable. Due to having approximately six main independent variables (domain of safety climate) and 10 independent demographic and occupational variables, the sample size was determined by 480 subjects, which were finally 576 cases after taking account of 20% attrition. All nurses had inclusion criteria of about 600 individuals.

Sampling was done using the convenience method and the questionnaires were distributed among all the eligible nurses. Of all the subjects, 595 completed the questionnaire. The target population consisted of all the nurses working in eight hospitals affiliated to Bushehr University of Medical Sciences, namely, Shohadaye Khalije Fars (N=236), Emam Hadi (N=28), Emam Hossein (N=19), (Baqiyatallah Hospital (N=30), Amirmomenin (N=62), Zeynabieh (N=45), Emam Khomeini (N=89), and Gangi (N=86). All the hospitals were general and had similar wards such as the emergency department, ICU, CCU, Operating Room, Medical and Surgical Wards, *etc.*

The criteria for inclusion in the study were: consent for participation in the research, having a bachelor's or master's degree in nursing and at least six months of working experience in their respective wards (22). If a nurse had completed only one of the two questionnaires, they were excluded from the study.

Data collection

The study began after obtaining the Code of Ethics from Bushehr University of Medical Sciences. The researchers made visits to all the wards in three working shifts for 6 months from September 3, 2019 to February 10, 2020. The purpose and method of the study were explained to the nurses. First, they were

asked to complete the consent form. The demographic form and questionnaires including the safety climate questionnaire and the nursing professional behaviors scale were then given to those who wanted to participate in the study. Additionally, they were asked to fill out the forms by themselves.

The safety climate questionnaire has been developed by Salimabadi *et al* (23). The nurses' safety climate questionnaire is a self-administered questionnaire with 22 items divided into six domains of safety climate for nurses, including cumulative burnout (5 questions), training (5 questions), communication with physicians (3 questions), communication with nurses (3 questions), supervisors' attitudes (3 questions), error and mistake reports (3 questions). Each item is answered across a five-point Likert scale (1 for strongly disagree, 2 for disagree, 3 for neither agree nor disagree, 4 for agree, and 5 for strongly agree). Considering that all the questions had positive aspects, a higher score indicated a higher safety climate from the respondent's point of view. In the present study, the internal consistency of the total safety climate questionnaire was verified with a Cronbach's alpha value of 0.88. In the present study, the minimum and maximum Cronbach's alpha values for the different domains were 0.75 to 0.90, respectively.

The Nurses Professional Behavior scale was developed by Heshmati *et al* (19) by modifying the Questionnaire of Professional Behavior of Nursing Students by Goz and Geckil (24). Its reliability was verified with a Cronbach's alpha coefficient of 0.79. This questionnaire consisted of 27 items and the scoring of these items was based on the 5-point Likert scale (1= never, 2= rarely, 3= often, 4= sometimes, and 5= always). Point 1 was given to the "Never" option and 5 was assigned to "Always". The achievable score range is 27 to 135, and a higher score means better professional behavior. In the present study, the internal correlation of the questionnaire was confirmed with a Cronbach's alpha value of 0.92.

To evaluate the satisfaction level with the nursing job, a question was asked in the demographic section of the questionnaire. In order to respond to this question, there was a straight line and the numbers 1 to 10 were marked on it. Number one was the lowest sign and number ten was the highest sign of satisfaction with nursing as a job.

Ethical considerations

After obtaining the required licenses and the Code of Ethics, the inquiry started. Then, after clarifying the goal of study to the nurses, attaining their oral consent, and emphasizing the fact that the data will remain confidential; the nurses were asked to complete the questionnaires. It should be mentioned that there were no fields in the questionnaires asking for any type of identifying personal details. To diminish the possibility of limited access to genuine information given the problems of occupational safety, insufficient trust or busy schedules, the researcher made visits to the wards with prior coordination at less busy times and tried to increase the accuracy of the responses by clearly explaining the research goals.

Data analysis

The data were analyzed using the SPSS V.19 statistical software. First, the distribution of the quantitative data was examined using the Kolmogorov–Smirnov test, and then the tests were done based on the normality of the data. The data analysis was performed using univariate regression and multivariate linear regression at the significance level of 0.05. It is worth noting that the assumptions of linear regression including the normality of residual distribution, residual independence, the absence of outliers influencing the independent or dependent variables, and the absence of multiple alignments were examined.

Results

The average age of the participants was 32.92 ± 7.28 . Also, the average working experience in the respective wards was 55.61 ± 64.90 months and the average working hours per month were reported to be 223.42 ± 45.00 . The average score of satisfaction with the nursing job was 7.51 ± 2.27 . The other demographic attributes of the participants are provided in table 1. The average and standard deviation of the safety climate and its domains, as well as professional behavior are reported in table 2.

Based on the results of the multivariate regression, among different areas of the safety climate, nursing education, communication with other nurses and error reporting had a statistically significant direct relationship with the professional nursing behavior. The highest regression coefficient was associated

with the error reporting domain. Apart from the safety climate, satisfaction with the nursing job was also directly and significantly associated with professional behavior. The other demographic and occupational factors did not have a significant relationship with the professional behavior of the nurses. The results of the univariate and multivariate regression analyses are provided in table 3.

Discussion

The aim of this study was to examine the predictive role of the safety climate on professional behavior among nurses. The findings demonstrated that the professional behavior of the nurses was above the average and the safety climate was at the average level. Of the different domains of the safety climate, nursing education, communication with other nurses and error reporting had a positive and significant direct relationship with professional behavior among the nurses. In addition to the safety climate, satisfaction with the nursing job was also directly associated with professional behavior of the nurses. There were no studies available at the research database on a general overview of the nurses' safety climate with regard to professional behavior. Therefore, the domains of safety climate regarding professional behavior that had a significant relationship in the statistical analyses were compared and examined.

The results showed that the domain of nurse education is a direct predictor of professional behavior. This finding is in line with the results of AbuEla *et al* and Afshar *et al* (25,26). However, they are in contrast with those by Alipour *et al* (27). The results of the study by AbuEla *et al* showed that education can affect and promote professional behavior among nurses (25). The participants in the study conducted by Afshar *et al* described education as an effective factor in fostering professional behavior in nurses (26). However, the study participants in Alipour *et al* explained the effect of crowded hospitals on professional behavior as more important than education (27). It appears that the difference in the study method is the reason for these different findings. However, it is important to note that in addition to education, nurses' working conditions (*e.g.*, the workload of the hospital and its staff, the type of hospital and other related occupational issues)

affect their professional behaviors (17,27), which can serve as a recommended area for future studies.

The current study findings showed that the domain of communication with other nurses is a direct predictor of professional behavior. This finding is consistent with the findings of other similar studies (26,28). Studies indicate that the type of communication between nurses can affect their performance (29,30). Inadequate and insufficient communication between them and nurse managers is one of the important barriers to effective practical and professional behavior of nurses (26,29,30). Mohamed *et al* found that a positive understanding of the climate by nurses makes them more efficient (28). Good communication encourages nurses to voice their opinions, through each other's relationships and to solve problems, which lead to improved professional behavior (26), better performance and greater patient safety. Therefore, nurses should be aware of their behaviors and the effects that their behaviors may have on others in the working environment. This outcome simply highlights the importance of communication in nursing. Educating nursing students and nurses on how to communicate correctly and free of individual judgment can create a safe climate for intra-departmental and inter-departmental cooperation and error reporting that finally leads to the optimal performance of nurses and amelioration of their professional behavior. Of course, educating communication is only one part of the essential education for ameliorating the professional performance of nurses. Training the nurses with appropriate scientific knowledge and skill level can improve the safety of the climate.

Based on the research findings, the domain of error reporting was also shown to be a direct predictor of professional behavior. An integrative literature review by Woo *et al* demonstrated that nurses consider voluntary reporting of errors as part of their professional responsibility (31). Nurses who experienced a high level of safety culture were more likely to report errors (32). Lee *et al* showed in their study that there is a significant positive correlation between perceived safety climate and attitudes toward medication error reporting (33). These findings are consistent with the present study. A safety climate can improve patient safety and error reporting in the

hospital by building trust and improving problem-solving skills. Considering the aspects of professional behavior, an adroit nurse knows his/her role well and not remaining silent in unethical situations is a sign of professional behavior. One of the best and most effective ways to improve professional behavior is by learning from errors. When nurses feel free to report errors without fear of retribution, the problem is rooted out and it provides an opportunity for nurses to have a professional behavior in relation to their practice and try not to repeat the mistakes again in the future.

The present study results also revealed that satisfaction with the nursing job was a predictor of professional behavior. These findings are in line with some of the research that has been conducted in this area (3,34,35). The results of Safavi *et al* demonstrated that satisfied nurses work better, provide high quality services, and behave more professionally. Also, it is noteworthy that job satisfaction can be one of the most important and influential factors in nurses' behavior (36). Hence, managers and nursing officials who take measures to improve job satisfaction provide the basis for improved performance and professional services by nurses. These measures have shown to have a remarkable effect on improving employee performance.

Strengths and limitations of the study

The present study is the first investigation conducted to examine the predicting the role of nurses' climate of safety and their professional behavior in Iran. It could shed light on the predictive dimensions of the nurses' climate of safety and its effect on the professional behavior. However, it has some limitations. This study is cross-sectional and quantitative; therefore, it has the limitations of quantitative studies. In addition, the identified relations should not be interpreted casually. Owing to some concerns on the part of the participants and various security and occupational considerations, there was a possibility of inaccuracy in the statements and information provided by the nurses. Most of the present samples were taken from the three larger hospitals in the province, and the smaller hospitals had fewer inclusion criteria for research, and since most of their staff consisted of temporary or inexperienced nurses, they constituted a smaller share of the sample.

The study was conducted in a research environment with geographical constraints and specific socio-cultural characteristics, thus the generalization of the results of the present study to other communities and cultures should be done with caution.

Conclusion

This study showed that education, positive communication between nurses and error reporting are important domains of a safety climate predicting the nurses' professional behavior. In a safe climate, nurses have more opportunities to learn from each other, more freedom to ask questions and resolve ambiguities. They can report their mistakes without worrying about the judgment of their colleagues. It is recommended that an improved climate of safety for nurses be included in the agenda of managers and planners of nursing.

Lastly, it should be mentioned that the safety climate and professional behavior are not affected by only one variable. Rather, a set of variables and their interactions can affect the professional behavior, as

well as the safety climate. Further studies on the roles of mediating variables can be helpful in obtaining more accurate results.

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Conflict of Interest

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