

# The Predicting Role of the Safety Climate in the Professional Behavior of Nurses: A Cross-Sectional Study

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## Research Article

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# Abstract

**Background:** Safety climate which is a subset of organizational climate in the field of safety mirrors the attitude of people in care centers towards safety. In addition to being in connection with diverse parts of the organization's function, safety climate can also affect the nurse's performance.

**Aim:** The present study aimed at determining the predicting role of the safety climate in the professional behavior of nurses working in hospitals affiliated to Bushehr University of Medical Sciences.

**Methods:** In this cross sectional study, which is of descriptive analytical type, 595 expert nurses currently working with more than 6 months of working experience in the medical wards of hospitals affiliated to Bushehr University of Medical Sciences entered the study. Data was gathered from the viewpoint of the nurse and professional behavior through a demographic information form and two safety climate questionnaires. Then the data were analyzed by V.19 SPSS which is statistical software. The data analysis was conducted using univariate regression and multivariate linear regression at the significance level of 0.05.

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

**Conclusion:** Attempts to create a ward, in which the nurses receive the necessary education in an appropriate time and ameliorate their expertise, as well as a climate in which nurses have such a good relationship with their colleagues that they can easily talk about the possible mistakes and errors, can upgrade nurse's professional behavior.

## Introduction

The function of an organization is outstandingly decided by its processes and the performance of its human resources. Organizations are able to survive by caring about their employees. In today's competitive condition, the importance of human resources in the development of organizations, including health care organizations, is quite evident. Nurses are the largest workforce in healthcare organization around the world [1–3].

Nurses play a fundamental role in providing proper care and promoting patients' health. Nurses are the biggest predictor of patients' satisfaction with the care provided in hospitals [4]. Hence, making a positive working situation or positive organizational climate will progressively expand the satisfaction level, productivity and the nurse's performance. By organizational climate we mean a repetitive pattern of behaviors, outlooks and feeling which specify the life form of that organization [2].

# Background

Safety climate which is a subset of organizational climate in the field of safety, It is the attitude of people in care centers regarding safety. Safety climate doesn't have a sole definition and it is construed in different forms in various studies. Generally speaking, safety climate is a measure of values and attitudes towards safety in the organization and demonstrates the level of attention of senior managers to personnel and patient's safety and health [5, 6].

Based on the theory of reliability, organization with high level reliability are those which operate without any errors, during a long period of time in stressful conditions, where the occurrence of error leads to catastrophic results [7]. Given this theory, leaders prefers safety over other organizational goals and then shapes the employees understanding of safety climate, which in turn results in the involvement of employees in safety behaviors (such as teamwork or speaking up) and can ameliorate safety results and reduce the failures in forefront [7, 8].

The results of the Meta analysis of Christian et al (2009) demonstrated that the safety climate of working environment is an effective factor on employee's performance [9]. Valentin et al (2013) in the study of medical errors and safety climate in some special wards of three European countries figured that a safe climate can diminish the medical errors in these wards significantly [10]. The reports of the study about the safe climate are different. Akhlaghnejat et al (2019) reported a relatively good safety climate [11]. While Yarmohammadi et al (2020) inferred that safety climate is not in a good condition in the viewpoint of nurses [12]. It seems that safety climate is different according to different places and diverse situations. Hence, the study of the development and its consequences is of a great importance.

Safety climate is associated with diverse parts of the organizational performance, including nurses' performance [1, 6]. In the hospital environment, the nurse's performance is scrutinized as a notable component in providing high quality medical services [1]. Improving the performance of an organization, in addition to the capability and mental health of staff, also depends on the professional behavior of employees. Organizational professional behavior is one of the effective factors in organizational development [4].

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

The results of the studies of Yurdanur Dikmen et al (2016), Filiz Hisar et al (2010) and Michiko Tanaka et al (2014) showed that the professional behavior of nurses is on an unfavorable level [16–18]. But evidences demonstrate the moderate to favorable professional behavior of Iranian nurses [4, 15, 19, 20]. However the inquiry of Heshmati Nabavi et al (2014) illustrates that despite the fact that there is an

acceptable level of professional behavior in first year students, but developing these behaviors during the internship as well as after starting work experience as a professional nurse doesn't have a suitable process [21]. The issue of why nurse's professional behavior alters with the alteration of education environment to a professional one evokes the possibility that the working environment of nurses may be effective in bringing about change.

Despite some researches have been conducted about the safety climate in Iran and also around the world, very limited studies have addressed the issue of which of the areas of safety climate most influences 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 accidents and damages. So, given the significance of professional care and due to the limited studies on structural factors affecting professional behavior, the present research aimed at specifying the predicting role of safety climate in the professional behavior of nurses working in selected teaching hospitals in Bushehr province.

## **Methods**

### **Study design**

The present study is a cross-sectional correlation study conducted in 2019. The population of the study incorporates all nurses working in hospitals affiliated to Bushehr University of Medical Sciences (9 hospitals).

### **Study population**

Sampling was done by Convenience method and a questionnaire was given to all eligible nurses. 595 people completed the questionnaire. The criteria for entering the inquiry were: satisfaction with participation in the research, having a bachelor's or master's degree in nursing and at least six months of working experience in the current ward. If a nurse has only completed one of the two questionnaires, he/she would be excluded from the study.

### **Instruments**

Data were gathered through a demographic information form and two safety climate questionnaires from the viewpoint of the nurse and professional behavior. To evaluate the satisfaction level with the nursing job, a question was asked in the demographic information 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 the nursing job.

To appraise the safety climate of nurses, the safety climate questionnaire of Naghavi Konjin et al. (2015) were adopted [22]. This questionnaire consists of 22 questions and its validity has been ensured by the designers. This questionnaire investigated 6 areas of safety climate, i.e. cumulative burnout, nursing education, communication with physicians, communication with nurses, attitude of supervisors, reporting errors and mistakes. The items were scored on the Likert scale and 5 points were attributed to the items

(strongly disagree, disagree, have no opinion, agree and strongly agree). The score 1 is assigned to completely disagree and the score 5 is assigned to completely agree. A higher score means 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 Cronbach's alpha 0.88. In the present study, the minimum and maximum Cronbach's alpha for its different domains was 0.75 to 0.90 respectively.

The Nurses' Professional Behavior Questionnaire was designed by Heshmati et al (2012) [21] through adjusting the Goz and Geckil (2001) Nursing Students' Professional Behavior Questionnaire [23]. Also its reliability was verified by Cronbach's alpha coefficient of 0.76. This questionnaire had 27 items and the scoring to these items was conducted based on the 5 point Likert scale (not at all, sometimes, I have no idea, often and always). The point 1 was given to the "not at all" 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 with Cronbach's alpha was confirmed with 0.92.

### **Data collection**

After obtaining essential licenses and receiving ethic code, the inquiry started. After illustrating the goal of study to the nurses, getting oral consent and emphasizing the fact that the data will remain clandestine; the questionnaires were completed without mentioning the name. In order to diminish the possibility of limited access to genuine information given the problems of occupational safety, insufficient trust or busy nurses, the investigator went to the wards with prior coordination and less busy time and tried to increase accuracy by illustrating and explaining the goals. All methods were carried out in accordance with relevant guidelines and regulations.

### **Data analysis**

The data were analyzed, using V.19 SPSS statistical software. First of all, the distribution of quantitative data was examined by Smirnov Kolmogorov test, and then the tests were done based on the normality or not of the data. Data analysis was performed using univariate regression and multivariate linear regression at the significance level of 0.05. It is noteworthy to say that assumptions of linear regression including the normality of residual distribution, the assumption of residual independence, the absence of outlier influencing on independent or dependent variable and the absence of multiple alignment was scrutinized.

## **Results**

The average age of the participants was  $32/92 \pm 7/28$ . Also, the average working experience in current ward was  $55/61 \pm 64/90$  months and the average working hours per month were reported to be  $223/42 \pm 45/00$ . The average score of satisfaction with the nursing job was  $7/51 \pm 2/27$ . The other demographic attributes of the participants are presented in Table 1. The average and standard deviation of safety climate and its domains as well as professional behavior are reported in Table 2.

Table 1  
Nurses' characteristics

<b>Variable</b>	<b>Variable classes</b>	<b>Number</b>	<b>Percentage</b>
Gender	male	114	19.2
	Female	481	80.8
Educational level	Baccalaureate degree	566	95.1
	Master's degree	29	4.9
Nurses' marital status	Single	194	32.6
	Married	401	67.4
Nurse employment status	Permanent position	296	49.7
	Temporary position	105	17.6
	Types of contracts	145	24.4
	Types of contracts	49	8.2
Shift work	Fixed shift	86	14.5
	in circulation	509	85.5
Place of service	Emergency departments	108	18.2
	Special wards and operating room	264	44.4
	General sections	223	37.5

Table 2  
nurse Climate and its domains and professional behavior

<b>Variable</b>	<b>Area</b>	<b>Achievable score range</b>	<b>minimum</b>	<b>maximum</b>	<b>Mean</b>	<b>Standard deviation</b>
Nurse safety climate	Cumulative burnout	5–25	5.00	25.00	12.81	4.71
	Nursing education	5–25	5.00	25.00	16.76	4.23
	Contact 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
	Supervisor attitude	3–15	3.00	15.00	10.20	2.53
	error report	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

According to the outcomes of multivariate regression, among the different areas of 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 related to professional behavior. Other demographic and occupational factors did not have a significant relationship with the professional behavior of nurses. The results of univariate and multivariate regression are provided in Table 3.

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

Predictive variable		Univariate regression		Multivariate regression				
		$\beta$	P value	B	$\beta$	t	P value	95% CI
Gender (reference: Male)		-0.055	0.199	-	-	-	-	-
Bachelor's Degree (Reference: M.Sc.)		-0.039	0.342	-	-	-	-	-
Being married		0.044	0.283	-	-	-	-	-
Nurse employment status (Reference: official)	Permanent position	-0.007	0.878	-	-	-	-	-
	Temporary position	0.018	0.683	-	-	-	-	-
	Types of contracts	-0.025	0.554	-	-	-	-	-
Fixed work shift		0.05	0.222	-	-	-	-	-
Department of Service (Reference: Emergency ward)	Special wards 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	-	-	-	-	-
Nursing education		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
Supervisor attitude		0.245	< 0.001	0.334	0.054	1.140	0.255	-0.242–0.910

Predictive variable	Univariate regression		Multivariate regression				
	$\beta$	P value	B	$\beta$	t	P value	95% CI
error report	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,

## Discussion

The aim of this study was to determine the predicting role of the safety climate in the professional behavior of nurses working in chosen hospitals affiliated to Bushehr University of Medical Sciences in 2019. The finding demonstrated that the professional behavior of nurses was more than the average and the safety climate was almost average. Among the different areas of safety climate, nursing education, communication with other nurses and error reporting had direct relationship with the nursing professional behavior. Apart from safety climate, satisfaction with the nursing job was also directly associated with professional behavior of nurses.

The results showed that the scope of communication with the nurse is a direct predictor of professional behavior. Evidences also demonstrate that the kind of nurse's relationship with each other can have an effective role on their clinical and professional performance [24, 25]. Moore et al (2013) declare that the relationship of a nurse with the other nurse is a key component in the working environment health. They also said that the positive relationship of nurses was main factor in creating a healthy working climate [26]. When the climate is such a good one that nurses can easily interact with each other and talk about their mistakes and those of other nursing members without judgment, they can act in line with the aims set by their profession and provide services to the patient without worries and intellectual burden caused by the judgment of colleagues. Part of professional behavior which is of a great importance along with providing care to the patient, is paying attention to ethical issues and reporting errors. Nuhi et al. (2014) demonstrated in their study that there is a negative statistical and significant relationship between safety climate and barriers of error reporting [27]. A safe climate for nurses diminished burnout and allows them to have optimal professional performance and do their best to provide high quality care for patients. Abdullah Mohammad et al (2018) revealed that the positive understanding of the climate by nurses makes them more efficient [1]. 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 educating 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; which finally leads to the optimal performance of nurses and the 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 nurses with appropriate scientific knowledge and skill level can improve the safety of the climate.

The results of the present study conveyed the relation between nurse education and as a domain of safety climate and nurses' professional behavior. The outcomes of the Lucy AbuEIEla et al inquiry showed that education and training can play an effective role in the nurses' professional behavior and upgrade that factor [28]. Alipour et al (2019) demonstrated in a qualitative study that barriers to appropriate education prevent professional behavior in nurses. The participants of the Alipour et al.'s investigation mentioned these items as barriers for suitable training: deficiency in educators, inadequate primary education, inconsistent training, and lack of interest for professional education. They also declared that training nurses for being professional doesn't actually work in crowded hospitals [29]. The results of the study of Alipour et al are in line with the present study in terms of effect of nursing education on professional behavior. But regarding the ineffectiveness of education in crowded hospitals, it is not comparable to our inquiry, since the tools that have been used in the present investigation don't pay attention to the effect of education according to the type of hospital. From this issue we can remember that in addition to education, other variables such as the workload of the hospital and its staff, the type of hospital and other occupational issues may also affect the professional behavior of nurses, which are suggested in future studies, because preparation for training is itself a part of your career [18].

Based on the research findings, the field of error reporting was also a direct predictor of professional behavior. This finding was consistent with the study of Mortazavi et al (2013) and Abou Hashish et al (2013) in association with reporting medication errors and Aly et al (2014) in announcing patient safety incidents [30–32]. Also Nuhi et al. realized that there is a negative and significant relationship between safety climate and barriers of error reporting by nurses [27]. Kim et al (2014) announced a significant relation between instances of professional behavior and willingness to report errors. In the aforementioned investigation, the clarity of the role was directly statistically related to the error reporting and defensive silence was inversely related to error reporting [33]. Given the items of professional behavior, an adroit nurse knows his/her role well and not being silent in unethical situations is a sign of professional behavior. Of course you should note that professional behavior may be the cause of a safe climate, rather than the result of a safety climate, including error reporting. It means that a professional nurse with professional behavior can create a safe climate.

The outcomes demonstrated that satisfaction with the nursing job was a predictor of professional behavior. These findings are in line with some of the inquiries that have been conducted in this field [2, 34–36]. The results of Safavi et al.'s study conveyed 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 [2]. Hence, managers and nursing officials ameliorated job satisfaction; provide the basis for improving performance and presenting professional services by nurses, through delivering diverse contexts related to job satisfaction. These measures had a remarkable effect on improving employee performance.

## **Strengths And Limitations Of The Study**

The present study is the first investigation that has been conducted in the field of the predicting the role of nurses' safety climate and their professional behavior in Iran. It could specify the predictive dimensions of the nurse's safety climate on their professional behavior. However, it has some limitations. This study is cross-sectional and quantitative; therefore, it has the limitations of quantitative studies. Besides, determined relations should not be interpreted casually. Given the concerning of the participants, various security and occupational risks, there was a possibility of errors in the statements and information. The inquiry was done in the in a research environment with geographical constraints and specific socio-cultural characteristics, so the generalization of the results of the present study to other communities and cultures should be done with caution.

## **Conclusion**

According to the outcomes of the present study we can infer that taking steps that improve the safety of the nurses must be on the agenda. By doing these measures we not only ameliorate the safety climate of nurses, but we also improve and upgrade their professional behavior. Therefore, the safe climate of the nurse should be scrutinized as one of the strategies that lead to improving services and decreasing medical errors. In addition, both the safety climate and professional behavior are unlikely to be affected by one variable; instead, a set of variables and their interactions can affect professional behavior as well as the safety climate. Further studies in the field of mediator variables can be helpful in obtaining more accurate outcomes.

## **Declarations**

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The present study is extracted from the master's thesis of a nursing student and it has been verified by the ethics committee of Bushehr University of Medical Sciences. The authors express their thanks and gratitude to the Vice Chancellor for Research of Bushehr University of Medical Sciences and also to all the nurses participating in the study.

### **Authors 'contributions**

R.B, Y.S and H.V designed the study, arranged ethics approval, Y.S, H.V, F.H and F.H data collected. R.B analyzed the data. HV and FH drafted the manuscript and R.B prepared tables. All authors read, edited for scientific accuracy, and approved the final manuscript.

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### **Availability of data and materials**

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request

### **Ethics approval and consent to participate**

The study was approved by Research Ethics Committee of Bushehr University of Medical Sciences, Bushehr, Iran. *Informed consent* was obtained from all participants

### **Consent for publication**

Not applicable.

### **Competing interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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