

## Safety Attitude and Its Predictor Individual and Organizational Variables among Nurses: A Cross-Sectional Study

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### ABSTRACT

This study evaluated the safety attitude and determined its predictor individual and organizational variables among nurses. This cross-sectional and descriptive-analytical study was conducted on 295 nurses working in hospitals affiliated to the Babol University of Medical Sciences, northern Iran (at 6 hospitals) from Oct 2016 to May 2017. The required data was collected using two questionnaires of demographic and organizational information and Safety Attitude Questionnaire (SAQ). The data were analyzed using the SPSS Ver. 23 software. A logistic regression model (Backward: LR) was also used to investigate the effect of predictor personal and organizational factors on the studied nurses' attitude of safety. The highest and lowest scores in the dimensions of the SAQ questionnaire were respectively related to the stress recognition dimension ( $73.57 \pm 17.93$ ) and management perception dimension ( $48.79 \pm 16.17$ ). Based on the Pearson correlation, a significant correlation was established between the six dimensions of the questionnaire except for the stress recognition dimension. In addition, the most important individual-organizational factors affecting the attitude of the studied nurses included gender, training, work experience, education, and type of the ward. Since among the individual-organizational variables affecting the attitude of safety, the nurses' training can be acquired, it is recommended to hold regular safety courses along with an assessment after the training to improve the safety attitudes, and consequently, reduce the occupational accidents for nurses.

**KEYWORDS:** *Safety attitude, Individual variables, Organizational variables, Predictor variables, Nurses*

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## INTRODUCTION

Investigating the roots of events reflect a high percentage of accidents occur due to human errors and weaknesses in the management [1]. Hence, controlling these factors to achieve a safe and acceptable environment is not realized simply by benefiting from advanced management systems and technology and preventing the accidents requires the improvement of safe behaviors in employees, their values, beliefs, and views, referred to as the "safety culture" [1].

People's attitudes are predetermined answers obtained from their experiences from similar situations. In other words, attitude can be defined as the tendency to a particular behavior in certain circumstances and tendency to positive (agreeing) or negative (disagreeing) responses to certain individuals, objects, and situations. Thus, the employees' attitude towards different aspects of work, including safety issues, is the product of the experiences of employees inside and outside the work environment [2-3]. Positive attitude to safety issues is seen as one of the important components of a suitable safety culture in the workplace [4].

The attitude of safety addresses the matters of every person's beliefs and his feelings about the safety issues and represents the sense of commitment and responsibility of the individual relation to safety issues. At the same time, it reflects a person's belief in guidelines, policies, rules, procedures and safety procedures [5]. A desirable safety attitude in staff increases the safety level in the work environment, enhances the number of safe behaviors and reduces occupational accidents and near-misses [6].

An attitude of safety in each person indicates his previous readiness to provide a positive or negative reaction in response to the surrounding events, and at the same time, a combination of safe thinking and its tailored functioning [7-8].

Hospitals are considered as inherently risk-generating organizations for their patients and personnel, especially the nurses. Hence, safety behaviors in hospitals are very important in relation to the occurrence of occupational accidents. Medical errors and potential unsafe acts are as the most important challenges in nursing profession [9]. On the other hand, improving the patients' safety requires the nurses' organizational commitment to awareness for understanding possible errors and diagnosis, analysis and correction of mistakes at a time they may occur. Therefore, nurses' attitudes toward safety issue and its implementation play a crucial role in patients' safety and nurses' protection [10-11].

In the medical care centers, the activities of the nursing forces appear to be more crucial due

to the provision of health care measures and extensive communication than other groups. Those active in this profession are subject to a wide range of hazards, which can have adverse impacts on their physical and mental health as well as their occupational activities. They subsequently can, directly and indirectly, affect the quality of their service delivery. In other words, unsafe working conditions of nurses can have a negative effect on the safe/desirable treatment of patients. In fact, the safety attitude and perception of personnel have a direct impact on the work process and, consequently, the patient safety [12-13].

Workplace safety culture (including nurses' workplace) can be evaluated in a variety of techniques. One of the most commonly used methods is to use the Safety Attitude Questionnaire (SAQ), which this method while low cost and having practical and comprehensive results examines the viewpoint of personnel on the safety issue [14-15]. Based on the study on Lebanese nurses, the beneficial results extracted from the SAQ questionnaire provide useful information for improving the patients' safety status, reducing accidents and forming more an integrated safety culture to the policymakers. Moreover, people with positive attitudes had a better collaboration with other colleagues and patients than those with negative attitudes, which represents the extent of the impact of the safety attitude on other issues [16].

Since the attitude of a person forms the basis of his behavior, and, on the other hand, unsafe actions are known to be caused by factors such as negative and weak attitudes in the individual, measuring people's attitude of safety can predict their safe or unsafe behaviors in the future. Moreover, through the use of appropriate controlling methods, the incidence of occupational accidents can be reduced and the safety of the work environment may be increased [17].

Through the assessment and evaluation of employees' safety attitudes and implementation of formulated safety training, we can take effective steps to reduce the incidents, unsafe actions, reduce human errors and increase the costs effectiveness. Considering the importance of the issue of measuring the culture and attitude of safety, its significance as one of the main strategies of the patients' safety, and the challenges of implementing a system of clinical governance and conducting scholarly and structured studies concerning the safety attitude, this study evaluated the safety attitude and determined its predictor individual and organizational variables among nurses.

## MATERIALS AND METHODS

**Study design:** This cross-sectional and descriptive-analytical study was conducted from Oct 2016 to May 2017. The statistical population included all nurses (n = 1278) working in hospitals affiliated to the Babol University of Medical Sciences, northern Iran (in 6 hospitals) during this period. The sample size was estimated based on the Cochran formula and considering the positive attitude ratio of 0.5 among nurses, the first type error level of 5% and the confidence interval of 95% among the 295 subjects. This sample size was calculated based on the ratio of nurses in each hospital and the inclusion and exclusion criteria by a randomized quota method and using random numbers table, and finally enrolled in the study. The criteria for nurses entering the study included having a bachelor's degree in nursing, full-time work, lack of a second job, lack of mental and physical disorders according to their statements, and having at least one year of experience in the current wards. In addition, the exclusion criteria involved refusal to continue cooperation and incomplete completion of questionnaires by the subjects.

**Data collection tool:** Data collection was done using the following two questionnaires:

Demographic and organizational information: To collect this category of information, a simple data collection form, including age, gender, work shift status, marital status, department or workplace, employment status, work experience, education level, and job position was used [18].

SAQ: This questionnaire was designed [14] and so far, it has been frequently used to evaluate the hospital staff opinions around the world [16, 19-20]. The mentioned questionnaire has 30 questions. The questionnaire measures six dimensions, including:

The teamwork atmosphere, which deals with the interaction and communications of personnel, and represents the degree of trust, respect and mutual cooperation of individuals with each other (Questions 1-6). The safety climate, which indicates the understanding and perception of employees of the confounding factors of safety in the workplace and responsiveness and response of employees and management to the workplace risks (Questions 7-13). Job Satisfaction, which involves the understanding of the value of work and emotional issues and feelings related to the job and their effects on the employees' attitudes (Questions 14-18). Recognition of stress, which addresses the employees' awareness of workplace stresses and their perspectives about the potential impact of these factors on disrupting their performance (Questions 19-22). Management

perception (attitude towards hospital management and ward support for the patient safety), which reflects the staff's perception of management support in providing sufficient resources to create safe conditions (Questions 23-26). Working conditions, which focus on employees' views on receiving training, necessary supports on accountability and doing the work tasks (Questions 27-30).

Meanwhile, questions 4 and 13 have inverse semantic load. The five-point Likert scale was used in this questionnaire to obtain the respondents' opinions (Totally Disagree=1, Disagree=2, Indifference= 3, Agree= 4, Totally Agree= 5). Moreover, the reverse scoring was used for negative questions; thus, the scoring was done as follows: Totally Agree=1, Agree=2, Indifference= 3, Disagree= 4, and Totally Disagree= 5. Then, the results of the Likert scale were converted to continuous quantitative quantities for each question. Hence, in case of positive questions, the scores (Likert Scale) were converted as follows: Score 1:0; Score 2: 25; Score 3: 50; Score 4: 75, and Score 5: 100. The procedure was reversed for negative questions; thus, score 1 was considered equal to 100 and 5 was considered finally as zero. The subjects' scores were then ranked from 0 to 100. In addition, the attitude score of more than 75 was considered as a positive attitude [21]. The validity and reliability of this questionnaire in Persian language have been approved in various studies [18].

**Ethical considerations:** After obtaining a permit from the university (code of ethics: MUBABOL, HRI, REC 1395.26) and delivering it to hospitals of Babol City, the researchers visited the hospitals throughout the week (Saturdays to Thursdays) in two morning and afternoon shifts to reach all nurses. Following the explaining the goals of the study individually and obtaining written consent from them, they were provided the questionnaires. Spending about an hour, the questionnaires were completed by the nurses. Eventually, the questionnaires were collected by the researcher. The information about the names and characteristics of individuals were kept confidential by the researchers.

**Statistical analysis:** The descriptive indices reported in this study were the mean and standard deviation. Moreover, the logistic regression model (Backward: LR) was used to evaluate the predictive effect of individual and organizational factors on safety attitude of nurses. The significance level of  $P < 0.05$  was considered in the statistical tests.

## RESULTS

More than two-thirds of nurses were

female and 51.8% of them were in the age group of 30-39 year. Nearly, half of the studied nurses were working in the general wards of the hospitals, and 65.3% had a work experience of less than 10 yr. Most nurses (80.7%) were in the rotating working system, only 6.9% had postgraduate degrees (Table 1). The highest and lowest scores on the dimensions of the SAQ were respectively related to stress recognition ( $73.57 \pm 17.93$ ) and management perception ( $48.79 \pm 16.17$ ). Moreover, based on the Pearson correlation, a meaningful correlation was

established between the six dimensions of the questionnaire except for the stress recognition dimension. Internal consistency assessment of six dimensions and 30 questions of the SAQ, used in this study, ranged from 0.66 to 0.82. In the meantime, the safety atmosphere and stress recognition obtained the highest and lowest Cronbach alpha values (Table 2).

**Table 1.** Individual and Organizational Characteristics of the participating (n=295)

Variables	Category	Total
Gender	Female	225 (76.2)
	Male	70 (23.8)
Age (yr)	20-29	71 (24.1)
	30-39	153 (51.8)
	$\geq 40$	71 (24.1)
Marital status	Married	241 (81.7)
	single	54 (18.3)
Ward	General ward	137 (46.6)
	Emergency Ward	51 (17.3)
	Operating room and surgery ward	53 (17.8)
	Critical care unit	54 (18.3)
Employment Status	Permanent	115 (39.1)
	Contract	180 (60.9)
Clinical experience (year)	$10 \geq$	193 (65.3)
	11-20	75 (25.3)
	$> 20$	28 (9.4)
Shift Work	Fixed duty	57 (19.3)
	Rotating shift	295 (80.7)
Educational Level	BSN*	275 (93.1)
	MSN/PhD**	20 (6.9)
History of patient safety training	Yes	199 (67.3)
	No	96 (32.7)

\* Bachelor of Science in Nursing

\*\* Master of Science in Nursing/ Doctor of Philosophy in Nursing

**Table 2.** Internal consistency and Mean and standard deviation of SAQ items belong to nurses

Items	Teamwork Climate	Job satisfaction	Perception of management	Safety climate	Working conditions	Stress recognition	M (SD)	$\alpha$
Teamwork Climate	1						67.99(11.35)	0.77
Job satisfaction	0.512**	1					63.51(12.78)	0.79
Perception of management	0.202**	0.281**	1				69.06(15.25)	0.69
Safety climate	0.673**	0.598**	0.260**	1			74.57(14.93)	0.82
Working conditions	0.449**	0.465**	0.416**	0.508**	1		51.79(13.17)	0.74
Stress recognition	0.000	0.057	0.054	0.000	0.096	1	60.24(14.81)	0.66

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

According to the regression model, the most important individual-organizational factors affecting the attitude of safety of studied nurses

included gender, training, work experience, education levels and ward type (Table 3).

**Table 3.** Logistic regression models predicting factors related to safety attitude among nurses in Babol -2017

Variables		Negative Attitude n (%)	Positive Attitude n (%)	OR	95%CI	P-value
<b>Gender</b>	<b>Female</b>	130 (44.1)	95 (32.2)	--	--	0.024
	<b>Male</b>	53 (17.8)	17 (5.9)	0.409	0.188-0.890	
<b>History of patient safety training</b>	<b>Yes</b>	112 (38.1)	86(29.2)	--	--	0.043
	<b>No</b>	70 (23.8)	26 (8.9)	0.495	0.250-0.979	
<b>Clinical experience</b>	<b>10 ≤</b>	132 (44.6)	61 (20.8)	--	--	--
	<b>11-20</b>	44 (14.9)	31 (10.4)	1.647	0.811-3.345	0.021
	<b>&gt; 20</b>	20 (6.9)	7(2.5)	4.569	1.460-14.605	0.009
<b>Educational Level</b>	<b>BSN</b>	178 (60.4)	96 (32.7)	--	--	0.010
	<b>MSN/PhD</b>	4 (1.5)	16 (5.4)	3.306	1.541-18.812	
<b>Ward</b>	<b>General ward</b>	69 (23.3)	69 (23.3)	--	--	--
	<b>Emergency Ward</b>	4 (1.5)	47(15.8)	2.694	1.09-6.656	0.032
	<b>Operating room</b>	29 (9.9)	23(7.9)	0.252	0.053-1.209	0.085
	<b>Critical care unit</b>	16 (5.4)	13 (12.9)	2.015	0.691-5.87	0.085

The highest score on the dimensions of the SAQ questionnaire was related to the dimension of stress recognition. In 18 South Korean hospitals, the stress recognition dimension was obtained the highest score, which confirms the present results [22]. Moreover, in the present study, the lowest score among the examined dimensions was related to management perception. In a study on 244 nurses from city of Kerman, the lowest score among the SAQ dimensions was related to management perception, which is consistent with the present study [18].

The results of evaluating the relationship between the six dimensions indicated a significant non-correlation between the dimension of stress recognition and other aspects of the questionnaire, while there was a significant correlation between the other dimensions (5 other dimensions). These results are in line with the results of numerous studies carried out on the validity and reliability of the SAQ questionnaire [14, 19, 23]. The stress recognition dimension cannot reflect the safety attitude of individuals like the other dimensions [18]. The relationship between stress recognition and other aspects of the SAQ questionnaire was investigated, this dimension of the questionnaire was incompatible with the other dimensions and cannot determine the safety perception; thus, the suggested to remove this dimension of the questionnaire [23].

**Relationship between gender and safety attitude:** In the present study, a significant relationship was found between the safety attitude of nurses and gender. Thus, the male nurses' odds ratio was 40.9% lower than the female nurses in the positive attitude toward safety ( $P=0.024$ ). In western Lithuania, a significant relationship 756 nurses in three different hospitals was reported by gender and safety attitude. In this study, the positive attitude of female nurses was reported more than the male nurses [24]. Moreover, in a study in the US on 187 nurses working in the operating room, the results meaningfully suggested a higher positive safety attitude in women than the men [25]. The results of this study are consistent with the results of the mentioned studies. However, in the Netherlands, no significant relationship was between gender and safety attitude of nurses [20]. In Tehran hospitals, the attitude score of men was significantly higher than women [26]. One of the reasons for such a difference in outcome can

be attributed to the contribution of male and female nurses. In this study, 23.8% of nurses were male. However, women are generally more sensitive to keeping with the safety, quality of care of the patient as well as the use of safety principles than the men [27].

**The relationship between training of patient and personnel safety courses with safety attitude:** Acquiring training by nurses in this study was considered as a predictive factor in the attitude of safety of nurses so that nurses not passed personnel and patient safety courses had a 49.4% lower chance of achieving positive safety attitudes in comparison with the trained nurses. In the western part of Lithuania, nurses not passed the patient safety training had more negative safety attitude, which covers the present study results [24]. Therefore, doing measures such as training need assessment and using it to hold personnel and patient safety courses and workshops according to new scientific and research findings is very useful and effective in increasing the nurses' safety attitude as well as in enhancing the satisfaction and improving the quality of patient care and preventing the occurrence of incidents in this profession group [24, 26, 28].

**The relationship between work experience and safety attitude:** A significant relationship was found between work experience and the employees' perception of the patient's attitude of safety. Thus, the safety attitude of nurses with work experience between 10 and 20 yr and nurses with a history of over 20 yr were respectively estimated 1.64 and 4.56 times more than the less experienced nurses (less than 10 yr). Other several studies in nurses also confirm the issue, which mainly relates to gaining more work experience and the formation of a positive safety culture and attitude during the years of working [29-30]. Increasing work experience, people will gain more experiences in relation to the patient safety and observe the safety issues of the patient more carefully.

**The relationship between education and safety attitude:** In this study, a significant relationship was found between education and safety attitude. The chance for nurses with education levels higher than a bachelor's degree in gaining safety attitude was 30.3 times higher than that of nurses with a bachelor's degree. In Kerman,

Iran, no significant relationship was reported between nurses' education level and safety attitude, which is inconsistent with the results of the present study [18]. But the results of this study are in line with the results of another. Higher level of education was reported as an effective factor in increasing the nurses' attitude of safety [26, 31]. The reason for this significance can be due to the effect of gaining more knowledge on the increase in education. In fact, the higher the level of education, the greater will be the nurses' knowledge of patient safety and more positive attitude toward the patient safety; consequently, doing the unsafe actions will reduce. People with higher education would acquire more knowledge about safety issues and understand the patient's safety training more effectively. They also understand and implement the patient safety guidelines in hospitals in a better way [31].

**The relationship between ward and safety attitude:** According to the results of the regression model, there was a significant relationship between the attitude of safety and the hospital wards. Thus, the chance of a positive safety attitude was reported in nurses in the emergency department 2.6 times higher than nurses in general wards of the hospital. In Egypt, no significant difference was reported between the general score of nurses' safety attitude and all types of hospital units [32], which contrasts with the results of the present study. However, surveying the educational records of the emergency department personnel and implementing further training programs along with the special requirements of this section can be a reason for a relationship in this study.

**Limitations:** One limitation of this study was the use of a self-reporting questionnaire to collect data since the psycho-emotional conditions of individuals when completing the questionnaire are one of the determining conditions on how to answer the questions of this category of questionnaires. Moreover, the variables examined in this study were designed based on the researchers' assessments, while there are other various variables such as psychosocial variables affecting the nurses' safety attitudes, used in future studies.

## CONCLUSION

Among the surveyed individual and organizational variables, there was a significant relationship between gender, work experience, education level, ward type and safety training courses with the safety attitudes of studied nurses. Since the nurses' training can be acquired, it is suggested to hold regular periodic safety courses with evaluation after training to improve the safety attitude, and thus, reduce the occupational accidents in nurses.

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