

Critical care nurse's views about safety climate

Shahrbanoo Akhlaghnejat¹, Ezzat Paryad², Ehsan Kazemnezhad Leyli³, Fateme Jafaraghaee^{4*}

¹ MSN, student, School of Nursing and midwifery, Guilan University of Medical Sciences, Rasht, Iran. ² GI Cancer Screening and Prevention Research Center (GCSPRC), Department of Nursing (Medical-surgical), Instructor, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran. ³ Guilan Road Trauma Research Center, Department of Biostatistics Poursina Hospital, School of medicine, Guilan University of Medical Sciences, Rasht, Iran. ⁴ School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.

Correspondence: Fateme Jafaraghaee, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran, Email: fja_a80@yahoo.com.

ABSTRACT

Background: Healthcare organizations have started to consider safety climate as a vital issue in the success of the organization. **Objectives:** this study aimed to examine the safety climate from nurse's views in Critical Care Units. **Methods:** This cross-sectional study was performed among 203 nurses in critical care units of educational hospitals in 2017. The data were collected through Nurses Safety Climate Scale. The data on six safety dimensions were measured. Positive and negative questions separately using a 5-point Likert scale, the mean value was calculated and presented in the result section in 1 to 10 interval. Descriptive statistics, Friedman, ManVitni, Cross-Call Valis tests, and Logistic regression analysis were used to analyze the data. Data were processed using SPSS software. **Results:** Total mean of safety climate as perceived by Intensive Care Units nurses was 6.73 ± 0.94 . The analysis showed that the highest mean of safety climate items was related to "accessibility to personal protective equipment" ($X = 7.58$; $SD = 1.22$) and lowest mean of safety climate items was related to "compliance with safety rules" ($X = 5.826$; $SD = 1.40$). the regression results showed that safety climate was influenced by Sex ($\beta = 1.49$), Absence of doctor in the department ($\beta = 0.794$) and Work experience ($\beta = -.083$). **Conclusion:** According to the results, it can be noted that the level of safety climate in the hospital was fairly good from the nurses' viewpoint, there were indications that improvements in organizational management are needed. Furthermore, managers must pay much attention to dimension of "Compliance with safety rules", because this dimension had lowest Mean among dimensions of safety climate.

Keywords: Safety, Nurses, critical care units.

Introduction

Major challenges face today's health care system is maintaining safety in health centers [1]. There is evidence that safety climate has an impact on individual safety behavior and is an important factor in improving patient safety [2]. Safety climate is defined as efforts to minimize risk of harm to patients and providers through both system effectiveness and individual performance [2]. The concept of the safety climate has been made from a variety of dimensions, which has been reported to varying degrees in studies. in a study, Seven dimensions were extracted by factor analysis are: "opportunities for nursing education", "reporting", "fatigue reduction", "superiors' attitudes", "nursing

conditions", "communications with physicians", and "relationships among nurses" [3]. In other study in Iran 6 factors were identified: employees' involvement in safety and management support, compliance with safety rules, safety training and accessibility to personal protective equipment, Compliance with safety rules, safety communication and job pressure, and individual risk perception [4].

In the critical care units, aggressive diagnostic and therapeutic procedures are used for critically ill patients. In normal conditions that patients who are not experiencing complications during hospitalization, mortality rate is more than 25%, while it reaches more than 40% in case of complications, Therefore, patient safety and risk management is very important in the critical care units [5]. Several studies have reported safety climate scores varying across different clinical specialties with some reporting less safe climates in operating theatres, critical care and emergency departments compared with surgical and medical inpatient areas [6-8], while another study reported a safer climate in critical care units [9].

Healthcare organizations have started to consider safety climate as a vital issue in the success of the organization, and there is a major interest in measuring the attitude and perception of

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healthcare providers toward safety climate [2]. As a subset of healthcare practitioners, nurses make an important contribution to patient safety care. Therefore, it is important to understand how nurses perceive safety climate as this may have a direct impact on patient safety [10]. This study was conducted to assess the safety climate from nurses views in critical Care Units.

Materials and Methods

This Cross sectional study performed among nurses in critical care units of educational hospitals of Rasht in north of Iran 2017. The study protocol was approved by the ethical and scientific review committee of Guilan university of medical sciences with the registration code number ofxxxx. The population of this study was all nurses employed in critical care unit affiliated with Guilan University of Medical Sciences in Rasht. In total, 203 questionnaires were distributed in critical care nurses and 184 were returned. Nursing staff e study were those who communicate directly with patients and were not supervisors. After obtaining informed consent and the conditions for entering the study, all questionnaires were completed by interviewers visiting. Data collection tool was two demographic and patient safety climate questionnaire that developed and tested for validity and reliability by Konjin et al [5]. The questionnaire included demographic variables such as age, gender, marital status, education level, work experience,... The study instrument used was Safety Attitudes Questionnaire (SAQ). The questionnaire consisted of 40 questions, this questionnaire contain the safety climate in six dimensions, including employees' involvement in safety and management support, compliance with safety rules, safety training and accessibility to personal protective equipment, Compliance with safety rules, safety communication and job pressure, and individual risk perception. All responses were measured using a five-point Likert scale (1 = Disagree Strongly, 2 = Disagree Slightly, 3 = Neutral, 4 = Agree Slightly, 5 = Agree Strongly). The survey was distributed to the nurses and each questionnaire was accompanied by a covering letter explaining the purpose of the survey. The letter stressed that the results of the survey would be anonymous and would be used for research purposes only. A verbal consent was obtained from all nurses. The nurses completed the surveys while they were in their work settings. Descriptive statistics was done and data presented as counts and percentages, or mean (standard deviation). Friedman, ManVitni, Cross-Call Valis tests, and Logistic regression analysis were used to assess the association between safety climate and demographic variables

Results

The mean age of participants in this study was 34.23 ± 7.01 years. 11 (6.0%) of participants were male and 173 were female

(94.0%). The work experience average of participant was 10.56 (6.29) years. Other characteristic is shown in Table 1.

Table 1. Demographic variable of participant (n = 184)

Variable	Frequency	Percent	
Marital status	Single	55	29.9%
	Married	129	70.1%
Education	bachelor	167	90.8%
	MSC	17	9.2%
Specific education in Evidence based care	No	62	33.7%
	Yes	122	66.3%
presence of doctor in the department	No	147	79.9%
	Yes	37	20.1%
Work shifts	Fixed	25	13.6%
	Rotating	159	86.4%

Descriptive statistics showed that the total mean of safety climate as perceived by Intensive Care Units nurses was $6.73 \pm .94$. The analysis showed that the highest mean of safety climate items was related to "accessibility to personal protective equipment" (7.58 ± 1.22); In addition, the analysis showed that the lowest mean of safety climate items was related to "compliance with safety rules" (5.826 ± 1.40). (Table 2). Friedman Test revealed a significant difference between dimensions of safety climate ($p = 0.001$, Table 2).

Table 2. The six dimensions of safety climate

dimensions of patient safety climate	Mean	SD	Median	Minimum	Maximum	p-value
employees' involvement in safety and management support	6.564	1.32	6.63	2.13	10.00	0.001
accessibility to personal protective equipment	7.581	1.22	7.78	3.11	10.00	
safety training	6.943	1.47	7.50	2.00	10.00	
compliance with safety rules	5.826	1.40	6.00	2.00	10.00	
safety communication and job pressure	6.235	1.29	6.00	3.00	10.00	
individual risk perception	7.132	1.44	7.00	3.00	10.00	
Total score	6.73	.94	6.78	3.95	9.70	

The association of demographic characteristics with the six dimensions of safety culture is illustrated in Table 3. ManVitni test revealed a significant difference in safety climate mean score between females $6.70 \pm .95$ and males $7.23 \pm .64$. Males had a significantly higher safety climate mean score compared with female participants for accessibility to personal protective equipment and risk perception ($p = 0.07$). Cross-Call Valis test reveal a significant difference in total safety climate score and Age group ($p=0.028$), Education ($p=0.004$), Work experience in ICU ($p=0.004$), Work shifts (0.029). In this study was not found a significant difference between hospitals in the average score safety climate dimensions ($p>0.05$).

Table 3. Association of mean scores each safety climate dimension according to demographic characteristics

Demographics Variable	Safety Climate		employees' involvement in safety and management support)	accessibility to personal protective equipment	safety training	compliance with safety rules	safety communication and job pressure	individual risk perception	Total score
		Mean(SD)							
Sex	Female	Mean(SD)	6.53(1.33)	7.53(1.23)	6.89(1.48)	5.80(1.40)	6.26(1.28)	7.06(1.39)	6.70(.95)
	Male	Mean(SD)	7.05(1.03)	8.40(.67)	7.73(.93)	6.15(1.39)	5.73(1.27)	8.09(1.92)	7.23(.64)
		P	0.213	0.007	0.062	0.294	0.176	0.045	0.072
Age group	<30 years	Mean(SD)	6.55(1.30)	7.31(1.53)	6.72(1.61)	5.95(1.47)	6.29(1.22)	7.05(1.66)	6.66(.96)
	31-40 years	Mean(SD)	6.45(1.31)	7.61(1.05)	6.94(1.45)	5.63(1.30)	6.10(1.34)	7.05(1.34)	6.65(.90)
	≥40 years	Mean(SD)	7.02(1.34)	8.08(.84)	7.46(1.07)	6.23(1.52)	6.58(1.17)	7.58(1.24)	7.19(.99)
		P	0.089	0.038	0.121	0.143	0.266	0.206	0.028
Social status	Single	Mean(SD)	6.37(1.51)	7.37(1.51)	6.73(1.79)	6.04(1.58)	6.52(1.25)	6.95(1.42)	6.63(1.09)
	Married	Mean(SD)	6.65(1.23)	7.67(1.07)	7.03(1.30)	5.72(1.31)	6.10(1.28)	7.20(1.44)	6.77(.88)
		P	0.356	0.383	0.642	0.322	0.037	0.214	0.505
Education	bachelor	Mean(SD)	6.64(1.29)	7.66(1.15)	7.02(1.42)	5.80(1.41)	6.28(1.30)	7.15(1.39)	6.79(.93)
	MSC	Mean(SD)	5.80(1.38)	6.75(1.58)	6.21(1.74)	5.98(1.37)	5.65(1.03)	6.88(1.90)	6.11(.88)
		P	0.005	0.022	0.008	0.056	0.042	0.496	0.004
Work experience in ICU	<30 years	Mean(SD)	6.45(1.37)	7.40(1.43)	6.74(1.67)	6.08(1.43)	6.21(1.30)	7.27(1.52)	6.66(1.00)
	5-9 years	Mean(SD)	6.32(1.29)	7.14(1.22)	6.31(1.55)	5.72(1.42)	6.19(1.32)	6.70(1.64)	6.43(.89)
	10-14 years	Mean(SD)	6.44(1.34)	7.58(1.11)	6.96(1.30)	5.59(1.37)	6.09(1.25)	7.25(1.44)	6.65(.93)
	≥15 years	Mean(SD)	7.16(1.08)	8.17(.88)	7.69(1.11)	5.97(1.37)	6.56(1.31)	6.97(1.07)	7.22(.76)
		P	0.006	0.001	0.001	0.239	0.339	0.417	0.004
Work shifts	Fixed	Mean(SD)	7.04(1.20)	7.96(.82)	7.50(.83)	5.94(1.63)	6.60(1.20)	7.12(1.39)	7.11(.85)
	Rotating	Mean(SD)	6.49(1.32)	7.52(1.26)	6.86(1.53)	5.80(1.36)	6.17(1.29)	7.13(1.45)	6.67(.95)
		P	0.045	0.112	0.07	0.887	0.196	0.973	0.029

Table 4: Regression coefficients in predictive variables of nurses' views about safety climate

variables	(B)	S.E.	sig	Exp (B)	95% C.I.for EXP(B)
Educational level	1.176	0.586	0.046	3.212	1.019- 10.124
Absence of doctors	0.794	0.399	0.046	2.213	1.013-4.834
Work experience	-0.083	0.043	0.057	0.921	0.845-1.002
Work experience in critical units	0.158	0.053	0.003	1.171	1.056-1.299

Logistic regression (table 3) revealed educational level ($P=0.046$), Absence of doctor in the department ($P=0.046$), Work experience ($P=0.05$) and Work experience in ICU ($p=0.003$) be significant predictors of safety climate. the regression results showed that safety climate was influenced by educational level ($\beta =1.176$) Absence of doctor in the department ($\beta =0.794$), Work experience ($\beta =-.083$) and Work experience in ICU ($\beta =.158$)

Discussion:

In the current study we assessed the safety climate among nurses in Intensive Care Units. According to the findings of the present study, from the Range of 1 to 10, the total safety climate scores was 6.73, So mean of safety climate as perceived by Intensive Care Units nurses was fairly good. scores on the six dimensions of safety climate from high to low in participants were related to: accessibility to personal protective equipment, individual risk perception, safety training, employees' involvement in safety and management support, safety communication and job pressure, and Compliance with safety rules.

Overall in some studies in intensive care unit (ICU) teamwork climate, job satisfaction, and stress recognition were the 3 most highly rated subscale [11, 12]. And in our study and most of studies, have shown low perception of management [11-14]. Hospital management should utilize the high job satisfaction of nurses to increase their perception of management.

Results showed a significant difference between dimensions of safety climate, According to positive significant relationship between safety climate factors, Corrective actions in each field can Influence safety climate effectively.

Our results reveal a significant difference in total safety climate score and Age group, Education, Work experience in ICU, Work shifts. In some study showed no significant difference in the level of education and safety climate dimension [15-17]. AbuAlRub 's study showed that nurses who had 10 years and more of experience reported higher perception of safety climate (Mean = 3.10) than nurses who had 1–2 years of experience (Mean = 3.02) [2]. But, Heidari, Sarsangi, Shirali, Monazzam and Olsson's studies showed no significant difference in age and Work experience and safety climate dimension [12, 14, 18-20].

In Olsson's study in a comparison between the three work shifts and the rating of the total SAQ ,and six SAQ dimensions, it was seen that the night shift nurses rated the total SAQ score significantly lower ($p = 0.002$; $n = 500$) with a 0.3 mean true score compared to nurses on the day shift or combined shift. No significant differences were observed between the day and the combined shift ($p > 0.50$) [14].

Significant differences between men and women were not found in safety training, employees' involvement in safety and management support, safety communication and job pressure, and Compliance with safety rules. Some studies showed that the mean difference score of patient safety climate in all dimensions between men and women was not significant [2, 15, 20, 21]. A significant difference was not found in mean score of safety climate dimensions and social status, except in safety communication. In mosavi studys significant difference was not found in mean score of safety climate dimensions and social status, except in supervisors Attitude and reporting [16].

In this study was not found a significant difference between hospitals in the average score safety climate dimensions. In Mousavi's study, a significant difference between three hospitals in the average score patient safety climate dimensions was observed except in nursing conditions [16]. In beedgoli's study was not significant difference between four hospitals in score safety climate dimensions [22].

Logistic regression revealed educational level, Absence of doctor in the department, Work experience and Work experience in ICU be significant predictors of safety climate, some studies on safety climate from nurse views, there was significant difference between Sex, Absence of doctor in the department, Work experience and score safety climate dimensions [2, 14, 23, 24].

Conclusion

According to the results, it can be noted that the level of safety climate in the hospital was fairly good from the nurses' viewpoint, there were indications that improvements in organizational management are needed. Furthermore, managers must pay much attention to dimension of "Compliance with safety rules", because this dimension had lowest Mean among dimensions of safety climate. This study revealed that "Sex", "Absence of doctor in the department", and "Work experience" are the 3 most important demographic variables influencing the safety climate.

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