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Safety climate and related factors in rehabilitation nurses of hospitals in Iran

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Abstract.
BACKGROUND: Safety climate is a common insight of staff that indicates individuals' attitudes toward safety and priority of safety at work.
OBJECTIVE: Nursing is a risky job where paying attention to safety is crucial. The assessment of the safety climate is one of the methods to measure the safety conditions in this occupation. The aim of this study was to assess the safety climate of rehabilitation nurses working in hospitals in Tehran.
METHODS: This is a cross-sectional study which was carried out on 140 rehabilitation nurses selected from all hospitals and clinics in Tehran in 2019. To collect the required data, a two-section questionnaire was used. The first section was related to demographic factors and the second part (22 statements) was to measure the safety climate using nurses' safety climate assessment questionnaire. The collected data were analyzed by SPSS V16 using independent *t*-test, ANOVA, Kruskal-Wallis and Mann-Whitney U test at the 5% level.
RESULT: Findings showed that the total mean of safety climate was 3.06 ± 0.56. According to the results, a significant difference was found between the positive and negative satisfaction of nurses with safety climates (P-value = 0.03), communication with nurses (P-value = 0.01) and supervisors' attitude (P-value = 0.02). Furthermore, a significant difference in safety climate between the individual with the second job and the individual without second could be observed (P-value = 0.01).
CONCLUSION: The results indicated that the safety climate was not at an acceptable level. Thus, it is essential to introduce safety training courses (e.g. safety, work-rest balance, and so on) and to improve the safety performance at work.

Keywords: Safety attitude, hospital safety, patient safety, job satisfaction

1. Introduction

The role of nurses has diverted and developed in the past decades and can be divided in different categories. Considering the expansion of the centers

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for rehabilitation such as physical-motor and mental, there is a need for nurses who can apply professional knowledge and skills in the field of rehabilitation to provide professional care for such patients to achieve prosperity, treatment, and promotion of health [1]. The wide variety of disabilities leads to more complexity of this area of care compared to many others. Providing the services for patients of all ages with various problems (e.g., neurological, motor, visual, hearing, speech or language impairments) results in many difficulties for the nurse. One of them is rehabilitation nursing. rehabilitation nurses work to provide care for the patients with a temporary or permanent disability; since these patients lose autonomy either partially or completely due to the illness or accident, thus this group of nurses should have both technical skills and interpersonal and educational competencies [2]. Rehabilitation nurses are responsible for various patients suffering from different types of temporary or permanent disabilities [1].

Nursing is a stressful occupation [3, 4] and the work-related diseases in this occupation are higher than in other jobs [5]. Ergonomic issues of Work Related Musculoskeletal Disorders (WRMSDs) are high among nurses [6, 7]. In addition, nurses are exposed to other harmful physical, chemical, biological, mechanical and psychological agents in the workplace [8]. Texas Treatment Institute introduced hospitals as one of the top five risky environments with regard to injuries and occupational diseases [9]. Furthermore, nurses face heavy workloads [10], which can be associated with a negative effect on job satisfaction [11].

Previous studies reported low levels of job satisfaction [12] and the effects of workability on job satisfaction, quality of life and the factors related to cognitive failures among nurses [13, 14]. This can lead to more accidents in the workplace [15].

Thus, it can be said that nurses' safety and health is actually at risk. Nurses' safety and patients' safety are linked [16] and healthcare managers can promote the quality of services by providing a safer environment. Therefore, taking into account some macro and managerial concepts [17, 18], such as safety climate, will help to have safer workplaces [19]. Attitudes around issues in the field of safety are an essential factor of what is often called a hospital's safety culture [20]. The safety culture of organizations includes elements about healthcare provider attitudes of organizational factors such as safety climate [21].

Safety climate is the collective image of the employees about the policies, procedures, measures, and in general, the actual priority that is given to safety at work [22]. It is a multi-aspect issue that is considered as the index of safety level at work. Measuring the safety climate is comparable with assessing "safety attitude" of an organization [23]. It provides a snapshot of the safety condition of the organization [24]. One of the widely used methods for measuring safety is the assessment of people's attitudes about safety. Safety climate is the attitudes that not only can help to reduce risky behaviors but also can lead to safety condition improvement in the organization. Measuring the safety climate or people's attitude toward the safety also highlights the trends of changes in organizational safety behavior [25]. Safety climate and feeling safe at work are, in fact, the strong commitment of the organization to safety that results in proper functional feedback, development of the culture of learning from mistakes, and more attention to the personnel's comments by managers [25]. In order to conduct an accurate study on safety and causes of accidents in an organization, the estimation of safety level is initially required [26, 27]. There is a significant relationship between safety climate and predictions based on injuries at work so that 70% of occupational injuries are related to safety climate at work [25]. Poor safety climate, stress and knowledge deficits can influence patient safety negatively [28, 29]. Therefore, studying the safety climate as a key index of safety and performance in healthcare centers is critical.

Considering the mentioned issues about the importance of rehabilitation nurses and their job differences with other general nurses, this research seems to be necessary.

On the other hand, rehabilitation nurses have been considered in limited safety studies among different categories of nurses and have not been thoroughly researched. This research is needed so that occupational health and safety experts can begin to describe the impact of various factors on safety climate, especially about rehabilitation nurses. In this point of view, the present work is a novel study. So, the present study was aimed to assess the safety climate of rehabilitation nurses working in hospitals and all rehabilitation centers in Tehran in 2019.

2. Methodology

This is cross-sectional and descriptive-analytical research conducted in one rehabilitation hospital (ROFEIDEH) and some rehabilitation centers

affiliated to the University of Social Welfare and Rehabilitation Sciences. There were 140 nurses selected as the study population based on Morgan Table and using the random quota sampling method [30]. Nurses with more than one year of experience of work and without long leaves were included in the study. Approximately low response rate as limitation of the study, lead to distribute 177 questionnaires among study population to reach needed numbers of questionnaires. Finally, 140 questionnaires were correctly completed and were valid for analysis (response rates was 79%).

A demographics questionnaire and "nurses' safety climate assessment questionnaire" were used for data gathering. The nurses' safety climate assessment questionnaire comprised of 22 questions that measured six factors of safety climate of nurses, including accumulative burnout (5 questions), level of training (5 questions), communication with physicians (3 questions), relationships among nurses (3 questions), supervisors' attitude (3 questions), and error and mistake reports (3 questions) with a five-point Likert scale (1 = completely disagree, 2 = disagree, 3 = no idea, 4 = agree, 5 = completely agree). Since all the questions are positive, a higher score means a higher safety climate [31]. The validity of the questionnaire was confirmed by Content Validity Index (CVI) (= 0.77) and Factor Analysis (FA) (RSMEA = 0.05, Chi-square = 375, $p < 0.001$, df = 194, GFI = 0.92, AGFI = 0.89), and its reliability was approved by Cronbach's Alpha (= 0.79) [31, 32].

The ethical considerations such as an Informed consent form was given to all nurses and they were informed that participation in the study is voluntary. Ethical approval for the study was obtained from Bam University of Medical Sciences (IR.MUBAM.REC.1399.011). All names and other related information of participants were considered private and confidential. Besides descriptive statistics, the analyses of data were carried out using the independent *t*-test, ANOVA, Kruskal-Wallis and U Mann-Whitney test by SPSS V16 at the 5% level.

3. Results

The study included 140 rehabilitation nurses (number of complete questionnaires for analysis) of 177 who were approached. Thus, the response rate was 79.09%. The average age of male and female participants was 27.5 years ± 3.45 and 25.07 years ± 3.5 respectively; in addition, 41.7% were male and 58.3% were female; 70% were unmarried and 30% were married (Table 1). In this population, the total mean of Safety climate was 2.98 ± 0.59.

Table 1
Frequency of demographics and job specifications ($n = 140$)

Variable	Value	Frequency	Percentage
Gender	M	65	41.7
	F	75	58.3
Marital status	Unmarried	100	70
	Married	40	30
Education	Associate's degree	10	2
	Bachelor's degree	115	93
	Master's degree	15	5
Shift work	Morning	35	30
	Afternoon	15	10
	Overnight	20	20
	Rotating	70	40
Satisfaction with job	Positive	90	65
	Negative	50	35
Satisfied with colleagues	Positive	95	60
	Negative	45	40
Second job	Positive	40	25
	Negative	100	75

Results of independent *t*-tests showed the significant difference between the satisfied nurses with coworkers and the nurses who were not satisfied ($P = 0.01$); the mean score of satisfied nurses was 3.4 ± 0.81, while the mean score of the unsatisfied group was 2.95 ± 0.95. In addition, the mean score of supervisors' attitude for nurses satisfied with colleagues was 3.36 ± 0.69 but it was 2.86 ± 0.82 for nurses who were not satisfied, and the difference was also significant ($P = 0.02$). Mean score of safety climate for satisfied nurses was obtained to be 3.15 ± 0.53 and, for unsatisfied ones, it was 2.88 ± 0.58 which it was indicative of the presence of statistically significant difference ($P = 0.01$). Furthermore, responders with a second job had safety climate with a score of 3.28 ± 0.58 and nurses who did not have a second job had a mean score of 2.99 ± 0.54 and the difference between them was significant ($P = 0.02$).

4. Discussion

In this study, the mean score of safety climate was measured to be 2.98; its value in the study conducted by Sarsangi et al. was obtained to be 3.23 [32], and McCaughey et al. have obtained its value equal with 4.43 for health staff in USA clinics [33]. The reason for lower safety climate score in Iranian rehabilitation nurses, compared to American nurses, is that the

Table 2
Mean and SD of safety climate and its sub-factors

Variable	Mean	SD	Min	Max
Accumulative burnout	2.33	0.8	1	5
Level of training	3.07	0.92	1	5
Communication with physicians	2.99	0.81	1	5
Relationships among nurses	3.31	0.89	1	5
Supervisors' attitude	3.41	0.78	1	4.31
Reporting	3.71	0.77	1.39	5
Safety climate	2.98	0.59	1.61	4.46

The mean and SD of the safety climate of the rehabilitation nurses in the study was 2.98 ± 0.59.

safety in the developed world has high importance for the authorities and the personnel, which results in higher safety climate [34]. Although safety climate in our studied population was not satisfactory, it was better than the safety climate in the industry [35]. Also, the comparison of total safety climate scores between men and women depicts that they are the same and it is in line with findings of Khandan et al. [17, 36].

The sub-factor of reporting the errors and mistakes obtained the highest score (Table 2); it seem for type of rehabilitation nurses task while Sarsangi et al. indicated that communication with nurses obtained the highest score [31]. The attitude of managers and supervisors is critical to have high levels of safety for both patients and staff. Snijders et al. found that reporting behavior could be promoted by the management support of patient safety, a no punitive manner towards mistakes, and the perception of patient safety [37]. Good communication with supervisors and being in good state about Supervisors' attitude, as second ranked sub-factor, are to be main factors of reporting errors. Medication errors influence the workplace and patient safety significantly. Reporting the errors is fundamental for error prevention. Errors, whether they cause harm to patients or not, are led to numerous problems in the system, such as poor safety culture and the presence of unfavorable working conditions for nurses [38].

Our results showed that the lowest mean score was related to accumulative burnout (2.66), which means that burnout was the worst condition compared to other sub-factors of the safety climate. On the other hand, it was related to having a second job and nurses who worked in second jobs experienced higher burnout. Therefore, it could be a main cause for high cumulative burnout among studied nurses [39]. Sarsangi et al. [31] in Iran and Ballangrud et al. [40] in Sweden reported that the lowest score was obtained by reporting the errors and mistakes, while this factor obtained the highest score in our study. The result was consistent with Kavari et al. [41] and was inconsistent with some other studies [42–44]. Moreover, Kudo et al. conducted a study in Japanese hospitals and found that communication with nurses obtained the lowest score [45].

This inconsistency can be explained by the different work conditions. Being satisfied with coworkers as one of the job satisfaction aspects [46] that had an effect on the safety climate. It was in line with previous studies conducted in healthcare centers [47] as well as industries [48].

Satisfied people had a higher mean score (3.15 ± 0.53 vs. 2.88 ± 0.58). In addition, the communication with nurses, and the supervisors' attitude were different between satisfied and unsatisfied people ($P < 0.05$). Nurses satisfied with co-workers had higher scores in both factors. "Supervisors' attitude" in this study means the lack of alerting the nursing staff by superiors about the occurrence of an error, lack of attention and listening to the opinions of nursing staff about the patient safety by supervisors.

Leurer et al. emphasized that consultation and communication with nurses, identification of nurses by superiors, supportive management and considering opportunities for the professional development of nurses are the effective strategies to keep nurses in their jobs [49]. "Communication with nurses" focuses on helping each other, and having acceptable communication among nurses. The open communication process plays an important role in the patient care process and will improve patient's safety. The lack of communication is one of the causes of preventable mistakes in health care centers. Supervisors must be able to create teamwork and open communication among employees. Moreover, the participation of employees in decision making is very important [50]. In addition, Communication with physicians is critical, but this factor had a mean score lower than its middle score (2.89 compared with 3). The "Communication with physicians" also means that physicians and nurses have good work relationships and nurses have access to them in an emergency. This cooperation is good not only for the medical and nursing staff but also is helpful to the patients. Kudu et al. reported that communication with physicians is effective in providing patient safety and the nurses know it as an important factor in preventing mistakes [45]. Since, in the present study, it is at a low level, it could negatively affect the safety of patients and quality of services in the hospitals. Furthermore, having a second job made a difference in three factors of supervisors' atti-

Table 3
Comparing safety climate and its aspects based on demographics and occupational factors

		Accumulative burnout	Sig	Level of training	Sig	Communication with physicians	Sig	Communication with nurses	Sig	Supervisors' attitude	Sig	Reporting errors and mistakes	Sig	Safety climate	Sig
Gender	M	2.68 ± 0.87	0.84	3.11 ± 0.97	0.86	2.97 ± 0.86	0.35	3.21 ± 0.92	0.69	3.16 ± 0.96	0.06	3.53 ± 0.8	0.61‡	3.06 ± 0.61	0.99
	F	2.65 ± 0.93		3.07 ± 0.90		2.82 ± 0.86		3.28 ± 0.86		3.22 ± 0.62		3.43 ± 0.73		3.06 ± 0.52	
Marital status	Unmarried	2.61 ± 0.86	0.35	3.1 ± 0.91	0.89	2.94 ± 0.87	0.35	3.34 ± 0.84	0.09	3.28 ± 0.75	0.46	3.47 ± 0.72	0.65‡	3.07 ± 0.53	0.48
	Married	2.71 ± 1.1		3.7 ± 0.99		2.77 ± 0.84		3.03 ± 0.97		2.97 ± 0.78		3.47 ± 0.76		3.02 ± 0.63	
Education	Associate's degree	3.6 ± 0.52	0.19	3.5 ± 0.50	0.56†	2.55 ± 0.50	0.68	3.55 ± 0.50	0.72	2.55 ± 0.69	0.08	3.88 ± 0.19	0.43†	3.4 ± 0.4	0.45
	Bachelor's degree	2.63 ± 0.89		3.07 ± 0.95		2.97 ± 0.87		3.25 ± 0.88		3.24 ± 0.75		3.48 ± 0.74		3.06 ± 0.56	
	Master's degree	2.7 ± 1.2		3.5 ± 0.34		2.6 ± 0.86		3 ± 1.3		2.4 ± 0.83		2.9 ± 1.25		2.8 ± 0.58	
Shift work	Morning	2.76 ± 0.79	0.77	3.17 ± 0.65	0.31	2.85 ± 0.79	0.87	3.28 ± 0.72	0.96	3.29 ± 0.68	0.73	3.5 ± 0.64	0.99†	3.11 ± 0.43	0.87
	Afternoon	2.85 ± 0.44		2.25 ± 0.75		2.58 ± 0.73		3.08 ± 0.91		3.16 ± 0.63		3.58 ± 0.68		2.88 ± 0.54	
	Overnight	2.44 ± 0.81		3.18 ± 1.06		3 ± 0.88		3.16 ± 0.89		3.2 ± 0.84		3.5 ± 0.59		3 ± 0.61	
	Rotating	2.61 ± 0.97		3.01 ± 0.95		2.84 ± 0.89		3.22 ± 0.88		3.14 ± 0.74		3.34 ± 0.83		3 ± 0.55	
Satisfaction with job	Positive	2.6 ± 0.87	0.29	3.19 ± 0.88	0.08	2.88 ± 0.85	0.92	3.29 ± 0.87	0.49	3.26 ± 0.74	0.07	3.48 ± 0.77	0.87‡	3.09 ± 0.52	0.44
	Negative	2.8 ± 0.97		2.86 ± 0.97		2.9 ± 0.88		3.17 ± 0.92		3.04 ± 0.71		3.46 ± 0.76		3 ± 0.64	
Satisfied with colleagues	Positive	2.7 ± 0.86	0.56	3.2 ± 0.88	0.08	3 ± 0.85	0.06	3.4 ± 0.81	**0.01***	3.36 ± 0.69	**0.02***	3.51 ± 0.73	0.45‡	3.15 ± 0.53	**0.01***
	Negative	2.5 ± 1		2.87 ± 0.98		2.67 ± 0.85		2.95 ± 0.95		2.86 ± 0.82		3.4 ± 0.73		2.88 ± 0.58	
Second job	Positive	2.97 ± 0.91	0.05	3.36 ± 0.84	0.1	2.98 ± 1.07	0.54	3.38 ± 0.79	0.41	3.38 ± 0.85	**0.04***	3.65 ± 0.77	0.15‡	3.28 ± 0.58	**0.02***
	Negative	2.57 ± 0.89		3.01 ± 0.94		2.86 ± 0.79		3.21 ± 0.91		3.14 ± 0.74		3.42 ± 0.75		2.99 ± 0.54	

†Kruskal-Wallis ‡U Mann-Whitney * Significant at 5% level.

tude, cumulative burnout, and total safety climate. Burnout in the workplace is the fatigue or exhaustion of working in a stressful environment that can lead to frustration and anti-social behaviors among staff [51] and decrease work performance quality [52].

People with a second job have a higher load of work usually. The previous study illustrated that job burnout had a positive correlation with work, and an increase in the employees' workload led to increasing job burnout [53]. Also, it was reported that workload is positively related to emotional exhaustion. Emotional exhaustion leads to cynicism and somatization, and cynicism is negatively related to nurses' professional efficacy [54].

5. Conclusion

To date, the authors have not found any study about the measurement of safety climate among rehabilitation nurses. Thus, the findings of the present study can be considerable. The results showed safety climate in nurses was lower than the middle score (2.98 vs. 3) indicating it was not at an acceptable level. Taking into account the effects of poor safety climate on the performance of nurses, service quality and patient safety, the promotion of safety culture/climate in studied hospitals is vital and important. Creating a positive and supportive safety culture through advertising, holding routine meetings with personnel, rewarding safety behaviors, cultural works, converting safety behaviors into norms and safety beliefs, improving workplace safety, reforming unsafe beliefs (e.g. unavoidability of accidents and the personnel who do not care about their safety), creating mental security by providing timely aids in the case of accidents and supporting the victims of accidents until full recovery are suggested.

Conflict of interest

None to report.

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