



Attitudes of Healthcare Professionals and Internship Students Toward Patient Safety During the COVID-19 Pandemic in Qom, Iran, 2021

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Received 2023 February 08; Revised 2023 October 08; Accepted 2023 October 17.

Abstract

Background: The main problems endangering patient safety are errors and accidents caused by healthcare providers, mainly due to their unfavorable patient safety attitudes.

Objective: This research aims to investigate the attitudes of healthcare professionals and internship students toward patient safety during the COVID-19 pandemic.

Methods: A cross-sectional study was conducted. Using the convenience sampling method, 232 healthcare professionals and students under training and internships were selected in intestinal care units, general wards, and operating room departments in 3 teaching hospitals affiliated with Qom University of Medical Sciences, Qom, Iran. Data gathering was performed during August and September 2021, when the majority of visits to the hospitals were related to patients with COVID-19. The inclusion criteria included medical staff and students with at least six months of work experience in hospitals admitting COVID-19 patients. The exclusion criteria were unwillingness to participate, withdrawal from the study, and not completing the research. The Data collection tool was the Safety Attitude Questionnaire.

Results: Most of the study participants were nurses (73.27%), women (55.60%), married (56.47%), and with lower incomes than expenses (50%). The mean safety attitude score of the participants was 99.07 ± 16.31 . Average scores of safety attitude in groups of nurses, nursing internship, operating room nurses, and operating room internship were 98.69, 100.26, 108.16, and 96.40, respectively. Pearson correlation test showed no significant correlation between the safety attitude scores of healthcare professionals and their age ($P=0.652$) and work experience ($P=0.441$). Based on the Kruskal-Wallis test, the income status perception of the study participants was significantly correlated with their safety attitude scores ($P=0.001$).

Conclusions: The COVID-19 pandemic had not a significant effect on the attitude of healthcare professionals in comparison with previous studies. However, in this study, the attitudes of the healthcare professionals and interns were inappropriate. It is recommended that specialized training courses on how to deal with crises such as pandemics be planned and held for healthcare providers.

Keywords: Safety Attitude, COVID-19, Healthcare Professionals, Internship Students

1. Background

One of the most critical issues in providing safe medical services is patient safety (1). Patient safety can be described as the prevention and reduction of preventable risks and injuries when providing medical services (2). Preventing adverse events and increasing the quality of clinical services are essential measures that should be taken, considering the importance of patient safety (3). In addition, unsafe health care is one of the top ten causes of disability and death, causing approximately 64 million disabilities worldwide yearly. Studies in US hospitals have

shown that harm reduction strategies can decrease total healthcare costs by up to \$108 million (4).

According to recent studies, several factors influence the attitude toward patient safety (5). Niknejad et al. found that one of the significant issues endangering patient safety is errors and accidents caused by healthcare providers, which are mainly due to their unfavorable attitudes toward patient safety (6). El Shafei and Zayed showed that providing medical services in a stressful environment may increase errors and injuries (7). A study conducted by Denning et al. found that the safety attitudes of medical staff may be associated with psychological

consequences of stress, such as job burnout, anxiety, and depression (8).

The emergence of COVID-19 greatly increased the workload of medical staff, and the risk of infection and transmission of the disease to others through direct contact was very high. As a result, medical staff experienced unprecedented amounts of psychological stress associated with the challenges of the disease (9). In addition, the lack of necessary resources exacerbated feelings of emotional distress and job burnout among healthcare providers (10). The combination of these factors was associated with adverse effects on the medical staff, which in some cases led to reduced patient satisfaction, increased medical errors, increased rate of infection, and increased mortality (11). This situation has constraints on healthcare providers worldwide, and changes in safety attitudes could be considered as one of its consequences (8).

Although some other studies have been conducted to investigate healthcare professional attitudes towards patient safety in Iran (6, 12-14), several discrepancies were observed regarding the factors affecting the safety attitude of different groups of healthcare professionals. Furthermore, the comparison between the attitudes of healthcare professionals and internship students toward patient safety during the COVID-19 pandemic has not been studied yet. With the aim of filling this gap, we designed and conducted this study.

2. Objective

This study aimed to evaluate the attitudes of nurses, operating room nurses, nursing interns, and operating room nursing intern students regarding patient safety during the COVID-19 pandemic.

3. Methods

This cross-sectional study was performed on healthcare professionals and students under training and internships during August and September 2021 in hospitals affiliated with Qom University of Medical Sciences, Qom, Iran.

The study population included healthcare professionals and students, including nurses, operating room nurses, interns of nursing, and operating room nursing intern students. Inclusion criteria included medical staff and students with at least 6 months of work experience in hospitals admitting COVID-19 patients, and exclusion criteria included unwillingness to participate in the study, withdrawal from cooperation during the study,

and not completing the research. Using the convenience sampling method, 232 healthcare professionals and students under training and internships were selected in intestinal care units, general wards, and operating room departments in three teaching hospitals. The sample size was calculated as 235 subjects using a formula based on a previous study by Önlüer and Akyolcu, taking into account the mean and standard deviation (Mean \pm SD = 59.22 \pm 13.22), a margin of error of %5, a confidence level of 0.90, and drop in a sample of %25 (15). Out of 235 invited participants, 232 completed the survey, and in the end, 232 questionnaires were collected.

The data collection tool consisted of two main parts. The first part consisted of 6 items related to demographic characteristics, including age, work experience, gender, specialty, income status perception, and marriage. The second part consisted of the Safety Attitude Questionnaire (SAQ), which was designed by Sexton et al. (16). The reliability and validity of its Persian version were confirmed by Tourani et al. by calculating Cronbach's alpha coefficient of 86% (17). The goodness-of-fit index from the CFA showed a well-founded model fit (CFI=0.8, ECVI=0.8, and RMSEA=0.02) for the SAQ tool (18). This tool has been previously used to investigate the safety attitude of nursing students (19). This questionnaire contains 30 items and 6 dimensions, including teamwork climate, safety climate, job satisfaction, stress recognition, perceptions of management, and working conditions. The response scale of the questionnaire items is a 5-point, positively-packed, Likert-type rating scale ranging from 1 (strongly disagree) to 5 (strongly agree) (6). Therefore, the maximum and minimum possible score is 150 and 30, respectively. Based on the questionnaire manual, the subscale scores and the total score were calculated out of 100. Therefore, the whole scale and subscales are scored between zero and 100, and scores over 75 are considered favorable and positive attitudes toward patient safety (15, 20).

Data were collected after obtaining the approval of the Ethics Committee of Qom University of Medical Sciences for the research proposal (No. IR.MUQ.REC.1399.182). Researchers then referred to the study settings, found eligible subjects conveniently, briefed them and their caregivers about the objectives and process, invited them to participate, ensured them that the data would be kept confidential, and asked them to sign the informed consent form.

The questionnaires were then presented to the healthcare professionals and internship students, and they took about 15 to 20 minutes to complete. After collecting the questionnaires, incomplete samples were removed from the study, and the remaining samples were

coded for statistical analysis.

Data analysis was performed by IBM SPSS statistical software version 23. Demographic data and safety attitude scores were described using descriptive statistics, including mean, percentage, frequency, and standard deviation. The normality of the data was checked using the Kolmogorov-Smirnov test. As some of the data (income status perception and marriage) did not show normal distribution and equal variance was not assumed, parametric and nonparametric statistical test methods were used in data analysis. In addition, inferential statistics were used to examine the association between demographic variables and safety attitude scores. The correlation between the 6 dimensions of the questionnaire and also between participants' ages and total safety attitude scores was analyzed using the Pearson correlation test. ANOVA, independent *t*-test, Kruskal-Wallis H, and Mann-Whitney U test were used to analyze the specialty, gender, income status perception, and marital status of participants with total safety attitude scores, respectively.

4. Results

Most of the participants were nurses (73.27%), women (55.60%), married (56.47%), and with lower incomes than expenses (50%) (Table 1). The mean age of the participants and their work experience were 30.64 ± 7.48 and 7.03 ± 6.74 years, respectively (Table 1). The highest mean score percentages were related to the stress recognition (71.98%) and teamwork climate (70.71%) dimensions, respectively, and the lowest mean percentages were related to the perceptions of management (53.94%) and working conditions (59.31%) dimensions, respectively (Table 2). Pearson correlation test showed no significant association between safety attitude scores and the healthcare professionals' age ($P = 0.652$) and work experience ($P = 0.441$). Independent samples *t*-test and Mann-Whitney U test results showed no significant association between safety attitude scores and gender ($P = 0.856$) and marital status ($P = 0.536$). However, the Kruskal-Wallis H test showed that the income status perception of the study participants was significantly correlated with their safety attitude scores so that the mean safety attitude scores of medical staff with lower incomes than expenses were lower compared to the other groups ($P = 0.001$). ANOVA test showed that the mean attitude score did not significantly differ between specialty subgroups of participants ($P = 0.065$). Moreover, based on the Pearson correlation, there was a significant association between the dimensions of the questionnaire, except for the stress recognition dimension (Table 2).

Table 1. Distribution of Frequency and Numerical Index of Personal and Occupational Characteristics and Patient Safety Attitude Score Mean in Each Group

Demographic characteristics	No. (%)	Mean \pm SD
Age (y)		30.64 ± 7.48
Work experience (y)		7.03 ± 6.74
Gender		
Female	129 (55.60)	99.24 ± 14.94
Male	103 (44.40)	98.85 ± 17.95
Specialty		
Nurses	170 (73.27)	98.69 ± 16.97
Nursing internship	23 (9.91)	100.26 ± 9.39
Operating room nurses	12 (5.17)	108.16 ± 11.05
Operating room internship	27 (11.63)	96.40 ± 17.78
Income status perception		
Income equal to expenses	111 (47.84)	102.68
Income less than expenses	116 (50.00)	95.42
Income more than expenses	5 (2.16)	103.60
Marriage		
Single	101 (43.53)	99.77
Married	131 (56.47)	98.53

Abbreviation: SD, standard deviation.

5. Discussion

The mean safety attitude score of the participants in this study was 66.04%. According to the studies conducted before the COVID-19 epidemic in Iran, the safety attitude of healthcare professionals was not appropriate (21). Safety attitude scores in similar studies before the pandemic were close to the present study (6, 12). Although it was envisaged that the COVID-19 pandemic would have affected the attitudes of medical workers, the results showed the opposite. However, the findings of the current study demonstrated that many healthcare professionals were not prepared to deal with such conditions. The COVID-19 outbreak exposed the weaknesses of work organizations in healthcare facilities, and organization security failures threaten patient safety (22).

In the present study, the mean attitude score did not significantly differ between specialty subgroups of participants ($P = 0.065$). However, the highest mean score was related to the operating room nurses, and the lowest mean score was related to the group of operating room interns. The higher scores of nurses in operating room departments can be attributed to their lack of direct involvement in caring for COVID-19 patients. After the COVID-19 outbreak in Iran, operating room nurses were less involved in caring for COVID-19 patients than

Table 2. Internal Consistency and Mean and Standard Deviation of SAQ Items Belong to Nurses

Domain ^a	Teamwork Climate	Safety Climate	Perceptions of Management	Job Satisfaction	Working Condition	Stress Recognition	Mean ± SD	Mean (%)
Teamwork climate	1						21.21± 4.55	70.71
Safety climate	< 0.001 ^b	1					23.54± 4.67	67.26
Perceptions of management	< 0.001	< 0.001	1				10.78± 2.69	53.94
Job satisfaction	< 0.001	< 0.001	< 0.001	1			17.26± 4.48	69.06
Working condition	< 0.001	< 0.001	< 0.001	< 0.001	1		11.86± 3.41	59.31
Stress recognition	0.989	0.582	0.719	0.863	0.146	1	14.39± 3.94	71.98
Total							99.07± 16.31	66.04

^a All the analyzed data in Table No. 2 had a normal distribution, and therefore, a parametric test was used to analyze them (Pearson correlation)

^b Correlation is significant at the 0.05 level (2-tailed).

nurses in general wards because most COVID-19 patient care was carried out in general wards and intestinal care units. In the same way, the lower scores of the group of nursing interns in the operating room can be due to their temporary exclusion from going to the hospital due to the high prevalence of the epidemic. At the same time, many nursing interns participated with nurses in caring for COVID-19 patients due to the lack of human resources.

In a survey by Tocco et al., the highest and lowest average scores of safety attitude dimensions were allocated to the stress recognition and perceptions of management dimensions, respectively (23). Similarly, in the present study, the lowest and highest average score percentages were allocated to the management (53.94%) and stress recognition (71.98%) dimensions, respectively. In another study by Al-Malki et al., the working conditions and management dimensions were evaluated with a shallow response rate (24). The low scores in the management dimension could be attributed to the long distance between the hospital's management and operational department and, therefore, its weak supportive role from the personnel viewpoint. However, previous studies have shown the crucial role of management in creating and promoting a safety culture that could be associated with reducing medical errors (25). Efficient management, favorable working conditions, and sufficient evidence-based knowledge of the medical staff are among the factors that effectively promote patient safety, considering its multidimensionality (26).

Arkam et al. showed that safety attitude scores increased with the increasing work experience of frontline healthcare workers (27). However, in the current research, there was no meaningful association between the work experience of healthcare professionals and their safety

attitudes ($P = 0.441$), which could be due to the low work experience of the study participants. Cheng et al. showed that the average safety attitude scores were significantly correlated with the gender and age of medical staff, so with increasing age, the mean safety attitude scores also increased, and men had better mean safety attitude scores than women (28). It was expected that safety attitude scores would be lower in the female group because they experienced more impact than males due to the difficult conditions of the pandemic, such as burnout and distress (8, 29, 30). Still, in the current study, there was no meaningful association between age ($P = 0.652$), gender ($P = 0.856$), and marital status ($P = 0.536$) of medical staff and their safety attitude scores, and these findings are similar to Salih et al. study (31).

In a study by Pimentel et al. (32), the safety attitude scores of surgeons, nurses, and surgical technicians were significantly different. Similarly, in a study by Marsteller et al., surgeons and support staff gained higher mean safety attitude scores than operating room nurses, perfusionists, and anesthesiologists (33).

Van Melle et al. reported socio-economic conditions as practical factors in shaping the concept of patient safety (34). Kang et al. also showed that complex socioeconomic factors affected patient safety culture in different countries (35). In a study by Ozer et al., no significant correlation was found between economic status perception and safety attitudes (36); however, in the present study, the income status perception of the study participants was significantly correlated with their safety attitudes ($P = 0.001$), so that the mean safety attitude scores of medical staff with lower incomes than expenses were lower compared to the other groups. Satisfactory living conditions of medical staff could effectively motivate them

to consider patient safety during healthcare activities in the medical environment; this could well explain the significant association found in this study between safety attitude scores and income status perception.

5.1. Conclusions

The findings of the current study showed that healthcare professionals were not prepared to deal with COVID-19. So far, no study has been conducted to investigate and compare the attitude of health specialists in the groups of personnel and students; therefore, the results reported here represent some of the first data on the topic. According to the results, it is recommended that specialized training courses on how to deal with crises and medical emergencies be planned and implemented for healthcare providers, especially in groups of students, to maintain patient safety.

5.2. Limitations

We have not included all the medical specialties, such as pharmacists, physicians, and dentists, and more studies in this field are needed in other groups involved in the treatment of patients.

Acknowledgments

We would like to thank each and every one of the Healthcare Professionals and internship Students for sharing their feelings and experiences with us.

Footnotes

Authors' Contribution: I.K. conceived and designed the evaluation and drafted the manuscript. M.A. participated in designing the evaluation, performed parts of the statistical analysis, and helped to draft the manuscript. S.A.B. re-evaluated the clinical data, revised the manuscript, performed the statistical analysis, and revised the manuscript. A.M. collected the clinical data, interpreted them, and revised the manuscript. S.A.B. re-analyzed the clinical and statistical data and revised the manuscript. All authors read and approved the final manuscript.

Conflict of Interests: The authors of this study hereby declare that they have no conflicts of interest to disclose.

Data Reproducibility: The datasets utilized and/or examined in the present study are accessible upon reasonable request from the corresponding author.

Ethical Approval: This study is approved under the ethical approval code of [IR.MUQ.REC.1399.182](https://doi.org/10.1399/IR.MUQ.REC.1399.182).

Funding/Support: The authors received no financial support for the research and/or authorship of this article.

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