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Medication safety climate from the perspectives of healthcare providers: A cross-sectional study

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Abstract:

BACKGROUND: Medication safety as an indicator of care quality is the measures taken by healthcare team members to prevent or adjust adverse drug events at the time of medication administration. This study was conducted to investigate the medication safety climate from healthcare providers' perspectives.

MATERIALS AND METHODS: This cross-sectional descriptive study was conducted in a selected educational hospital affiliated with the Isfahan University of Medical Sciences, Isfahan, Iran, in 2021. Participants were healthcare providers who are involved in the medication process. The sampling was done using the quota method. The study instruments were a demographic questionnaire and the Medication Safety Climate (MSC).

RESULTS: The total mean of positive responses to MSC items was 64.11%, denoting a moderate-level MSC. Collected data were managed using the SPSS software (v. 16.0) and were summarized using the measures of descriptive statistics, namely mean, standard deviation, frequency, and percentage. The lowest and the highest dimensional mean scores were related to the management support for medication safety dimension (mean: 48.42%) and the Teamwork dimension (mean: 80.43%), respectively.

CONCLUSION: Managers' inattention and insufficient understanding of safety provide the basis for medication errors and threaten patient safety. Healthcare team members are highly motivated to provide quality and safe care by observing the managers' positive performance regarding patient safety. To improve the medication safety climate, healthcare team members are required to work in a safe workplace and have sufficient job satisfaction. Health center managers need to employ a proactive approach to prevent errors.

Keywords:

Climate, culture, health personnel, medication errors, patient safety

Introduction

Patient safety is considered a priority in healthcare centers.^[1] By placing emphasis on the care delivery system, the Institute of Medicine (IOM) defines safety as preventing harm to patients, including preventing errors, learning from errors that occurred, and creating a safety culture in organizations. In order to create a safe environment, a seven-step

safety model has been proposed, one of which is a safety culture.^[2] Patient safety culture is individuals' set of beliefs, opinions, and group values reflected in their behavior and represents the priority placed on patient safety from healthcare team members' perspective in the ward and organization.^[3] The safety culture consists of three components: Just culture, reporting culture, and learning culture. A culture of reporting events is a prerequisite for acquiring the learning culture and is

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only created in an organization with a non-punitive environment, where individuals can report their errors without feeling embarrassed.^[4]

Medication safety as an indicator of care quality is the measures taken by healthcare team members to prevent or adjust adverse drug events at the time of medication administration.^[5]

Since March 2017, the World Health Organization (WHO) has focused on medication without harm highlighting medication safety with the aim of reducing preventable medication errors by 50% by 2022.^[6,7]

Medication safety improvement strategies require a better understanding of the safety culture, particularly regarding medicines.^[8] A positive safety culture helps prevent events and promotes the care provided.^[9] A direct relationship has been reported between safety culture and reduced medication errors, adverse events, length of hospital stay, and mortality.^[10] In addition, studies show that in environments with a positive safety culture, the rate of reporting adverse drug events is higher.^[8]

Pharmacotherapy consists of various stages such as prescribing, transcribing, preparation, administration, and monitoring. In each stage lies a possibility of error. Medication errors are the leading cause of side effects in the patient, followed by hospitalization and disability, and 6.5% of patient mortality.^[11] Approximately 400,000 medication errors are reported annually in the United States,^[12] and according to reviews, the prevalence of medication errors in Middle Eastern countries, including Iran, is 7% to 90%.^[13] Farzi *et al.* (2018)^[14] investigated medication errors in different stages of pharmacotherapy from the perspective of physicians, nurses, and clinical pharmacists. The study results showed that 92.0% of the participants reported at least one case of medication error in a month, indicating a high incidence of medication errors in healthcare centers.

Assessing safety culture identifies aspects of patient safety that require closer attention and allows healthcare managers to identify the strengths and weaknesses of safety culture. Therefore, healthcare centers are required to regularly evaluate and improve the safety culture.^[15] Medication safety programs can include changing approaches, training, and creating a safety culture. A better understanding of safety culture, particularly medication safety, is crucial.^[8] Consequently, the present study was conducted to investigate the medication safety climate from healthcare team members' perspectives.

Materials and Methods

Study design and setting

This cross-sectional descriptive study was conducted in a selected educational hospital affiliated with the Isfahan University of Medical Sciences, Isfahan, Iran, during October to November 2021.

Study participants and sampling

Participants were physicians, nurses, midwives, pharmacists, as well as anesthesiology, operating room, and medication technicians who are working in a selected educational hospital affiliated with the Isfahan University of Medical Sciences, Isfahan, Iran. The sampling method was census. Inclusion criteria were a work experience of at least 3 months in the study setting and agreement for participation. Out of the 250 eligible healthcare providers in the selected hospital, 230 people accepted to participate in the study and 17 people declined to participate in the study. In total, 213 healthcare providers completed the questionnaire in full, and six participants who incompletely answered the study instruments were excluded.

Data collection tool and technique

The study instruments were a demographic questionnaire and the Medication Safety Climate (MSC). For data collection, we referred to the study setting, recruited eligible healthcare providers, and asked them to complete the study instruments. We explained the objectives of the study to participants and also stated that participation in the study is optional. In order to maintain confidentiality, a numeric code was used instead of participants' names.

Demographic characteristics questionnaire

This questionnaire (five items) is related to demographic variables (gender, age, level of education, work experiences, and professional group).

Medication safety climate (MSC)

The MSC was developed in 2015 by Kantilal *et al.* (2015).^[8] After obtaining permission from the primary designer of the MSC, the translation process was performed based on the Brislin translation model.^[16] Two bilingual translators who were fluent in Persian and English performed the translation and back-translation of the scale. Initially, the first translator who also was an expert in medication safety translated the original version of the scale from English into Persian. Then, the second translator, who did not know about the original scale, back-translated the Persian translation of the scale into English. This new English translation along with the original English scale and the Persian translation was shared with a group of experts to fix the bugs and confirm the analogy of the two English versions and the congruence of the Persian translation with them. MSC assesses medication safety

climate in nine dimensions, namely teamwork (six items), safety climate (seven items), job satisfaction (five items), stress recognition (four items), perception of management (11 items), working condition (three items), organizational learning (three items), feedback and communication about the error (three items), and management support for patient safety (three items). Items are scored on a 5-point scale from 1 ("Strongly disagree") to 5 ("Strongly agree"). The total score of the questionnaire is calculated by averaging the percent of positive responses to the items and is interpreted as follows: More than 75.0% positive responses: Good PSC; 50.0%–75.0% positive responses: Moderate PSC; and less than 50.0% positive responses: Poor PSC.^[8]

The validity and reliability of the Persian version of the MSC were examined after obtaining permission from the original author. Face validity was performed by consulting 15 experts in medication education and safety, and the impact score of all items was greater than 1.5. The content validity was assessed by consulting 12 experts in patient education and safety. The Content Validity Index (CVI) score was calculated to be 0.98, and the Content Validity Ratio (CVR) score was between 0.64 and 1. We assessed the reliability of the questionnaire by test-retest. Cronbach's alpha Coefficient was 0.955, and Pearson's correlation Coefficient based on test-retest results was $r = 0.913$, respectively.

Statistical analysis

Collected data were managed using the SPSS software (v. 16.0) and were summarized using the measures of descriptive statistics, namely mean, standard deviation, frequency, and percentage.

Ethical considerations

This study was approved by the ethics committee of the Isfahan University of Medical Sciences (IR.MUI.MED.REC.1399.533). Participants were informed about the study aim, confidential management of the study data, and anonymity of the study instruments.

Results

Participants' characteristics

Table 1 shows participants' characteristics. In total, 213 healthcare providers completed the study. Most participants were female (70.0%) and nurse (66.3%). The mean of their age was 38.20 ± 8.06 years.

The total mean of positive responses to MSC items was 64.11%, denoting a moderate-level MSC. The lowest and the highest dimensional mean scores were related to the management support for medication safety dimension (mean: 48.42%) and the Teamwork dimension (mean: 80.43%), respectively [Table 2].

Table 1: Participants' characteristics

Characteristics	n (%)
Gender	
Men	149 (70.0)
Women	64 (30.0)
Age in years	
23-40	112 (52.6)
40-63	101 (47.4)
Level of education	
Associate Diploma	19 (8.9)
Bachelor's	154 (72.3)
Master's	18 (8.5)
Doctoral or Ph.D	22 (10.3)
Work experience (Years)	
<1	17 (8.0)
1-10	82 (38.5)
10-20	80 (37.5)
≥20	34 (16.0)
Professional group	
Nurse	141 (66.3)
Physician	22 (10.3)
Physiotherapist	7 (3.3)
Radiology Technician	3 (1.4)
Laboratory Technician	10 (4.7)
Medication Technician	2 (0.9)
Operation Room Technician	9 (4.2)
Other	19 (8.9)

*n: Number

Table 2: The mean scores of positive responses to the nine dimensions of MSC

Dimensions	Mean of Positive Responses
Teamwork	80.43%
Safety climate	65.95%
Job satisfaction	69.95%
Stress recognition	69.90%
Perceptions of management	49.34%
Working conditions	66.33%
Organizational learning	62.68%
Feedback and communication about error	78.77%
Management support for medication safety	48.42%
Total score of medication safety climate	64.11%

*MSC: Medication Safety Climate

Discussion

Safety climate is imperative in healthcare organizations since it influences staff performance and patients' health. Besides, its evaluation from the care providers' perspective is beneficial in determining the priorities of health organizations.^[17] This study aimed to evaluate the medication safety climate in a selected hospital affiliated with the Isfahan University of Medical Sciences, Isfahan, Iran, from the healthcare providers' perspective. The present study results showed that the mean score of the studied subjects' positive responses was 64.11%, indicating a moderate level of medication safety climate.

The results of a similar study conducted in two hospitals in London showed a good medication safety climate.^[8]

In the present study, the mean score of teamwork was at a good level and in line with other studies.^[8] Recognition of teamwork among healthcare providers is essential for patient safety. The Institute of Medicine (IOM) report, *To Err is Human*, was one of the first studies to highlight the significance of teamwork in error prevention.^[18] Safe medication administration requires the promotion of teamwork.^[19] A study showed that poor physician-nurse communication, including lack of transparency in medication prescriptions due to nurses' communication problems with physicians, led to medication errors since nurses administered medications based on their presumptions.^[20] Consequently, consolidating teamwork in hospitals can be advantageous in reducing medication errors and thus medication safety.

In this study, the mean score of feedback and communication about the error was at a good level. Providing feedback is particularly important for error detection and performance improvement.^[21] Feedback provision in a receptive and amiable environment leads to significant changes in reducing medication errors.^[22] Therefore, by receiving appropriate and timely feedback on their performance, healthcare team members may take steps to improve medication safety and quality of care.

In this study, the score of safety climate was moderate. Healthcare providers were not supported after expressing medication safety concerns. In addition, it was challenging for them to discuss medication errors, and they had no knowledge of the right medium to directly raise questions concerning medication safety. Consistent with the results of our study, in a qualitative study, participants stated that, due to a lack of support from managers, they did not report their medication errors.^[23] Fear of being denounced or judged and losing a job, as well as managers' mistreatment, have been among the reasons for nurses' refusal to disclose medication errors and medication safety issues.^[24] Increasing medication error reporting is beneficial in preventing error recurrence. Moreover, analyzing errors recorded in medical error reporting systems can reduce the rate of medical errors. Therefore, hospital and nursing managers ought to support nurses and other healthcare providers who report medication errors.^[17,25]

The study results indicated that the medication safety climate was moderate regarding job satisfaction. Job satisfaction is affected by the work environment, and regarding nurses and other healthcare providers, it is directly associated with patient safety.^[26] Healthcare managers can increase healthcare team members'

satisfaction and improve patient outcomes by employing transformational leadership,^[27] thus increasing the safety of their hospital. In the present study, the medication safety climate was moderate in the stress recognition dimension. High workload, fatigue, and stressful work environment have an impact on reducing the medication safety climate. According to Processing Efficiency Theory, negative emotions such as anxiety, worry, or rage reduce decision-making power.^[28] In healthcare team members, the burden of work leads to stress impaired decision-making, and thus reduced quality of care.^[29,30] In a study, a participant had set 230 cc of lidocaine instead of 23 cc of lidocaine per hour for the patient due to fatigue, high workload, and insufficient rest and committed a medication error.^[20] Therefore, the head nurse can help reduce fatigue and prevent medication errors by setting a proper work schedule.

Based on our study findings, the medication safety climate was weak in the two dimensions of "perception of management" and "management support for patient safety," indicating the insufficient attention of healthcare center managers to medication safety and providing a safe environment. Providing quality care is one of healthcare managers' ethical and legal requirements. Other studies, likewise, show that most managers do not pay adequate attention to safety. Due to the significance of financial issues, the largest part of managers' meetings and concerns are devoted to such issues.^[31] In the present study, the score of working conditions from the participants' perspective was moderate. This dimension deals with the training of new staff and monitoring their performance. Studies show that inadequate monitoring of new healthcare team members' performance leads to numerous medication errors.^[20] Training a novice healthcare team improves skills and adaptation to the new work environment. Training has a role in bridging the gap between theory and practice and improving care quality.^[32] Furthermore, the medication safety climate in the organizational learning dimension was moderate. Improving medication safety and positive changes following medication errors are emphasized in this area. In the study by Kantilal *et al.*,^[8] this dimension was reported to be at a good level. In order to learn from the error, medication errors must be reported, and root cause analysis (RCA) be performed.^[33] Identifying the causes of medication errors has enabled nurses to identify error prevention measures.^[20] Such measures indicate positive changes following the occurrence of medication errors.

Limitations and recommendation

One of the strengths of this study is that it is the first in Iran to investigate the medication safety climate from the perspective of healthcare providers involved in the medication process. This study had some limitations. For example, study data were collected through the

self-report method, and hence, some participants might have avoided providing appropriate responses to the study instruments due to their fear of punishment and blame. To manage this limitation, study instruments were anonymous and participants were ensured of data confidentiality.

Conclusion

This study evaluated the medication safety climate in hospitals affiliated with the Isfahan University of Medical Sciences, Isfahan, Iran, from the healthcare providers' perspective. The mean of participants' positive responses showed that the overall score of medication safety climate was at a moderate level. The mean scores of feedback and communication about error and teamwork were at a good level. The high score of the mentioned dimensions provides the basis for improving the medication safety climate in healthcare facilities. Moreover, the mean scores of stress recognition, job satisfaction, safety climate, working condition, and organizational learning were moderate. To improve the medication safety climate, healthcare team members are required to work in a safe workplace and have sufficient job satisfaction. Job dissatisfaction causes stress and fatigue, resulting in errors. Health center managers and policymakers need to employ a proactive approach to prevent errors. Also, in order to learn from the error, medication errors must be reported, and root cause analysis (RCA) be performed.

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Conflicts of interest

There are no conflicts of interest.

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