

## Assessment of Patient Safety Culture in a Selected Number of Pharmacies Affiliated to Mashhad University of Medical Sciences Using the Pharmacy Survey on Patient Safety Culture (SOPS)

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ARTICLE INFO	ABSTRACT
<p><b>Article type:</b> Original Article</p> <hr/> <p><b>Article history:</b> Received: 10-Jan-2016 Accepted: 31-Jan-2016</p> <hr/> <p><b>Keywords:</b> Culture Patient safety Pharmacy</p>	<p><b>Introduction:</b> Patient safety culture plays a pivotal role in the improvement of patient safety level in health centers. This study aimed to assess patient safety culture in the pharmacies affiliated to Mashhad University of Medical Sciences, Iran using a standard questionnaire developed by the American Agency for Healthcare Research and Quality (AHRQ).</p> <p><b>Materials and Methods</b> This analytic, descriptive, cross-sectional study was conducted on 108 pharmacists and pharmacy technicians in Mashhad, Iran in 2015. Participants were selected via random cluster sampling. Data were collected using the Pharmacy Survey on Patient Safety Culture (SOPS). Data analysis was performed in SPSS Version 16 at the significance level of 0.05.</p> <p><b>Results:</b> Among various dimensions of patient safety culture, “communication openness” had the highest mean score (0.63±4.27) as obtained by the pharmacists, while pharmacy technicians had the highest mean score in the dimension of “teamwork” (0.58±4.18). Moreover, the lowest mean score was observed in the dimension of “overall perceptions of patient safety” in both sample groups.</p> <p><b>Conclusion:</b> According to the results of this study, commitment of healthcare authorities to patient safety culture is the most important factor in the promotion of organizational patient safety. Considering that the lowest score of patient safety culture belonged to the dimension of “overall perceptions of patient safety”, it is recommended that related training interventions be implemented for healthcare staff in order to establish and promote the patient safety culture in pharmacies.</p>

► **Please cite this paper as:**

Jamili S, Ebrahimipour H, Hooshmand E, Esmaily H, Vafaei Najar A. Assessment of Patient Safety Culture in a Selected Number of Pharmacies Affiliated to Mashhad University of Medical Sciences Using the Pharmacy Survey on Patient Safety Culture (SOPS). *Patient Saf Qual Improv.* 2016; 4(3): 388-393.

### Introduction

Patient safety is one of the main components of healthcare quality, which is defined as the avoidance, prevention and correction of the damages and adverse consequences associated with the process of care (1).

One of the contributing factors for the improvement of patient safety in health centers is compliance with the patient safety culture (2). Patient safety culture reflects the priority of patient safety in the performance of healthcare personnel in different departments and organizations and assesses the commitment of staff to

the organization (3). Adverse events and medical errors are among the major challenges in the health system of every country, and attempt of healthcare personnel to minimize these challenges and reduce the associated damages is of paramount importance (4).

Some of the imperative requirements for the promotion of patient safety culture in an organization include lack of error concealment and detection of incidents, training of employees in terms of patient safety principles, presence of fault reporting systems,

use of reporting system data to improve care processes, Environment free from blame to encourage employees, efficient team work, transparent relations between units and departments, cooperation of departments for the benefit of patients and attention of healthcare authorities to patient safety culture (5).

Currently, healthcare departments have started to raise the awareness of staff regarding the principles of patient safety; nevertheless, this phenomenon is not reported as extensively in pharmacies (6).

This is while medication errors are the most common risk factors for patient safety (7-9).

Statistics have suggested that 10-18% of healthcare damages in hospitals occur due to different types of medical errors (10, 11). Unlike hospitals, little information is available regarding the epidemiology and typology of these errors in pharmacies (12). Patient safety in pharmacies ascertains that patients receive the optimal therapeutic drugs in appropriate doses at the right time with the most suitable method. Meanwhile, it is crucial that patients be fully aware of the proper use of medications (13).

According to the literature, errors in reading prescriptions are the most important medication error in pharmacies, accounting for 65% of all errors. The second most common error factor in pharmacies is the events and errors in the process of medication distribution. Distribution involves obtaining a prescription copy from the patient, preparing the medications, setting the proper label and medication packing, which constitutes 15% of medication errors (14). According to statistics, error rate of medication distribution is approximately 3-6%. However, there is lack of information regarding the exact causes and circumstances of pharmacy errors (15). To date, few studies have investigated the frequency of medication errors and incidents in pharmacies (16-18).

In previous studies in this regard, patient safety culture in pharmacies has been evaluated using instruments with low accuracy and precision. In December 2012, the American Agency for Healthcare Research and Quality (AHRQ) designed a questionnaire to assess the patient safety culture in pharmacies. No studies have used this questionnaire to determine the status of patient safety culture in Mashhad city, as one of the major population centers of Iran. This study aimed to evaluate the patient safety culture in a number of selected pharmacies in Mashhad, Iran.

## Materials and Methods

This analytic, descriptive, cross-sectional study was conducted during June-August 2015 in Mashhad, Iran. Study population consisted of all the pharmacists and pharmacy technicians in Mashhad city. Given the lack of similar studies to extract necessary parameters and determine the sample size, a pilot study was conducted in 15 pharmacies selected from the sample population, and the sample variance was obtained at 6.82

Considering the confidence level of 95% and maximum acceptable error of  $d=0.75$ , and based on the research community (450 pharmacies in Mashhad city), sample size of this study was calculated at 43. After adding 25% non-response prediction, final sample size was determined at 54.

Cluster sampling was used for the random selection of 54 pharmacies from 13 districts of Mashhad Municipality.

In proportion to the number of pharmacies in each district, two questionnaires were completed in each pharmacy by the pharmacists and technicians. As such, sample size of the respondents increased to 108 subjects.

In this study, required data were collected using the Pharmacy Survey on Patient Safety Culture (SOPS), which was first developed by the AHRQ in 2012.

SOPS consists of 36 items to evaluate patient safety culture in 11 dimensions, including communication about mistakes (3 items), communication about prescriptions across shifts (3 items), communication openness (3 items), organizational learning and continuous improvement (3 items), overall perceptions of patient safety (3 items), patient counseling (3 items), physical space and environment (3 items), response to mistakes (4 items), staff training and skills (4 items), staffing, work pressure, and pace (4 items), and teamwork (3 items). These dimensions are scored based on a five-point Likert scale (strongly disagree: 1, strongly agree: 5).

Moreover, SOPS contains three items on the number of reported errors, three items about relevant background information of audience, and one question about the viewpoint of the respondents regarding the general rating of patient safety in the pharmacy. In addition, a comments section is available in this questionnaire.

Verbal consent was obtained from all the subjects prior to the study, and participants were assured of the confidentiality of their personal and professional information.

This article was extracted from another project, in the first phase of which the validity of SOPS was confirmed using confirmatory factor analysis to assess the status of the patient safety culture in pharmacies of Mashhad city (19).

Durability of this questionnaire was evaluated based on a study performed on 15 samples. Using the SPSS Version 16, durability of SOPS was confirmed by the separate analysis of each question. In this process, questions with Cronbach's alpha of less than 70% were edited and modified, and the Cronbach's alpha of the questionnaire was estimated at 88%.

Data analysis was performed in SPSS Version 16 in order to evaluate the attitude of participants toward the dimensions of patient safety culture, descriptive statistics (mean, standard deviation, frequency, and cumulative frequency) were used. Moreover, to determine the associations between the total score of

attitude toward patient safety, demographic variables, and dimensions of patient safety culture, we used T-test, one-way analysis of variance (ANOVA) and

Pearson's correlation-coefficient at the significance level of 0.05.

## Results

In total, 108 pharmacy personnel in Mashhad city contributed to this study, 60% of whom were pharmacists, and 55.5% had more than 40 working hours per week in pharmacies (Table 1).

**Table 1: Demographic data of research population**

Variable	Items	Number	Percentage	Variable	Items	Number	Percentage
Organizational Position	Pharmacist	56	60	Overall Rating	Poor	6	5.5
	Technician/Student	43	40		Moderate	9	8
	Pharmacy Cashier	9	8		Good	36	33.5
Current Experience in Pharmacy	<6 months	10	9.5	Working Hours per Week	Very Good	42	39
	6 months-1 year	22	20.5		Excellent	15	14
	1-3 years	26	24		1-16 hours	6	5.5
	3-6 years	18	17		17-31 hours	14	13
	6-12 years	16	14.5		32-40 hours	28	26
	>12 years	16	14.5		>40 hours	60	55.5

Results of ANOVA were indicative of a significant difference in the total score of the dimensions of patient safety culture in the pharmacies of 13 districts of Mashhad Municipality ( $P=0.04$ ). However, survey of the viewpoints of the respondents toward the total score of patient safety culture indicated that these individuals considered the patient safety culture to be at a higher level. On the other hand, participants employed in the pharmacies of district five of Mashhad Municipality assessed the patient safety culture in their workplace to be lower than other pharmacies (Table 2).

**Table 2: Total mean score of patient safety culture based on different districts of Mashhad Municipality**

Areas	Number of Pharmacies	Mean Score of Patient Safety Culture	Standard Deviation
District 6	4	4.33	0.20
District 11	12	4.26	0.27
District 7	2	4.11	0.47
District 1	24	4.10	0.36
District 2	14	4.09	0.31
District 13	6	4.09	0.20
District 9	6	4.04	0.87
District 12	2	4.00	0.36
District 4	8	3.99	0.57
District 3	4	3.86	0.50
District 10	8	3.77	0.33
District 8	14	3.66	0.53
District 5	4	3.66	0.35

Among the dimensions of patient safety culture, "communication openness" had the highest score (mean:  $0.63\pm 4.27$ ) as obtained by the pharmacists, while pharmacy technicians achieved the highest score in the dimension of "teamwork" (mean:  $0.58\pm 4.18$ ). On the other hand, the lowest score was observed in the dimension of "overall perceptions of patient safety" in both sample groups (Table 3).

**Table 3: Mean score of dimensions of patient safety culture based on organizational positions**

Dimensions of Patient Safety Culture	Pharmacist n=56	Pharmacy Technician/Student n=43	Pharmacy Cashier n=9
Patient Counseling	4.26±0.55	4.12±0.78	4.22±0.44
Communication Openness	4.27±0.63	4.10±0.36	4.18±0.58
Overall Perceptions of Patient Safety	3.48±0.40	3.44±0.36	3.15±0.37
Organizational Learning-Continuous Improvement	4.23±0.51	4.16±0.64	4.18±0.50
Teamwork	4.11±0.67	4.17±0.58	4.33±0.37
Communication About Prescriptions Across Shifts	4.27±0.62	4.14±0.77	3.29±0.52
Communication About Mistakes	4.11±0.72	3.86±0.95	3.85±0.60
Response to Mistakes	3.96±0.64	3.81±0.54	3.86±0.28
Staff Training and Skills	4.15±0.61	4.15±0.61	4.41±0.27
Physical Space and Environment	3.85±0.85	4.01±0.70	4.03±0.63
Staffing, Work Pressure, and Pace	3.66±0.66	3.56±0.99	3.99±0.29

According to the results of ANOVA, there was a statistically significant difference between the organizational position of personnel and level of patient safety culture (P=0.02). In addition, a significant difference was observed between the total scores of the dimensions of patient safety culture and working hours of participants per week (P=0.005).

Results of Pearson’s correlation-coefficient were indicative of a positive correlation between the total score of patient safety culture and work experience in pharmacies (P=0.02) (r=0.21). Moreover, a significant association was observed between all the dimensions of patient safety culture and total score of patient safety culture (P<0.05). Therefore, it could be concluded that all the aspects of patient safety culture are effective in the promotion of this culture among healthcare employees (Table 4).

**Table4: Correlations between dimension scores and total score of patient safety culture**

Dimensions of Patient Safety Culture	Correlation-coefficient	Patient Counseling	Communication Openness	Overall Perceptions of Patient Safety	Organizational Learning-Continuous Improvement	Teamwork	Communication About Prescriptions Across Shifts	Communication About Mistakes	Response to Mistakes	Staff Training and Skills	Physical Space and Environment	Staffing, Work Pressure, and Pace
Pearson’s correlation-coefficient	Total Score of Patient Safety Culture	0.67	0.74	0.25	0.52	0.59	0.69	0.83	0.61	0.66	0.62	0.68
P-value		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

**Discussion**

This was an analytical, cross-sectional study conducted to evaluate the status of patient safety culture in the pharmacies of Mashhad city, Iran. Among the 11 dimensions of patient safety culture, “communication openness” had the highest score among pharmacists, while pharmacy technicians achieved the highest score in the dimension of “teamwork”. Moreover, both study groups recognized the “overall perceptions of patient safety” as the weakest dimension of patient safety culture in pharmacies. This finding is inconsistent with the results of the pilot study performed by the AHRQ.

In the mentioned research, pharmacists obtained the highest score of patient safety culture in the dimension of “organizational learning-continuous improvement”, while the other healthcare staff achieved the highest score in the dimension of “patient counseling”. On the other hand, the lowest scores in both sample groups were reported in the dimension of “staffing, work pressure, and pace” (13).

The high score of “communication openness” dimension as obtained by the pharmacists in the present study could be due to the fact that most pharmacists are responsible for the management of the pharmacy and focus on providing an independent environment, where employees are able to communicate easily and express their problems and opinions despite possible differences in viewpoints with the pharmacists.

In the current research, high score of the teamwork dimension as achieved by pharmacy technicians could be attributed to the confinement of the environment in pharmacies and limited number of personnel, which contribute to the fostering of close relationships between staff and enhancing the morale of teamwork.

On the other hand, low scores of the dimension of “overall perceptions of patient safety” could be attributed to the inadequate knowledge of pharmacy staff regarding the issues associated with patient safety culture. This has caused the personnel to solely focus on selling medications to the clients, as the majority of our participants responded negatively to one of the questionnaire statements in this regard (In this pharmacy, emphasis is placed on patient safety rather than selling medications).

Comparison of the dimensions of patient safety culture between the present research and the aforementioned pilot study in the U.S.A indicated that the scores reported in the pilot study were higher than our research, with the exception of the dimensions of “organizational learning-continuous improvement”, “teamwork”, “staff training and skills”, and “staffing, work pressure, and pace” (13).

According to the results of the current study, total score of patient safety culture in the pharmacies of different districts of Mashhad Municipality had a significant difference.

This could be due to the variations in the characteristics of the people living in these regions. As such, if the population increases, the work content and pressure can increase the incidence of errors.

Perhaps this is one of the most important causes of the lower total scores of patient safety culture in pharmacies located in densely inhabited areas.

Other findings of the present study were indicative of a significant difference in the overall rating of patient safety between pharmacists and other pharmacy staff.



In explanation, pharmacists are mostly in the management position of pharmacies and consider their pharmacies to comply with the principles of patient safety culture at a higher level than other pharmacies.

Results of the current research in this regard are inconsistent with the findings of the pilot study by the AHRQ in the U.S.A.

In the mentioned study, the majority of pharmacy staff assessed the level of patient safety to be excellent, and 53% of pharmacists considered the degree of compliance with this culture to be satisfying as well (13). Findings of the present study were indicative of a significant association between the working hours of pharmacy staff and total score of patient safety culture.

As such, obtained scores of patient safety culture principles were found to be directly influenced by the length of presence at the pharmacy, and staff with dissimilar working hours scored differently in the dimensions of patient safety culture in the pharmacy. According to the results of the Pearson's correlation-coefficient in the present study, there is a positive linear correlation between the work experience in pharmacy and total score of patient safety culture. Correspondingly, higher experience level of pharmacy staff is associated with a higher rating of the patient safety culture.

Considering that more than 54% of the studied pharmacy staff in the current study had work experience of less than three years, implementation of training interventions focusing on patient safety issues for the personnel seems crucial.

Furthermore, establishment of the patient safety culture in pharmacies requires access to safe and error-free environments. Main limitations of the present study were the lack of cooperation of some pharmacy officials and staff in completing the questionnaire, immense distribution of pharmacies in Mashhad city, and insufficient access to the pharmacies located in Border city border.

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## Conclusion

According to the results of this study, the most important factor in creating a secure healthcare organization is the commitment of authorities to the culture of patient safety in different clinical environments. Assessment of patient safety culture has multiple effects on the function and efficiency of pharmacies. For instance, it raises the awareness about the status of patient safety in pharmacies, while increasing the knowledge of personnel regarding the strengths and weaknesses of patient safety culture in their workplace. Furthermore, it enables pharmacy officials to find practical solutions to reduce medication errors and improve patient safety through the recognition of these factors. One of the essential components of patient safety culture is providing a blame-free environment in healthcare organizations in order to report incidents and errors accurately. Considering the low scores of the dimension of "overall perceptions of patient safety" in this study, **implementation of training interventions** focused on patient safety culture could remarkably enhance this healthcare priority in pharmacies. Proper establishment of patient safety culture is time-consuming and requires the development and adjustment of the values, beliefs and behaviors of healthcare personnel with the principles of patient safety culture.

## Acknowledgement

This article was extracted from a research project approved by the Research Council of Mashhad University of Medical Sciences, entitled the "Assessment of patient safety culture in a selected number of pharmacies affiliated to Mashhad University of Medical Sciences using the SOPS standard questionnaire" (code: 920626). Hereby, we extend our gratitude to all the pharmacists and pharmacy technicians for their participation in this study.

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