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Assessment of Patient Safety Culture in Community Pharmacies Using the Pharmacy Survey on Patient Safety Culture (Pharmacy SOPS)

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Research Article

Keywords: Patient safety culture, Community pharmacy, Medication errors, Pharmacy SOPS, Cross-sectional study

Posted Date: June 29th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9882141/v1

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Additional Declarations: No competing interests reported.

Abstract

Background: Patient safety culture is an important indicator of healthcare quality, yet little is known about it in Afghan community pharmacies. This study aimed to assess patient safety culture among pharmacy staff in Herat province, Afghanistan.

Methods: A descriptive-analytical cross-sectional study was conducted in 2025 among 350 pharmacy staff selected through stratified random sampling from community pharmacies in five geographic areas of Herat. Data were collected using the Persian version of the AHRQ Pharmacy Survey on Patient Safety Culture (Pharmacy SOPS). The questionnaire was localized and its content validity and reliability were confirmed before use. Data were analyzed in SPSS version 16 using descriptive statistics, t-test, ANOVA, and multiple linear regression.

Results: The overall mean patient safety culture score was 3.81 ± 0.86 out of 5, and 50.3% of participants rated it as very high. Among the dimensions, patient counseling had the highest score (4.4 ± 0.8), while staffing, work pressure, and pace had the lowest score (3.7 ± 0.6). In multivariate analysis, age and work experience were significant predictors of patient safety culture. The regression model explained 32% of the total variance. The reliability of the questionnaire was acceptable, with a Cronbach's alpha of 0.84.

Discussion and Conclusion: Community pharmacies in Herat showed strengths in counseling and teamwork, but staffing and workload remained important concerns. These findings suggest the need for better workforce planning, workflow improvement, and a non-punitive environment for reporting errors.

Highlights

• First systematic assessment of pharmacy patient safety culture in Afghanistan

• patient counseling and Teamwork showed the strongest safety culture scores

• Staffing, Work Pressure, and Pace were the weakest safety dimensions

• Work experience positively predicted patient safety culture

• Strengthening just culture and staffing policies may improve safety

Introduction

Patient safety is widely recognized as a fundamental cornerstone of high-quality healthcare delivery worldwide. Nevertheless, international evidence indicates that patient safety incidents, particularly in low- and middle-income settings, impose a substantial burden on healthcare systems.(1, 2) Patient safety, defined as "the freedom from accidental injuries during the course of medical care; activities to avoid, prevent, or correct adverse outcomes which may result from the delivery of healthcare (3)" is a critical element of healthcare quality and has been a public concern across all healthcare systems worldwide(4). Medication errors, defined as "any preventable events that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient, or consumer" (5), are a common component of medical errors threatening patient safety.(5, 6) The World Health Organization (WHO) estimates that the global cost of medication errors reaches up to USD 42 billion annually, imposing not only serious clinical consequences but also a significant economic burden on health systems.(7, 8)

In response to this global challenge, the prevailing paradigm in patient safety has shifted from an individual blame-oriented approach toward a systems-based and culture-focused perspective.(9) Within this framework, *patient safety culture* has emerged as a key determinant of safe care. Patient safety culture can be defined as the shared pattern of

values, attitudes, beliefs, and behaviors within an organization that prioritizes safety and continuously seeks to minimize harm associated with healthcare processes.(10) Effective institutionalization of safety requires an environment in which transparent error reporting without fear of blame is encouraged, learning from incidents is emphasized, teamwork is strengthened, and organizational leadership actively supports safety initiatives.(11, 12)

Among healthcare delivery settings, community pharmacies play a unique and critical role. They often serve as the most accessible point of contact between patients and the healthcare system and represent the final line of defense in the medication use process.(13) Through accurate dispensing, patient counseling, and monitoring for drug–drug interactions, pharmacists make an indispensable contribution to medication therapy management and error prevention.(14, 15) However, the high-pressure and high-volume nature of work in community pharmacies—characterized by large prescription volumes, frequent interruptions, and staffing constraints—creates an environment that is particularly prone to medication errors and near-miss events.(16) A study conducted by the Agency for Healthcare Research and Quality (AHRQ) specifically highlighted the importance of organizational factors influencing safety in pharmacy settings and underscored the need for standardized tools to assess these environments.(12)

To systematically evaluate these challenges, AHRQ developed the *Pharmacy Survey on Patient Safety Culture* (Pharmacy SOPS). This validated instrument measures key dimensions of safety culture, including teamwork, supervisor and management expectations and actions, organizational learning, communication and response to mistakes, as well as critical operational factors such as work pressure, workload, and prescription processing .(12) International application of this tool has provided valuable insights into strengths and weaknesses of patient safety culture in community pharmacies. For example, a systematic review published in 2020 emphasized the crucial role of a strong safety culture in reducing medication errors in primary care settings and demonstrated how organizational factors influence patient safety outcomes.(5)

Evidence from the Middle East and other developing regions reveals concerning and consistent patterns. Studies conducted in various regional settings have consistently identified work pressure and workload as the weakest dimensions of patient safety culture in community pharmacies.(4, 17–19) Supporting these findings, a qualitative study further demonstrated that contextual factors such as staffing shortages and excessive workload directly compromise service quality and increase the risk of medication errors.(20) This convergence of evidence highlights the urgent need for targeted interventions addressing structural and organizational determinants of safety.

Despite the growing body of evidence from neighboring contexts, there remains a substantial research gap regarding patient safety culture in community pharmacies within Afghanistan. To date, no published study has systematically assessed this issue using the standardized Pharmacy SOPS instrument. This lack of evidence hinders accurate understanding of existing challenges, limits the development of evidence-based policies, and constrains the implementation of effective improvement strategies in a resource-limited healthcare system facing unique contextual challenges.

Therefore, the present study aims to address this critical gap by conducting, for the first time, a comprehensive assessment of patient safety culture in community pharmacies using the Pharmacy SOPS. The findings will not only describe the current state of safety culture but also identify key areas requiring improvement. This evidence is expected to provide a robust scientific basis for policymakers and healthcare managers to design and implement targeted interventions—such as workload reduction strategies, team-based training, and strengthened error-reporting systems—to enhance patient safety and the quality of pharmaceutical care.

Methods

Study design and setting

This descriptive–analytical cross-sectional study was conducted in 2025 among staff working in community pharmacies across Herat province, Afghanistan. The study targeted personnel involved in routine pharmacy services, including pharmacists, pharmacy technicians, and other pharmacy staff.

Study population

The source population comprised staff working in approximately 870 community pharmacies in Herat province, with an estimated total workforce of about 5,400 individuals.Inclusion and exclusion criteria

Eligibility criteria

Participants were eligible if they:

Had at least six months of continuous work experience in pharmaceutical services (to ensure sufficient familiarity with pharmacy workflow and routine processes); and Provided informed consent and were willing to participate.

Questionnaires with more than 50% missing responses were excluded from analysis.

Sample size and sampling strategy

A stratified random sampling technique was employed to ensure geographical representation across Herat province. The study population comprised approximately 5,400 pharmacy staff working in 870 community pharmacies. These pharmacies were divided into five geographical strata: North, South, East, West, and Central.

The required sample size was calculated using Cochran's formula for finite populations. With a 95% confidence level ($Z = 1.96$), a 5% margin of error ($d = 0.05$), and a population size of 5,400, the minimum sample size was determined to be 365 participants. To account for potential non-responses or incomplete questionnaires, 377 surveys were distributed.

Within each geographical stratum, pharmacies were selected randomly in proportion to the total number of pharmacies in that area. Once a pharmacy was selected, a census approach was applied internally, where all eligible staff members—including pharmacists, technicians, and pharmacy students with at least six months of continuous work experience—were invited to participate

Study tool

The Pharmacy Survey on Patient Safety Culture (PSOPSC), developed by the Agency for Healthcare Research and Quality (AHRQ); community pharmacy version, was used to collect data for the study [20] (Additional file 1).

The survey instrument was the AHRQ Pharmacy Survey on Patient Safety Culture (Pharmacy SOPS), which is organized into five sections (Sections A–E) and includes 36 items designed to measure 11 dimensions of organizational patient safety culture. These dimensions comprise six composites measured by perceptions and five composites measured by practices. The survey uses 5-point agreement scales ranging from "strongly disagree" to "strongly agree," as well as frequency scales ranging from "never" to "always." In addition, the survey includes one overall item asking participants to rate their pharmacy's patient safety on a 5-point scale from "poor" to "excellent."

Validity and reliability

Localization, validity, and reliability

Prior to field implementation, the Persian version of the PSOPSC, underwent a localization process by the study team, including a native Afghan researcher, to ensure that the terms and phrases were consistent with common communication in local Afghan pharmacies.

Validity. Face and content validity were assessed by a panel of 20 experts in health management and pharmacy practice. Content validity was examined using the Content Validity Ratio (CVR) and the Content Validity Index (CVI). All items achieved acceptable CVI values (> 0.79), supporting content adequacy for local use.

Reliability. Internal consistency was assessed using Cronbach's alpha. In addition, a test–retest procedure was conducted with 30 pharmacy staff over a 10-day interval. Cronbach's alpha coefficients for the overall instrument and all extracted dimensions were > 0.70, indicating satisfactory reliability (dimension-specific coefficients are reported in the Results section).

Data collection procedure

Data were collected through on-site visits to selected pharmacies after prior coordination with pharmacy management. Questionnaires were self-administered to eligible staff. A trained researcher remained available to clarify questions when needed, while emphasizing anonymity, voluntary participation, and confidentiality to minimize response bias.

Data Analysis and Scoring

The analysis was conducted in strict accordance with the AHRQ Pharmacy Survey on Patient Safety Culture (PSOPSC) user guide. Although the questionnaire was distributed in five distinct operational sections (Sections A to E) to maintain clarity and respondent engagement, the item classification and scoring were aligned with the standardized 11-dimension composite framework defined by the AHRQ.

To ensure consistency in measurement, items negatively worded within the survey—specifically those identified in the AHRQ protocol as potentially skewing toward negative safety perceptions—were reverse-coded. This ensured that, across all 11 dimensions, higher scores consistently reflected a more positive patient safety culture.

The composite score for each of the 11 dimensions was calculated by averaging the response values of the corresponding items within that dimension. Following the AHRQ guidelines, we computed the "Percent Positive Response" for each dimension, defining a positive response as the selection of "Strongly Agree/Agree" or "Always/Most of the time." The overall patient safety culture score was derived from the grand mean of all items, providing a unified index ranging from 1 to 5. All analyses were performed using SPSS version 16.0, ensuring a robust statistical interpretation of the safety culture status within the studied community pharmacies.[20].

Results

1. Psychometric Properties

The Persian version of the PSOPSC was validated for use in the local context. Content validity was assessed by a panel of 20 experts, and all items achieved a CVI greater than 0.79. Because the questionnaire includes five main sections, internal consistency and reliability were assessed separately for each section during the localization process. Cronbach's alpha was above 0.70 for all sections, and the overall scale reliability was 0.84. Table 1 provides a detailed breakdown of these psychometric estimates.

Table 1
Validity and reliability estimates (CVI, S-CVI, and Cronbach's alpha) for the PSOPSC sections

Section	Description (AHRQ Framework)	Number of Items	Included Dimensions	CVI	S-CVI			
					Relevance	Clarity	Simplicity	Cronbach's Alpha
A	Working in This Pharmacy	10	Physical Space and Environment /Teamwork /Staff Training and Skills	0.80	0.89	0.84	0.80	0.75
B	Communication and Work Pace	16	Communication Openness /Patient Counseling /Staffing, Work Pressure, and Pace /Communication About Prescriptions Across Shifts /Communication About Mistakes	0.82	0.88	0.85	0.83	0.86
C	Patient Safety and Response to Mistakes	10	Response to Mistakes /Organizational Learning—Continuous Improvement/ Overall Perceptions of Patient Safety	0.79	0.89	0.86	0.78	0.83
D	Documenting Mistakes	3	Documenting Mistakes	0.95	0.90	0.87	0.82	0.73
E	Overall Rating	1	Overall Rating on Patient Safety	0.81	0.89	0.85	0.80	0.84

2. Participant Characteristics

A total of 377 questionnaires were distributed, yielding 350 valid responses (92.8% response rate). The mean age of participants was 38.4 ± 7.2 years, and 57% were female. Most participants held a Master's degree (40.6%) and were pharmacists (35.3%) or pharmacy students (26.8%). Complete demographic details are provided in Table 2.

Table 2
Demographic Characteristics of the Respondents

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	152	43%
	Female	198	57%
Age (years)	20–30	42	12%
	30–40	154	44%
	40–50	142	41%
	>=50	12	3%
Education Level	Below Diploma	21	6%
	Diploma/Associate Degree	37	11%
	Bachelor's Degree	107	31%
	Master's Degree	144	41%
	PhD	41	12%
Job Position	Pharmacist	121	35%
	Pharmacy Technician	61	17%
	Staff	65	19%
	Student	103	29%
Work Experience	< 6 months	71	20%
	6 months – 1 year	72	21%
	1–3 years	46	13%
	3–6 years	61	17%
	6–12 years	69	20%
	> 12 years	31	9%
Weekly Work Hours	1–16 hours	165	47%
	17–31 hours	37	11%
	32–40 hours	78	22%
	> 40 hours	70	20%

3. Patient Safety Culture Status

The overall mean score for patient safety culture was 3.81 ± 0.86 (out of 5). The mean score was converted to a 0–100 scale, and 50.3% of respondents rated their pharmacy's patient safety as "very high" (score ≥ 80 out of 100), while only 4% gave a "low" rating (score < 40) (Table 3).

Table 3
overall mean score of patient safety culture

Level of Patient Safety Culture	Frequency (n)	Percentage (%)
Very Low	0	0
Low	14	4
Moderate	48	13.7
High	112	32
Very High	176	50.3
Total	350	100

Among the 11 dimensions, “Patient Counseling” (mean 4.4 ± 0.8) was identified as the strongest area of practice, whereas “Staffing, Work Pressure, and Pace” (mean 3.7 ± 0.6) was the weakest **(**Table 4**).**

Table 4
Mean score of dimensions of patient safety culture

Dimension (Composite)	No. of Items	Mean (SD) [1–5]	Mean Score [0-100]	Percent Positive Response (%)
Patient Counseling	3	4.4 (0.8)	88	82.0%
Teamwork	3	4.3 (0.8)	86	76.8%
Communication About Mistakes	3	4.3 (0.7)	86	74.5%
Communication Openness	3	4.2 (0.9)	84	71.2%
Communication Across Shifts	3	4.2 (0.9)	84	70.5%
Documenting Mistakes	3	4.1 (0.6)	82	66.0%
Response to Mistakes	4	4.1 (0.9)	82	64.8%
Physical Space and Environment	3	4.0 (0.5)	80	61.2%
Organizational Learning	3	3.9 (0.7)	78	56.4%
Staff Training and Skills	4	3.9 (0.7)	78	55.0%
Overall Perceptions of Safety	3	3.8 (0.5)	76	52.5%
Staffing, Work Pressure, and Pace	4	3.7 (0.6)	74	48.2%

4. Inferential Analysis and Predictors

The association between demographic characteristics and patient safety culture was examined using bivariate and multivariate analyses. IIn the bivariate analysis, age (p = 0.012), work experience (p = 0.008), gender (p = 0.004), and educational level (p = 0.001) were significantly associated with the overall safety culture score.To further identify independent predictors and control for potential confounding variables, a multiple linear regression analysis was conducted (Table 5). The model was statistically significant ($F_{(5,344)} = 13.06, p < 0.001$) and explained 32% of the total variance in safety culture scores (Adjusted $R^2 = 0.320$). In the multivariate model, when all variables were entered simultaneously, age ($\beta = 0.33, p = 0.003$) and work experience ($\beta = 0.21, p = 0.033$) remained significant independent predictors of safety culture. Specifically, for every one-unit increase in the age category, the safety culture

score increased by 0.37 units, holding other variables constant. Although gender and education were significant in the bivariate analysis, they were not significant in the final regression model.

Table 5
Multiple Linear Regression Analysis of Demographic Predictors

Variable	B	Std. Error	95% CI (Lower - Upper)	Standardized Beta	t-value	p-value	VIF
(Constant)	2.45	0.35	[1.76, 3.14]		7	< 0.001	
Age	0.37	0.11	[0.15, 0.59]	0.33	3.37	0.003*	1.37
Work Experience	0.18	0.08	[0.02, 0.34]	0.21	2.25	0.026*	1.34
Gender	0.37	0.2	[-0.02, 0.76]	0.18	1.85	0.065	1.37
Education	-0.19	0.16	[-0.50, 0.12]	-0.11	-1.18	0.238	1.39
Weekly Hours	-0.14	0.1	[-0.34, 0.06]	-0.13	-1.4	0.163	1.41

Note: Dependent Variable: Overall Patient Safety Culture Score. $R^2 = 0.34$; Adjusted $R^2 = 0.320$

Discussion

To our knowledge, this is the first systematic assessment of patient safety culture in community pharmacies in Herat, Afghanistan, using the AHRQ Pharmacy SOPS tool. The findings highlight strengths and weaknesses in this area. Teamwork and patient consultation were the strongest dimensions. This pattern is a consistent finding among studies conducted exclusively in community pharmacies using the SOPS questionnaire:

In the Qatar-2021 study (5) and Saudi Arabia-2023 (21), the dimensions “patient consultation” and “teamwork” consistently had the highest percentage positive response (PPR) and were identified as key strengths of safety culture in pharmacies.

In the Lebanon-2023 study(22) (18), “teamwork” and “patient consultation” were also ranked among the highest dimensions.

The relatively high scores for teamwork and patient consultation may reflect the realities of pharmacy performance in this context. Where digital systems and formal clinical infrastructure are limited, face-to-face interaction and academic collaboration are likely to play a greater role in maintaining safety. This is not surprising given the evidence that through patient counseling, pharmacists can identify and resolve drug-related problems, recover from errors, and optimize patient quality of care.(23–26) There are numerous patient counseling guidelines that have been published by professional organizations,(27–29) and patient counseling skills are taught in schools of pharmacy,(30, 31) emphasizing that it is a key responsibility of pharmacists.

Our findings showed that the weakest dimension of patient safety from the participants’ perspective was “Staffing, Work Pressure, and Pace,” This suggests pharmacists feel that the workload and pace are not commensurate with the staffing levels of pharmacies.(32) which is fully consistent with findings from studies from Qatar (5), Saudi Arabia (21), and Lebanon (18, 22), Ethiopia(33), Cairo(34) and Malaysia(35). all of which identified this dimension as the most critical area for improvement. This finding is particularly concerning because inadequate staff can severely limit pharmacists’ ability to safely dispense prescriptions thus increasing risk of patient harm.(32)

This challenge is not limited to developing health systems; even the seminal work of the AHRQ in the United States highlighted “staffing and workload” as a problem area.(12) This global consensus strongly suggests that high prescription volumes, inadequate staffing levels, frequent interruptions, and time pressure are the most important systemic risk factors for medication errors and a weakened safety culture (8, 16). When pharmacy staff are overworked or work under time pressure, the risk of errors increases and there is less opportunity for review, consultation, and reflection.

Multivariate analysis adds another important layer to the findings. Age and work experience remain the strongest independent predictors of patient safety culture. Age was found to be a significant factor affecting eight patient safety culture composites, while years of experience significantly affected two composites. The findings suggest that patient safety culture improves as pharmacists age, which may explain the significant association between years of experience and some patient safety composites. This suggests that longer experience not only enhances technical skills, but also makes staff more aware of safety processes, the consequences of errors, and the need to report, and helps to institutionalize an internal safety culture.This is consistent with previous studies that also have discussed the influence of age on patient safety culture.(19, 36–39) Moreover, a study in Qatar showed that respondents with six or more years of practice experience in significantly responded more positively to survey items, these findings may be related to the fact that greater work experience grants pharmacy personnel the ability to effectively manage patient safety-related issues, as well as adapt to the immense workload adequately, than those with less experience.(40)

Overall, the findings indicate that safety culture in community pharmacies in Herat is strengthened by professional commitment and teamwork, but limited by staffing shortages and workload pressure. Improving safety in this setting is therefore likely to require system-level changes, not just individual effort. Measures such as redesigning workflow, distributing tasks more effectively, reducing unnecessary interruptions, and improving staffing arrangements may help ease pressure on pharmacy staff. Strengthening error-reporting systems and promoting a non-punitive response to mistakes may also encourage learning and contribute to safer practice.

A further implication is the need to protect the quality of patient counseling. If staff are burdened by workload or clerical tasks, counseling may become rushed or superficial, which would weaken one of the study’s main strengths. Any effort to improve safety culture should therefore preserve adequate time for direct pharmacist–patient communication.

Overall, patient safety culture in Herat community pharmacies appears to be supported by teamwork and professional commitment, but these strengths are limited by insufficient staffing and operational pressure. Addressing these system-level constraints will be important if pharmacies are to maintain and improve safe, high-quality care.

Conclusion

This study underscores that the foundation of patient safety in Herat’s community pharmacies is built on strong professional commitment and teamwork. However, these strengths are undermined by systemic challenges, primarily inadequate staffing and high work pressure. To elevate the safety culture from an individual-based model to a system-wide standard, pharmacy managers and health authorities in Afghanistan should prioritize workflow redesign and the implementation of non-punitive error-reporting systems. Future interventions should focus on optimizing the work pace to ensure that the current high quality of patient counseling is not compromised by burnout or clerical fatigue.

Strengths and Limitations

This study provides the first baseline for patient safety culture in Afghan community pharmacies, filling a significant gap in the country’s healthcare literature. A major strength is the high response rate (92.8%), which ensures that the findings are representative of the Herat province and minimizes the risk of bias. Additionally, using the standardized AHRQ tool allows for direct comparisons with international safety benchmarks.

However, the cross-sectional design means we cannot establish long-term trends or causal relationships. As with any self-reported survey, there is a risk that participants provided socially desirable answers rather than reflecting the daily reality. Lastly, since the study was limited to Herat, the findings should be generalized to other regions of Afghanistan with caution, considering the potential differences in regional healthcare infrastructure.

Declarations

Acknowledgements

We direct our thanks to the pharmacists who agreed to participate in the current study.

Authors' contributions

SJ: conception and design of the study and drafting the article. / HE: conception and design of the study /SE: collection of data and field work. All authors (SJ, SE, FK and HE) participated equally in the analysis and interpretation of data in addition to writing the manuscript. The authors have read and approved the final manuscript.

Funding

This work did not receive any This research is an excerpt from a research project approved with code 4012027 at Mashhad University of Medical Sciences, which was sponsored by this university

Availability of data and materials

The data set produced during the current study is available on reasonable request.

Ethics approval and consent to participate

This study was conducted in accordance with the ethical principles governing research involving human participants. Ethical approval was obtained from the Ethics Committee of Mashhad University of Medical Sciences, under approval code IR.MUMS.FHMPM.REC.1404.086. All ethical requirements, including obtaining written informed consent from participants, ensuring the confidentiality of responses, and guaranteeing the voluntary nature of participation, were fully observed.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

References

1. Organization WH. Global patient safety action plan 2021-2030: towards eliminating avoidable harm in health care: World Health Organization; 2021.
2. Jha AK, Larizgoitia I, Audera-Lopez C, Prasopa-Plaizier N, Waters H, Bates DW. The global burden of unsafe medical care: analytic modelling of observational studies. BMJ quality & safety. 2013;22(10):809-15.
3. Donaldson MS, Corrigan JM, Kohn LT. To err is human: building a safer health system. 2000.
4. Alsaleh FM, Abahussain EA, Altabaa HH, Al-Bazzaz MF, Almandil NB. Assessment of patient safety culture: a nationwide survey of community pharmacists in Kuwait. BMC health services research. 2018;18(1):884.

5. Assiri GA, Shebl NA, Mahmoud MA, Aloudah N, Grant E, Aljadhey H, et al. What is the epidemiology of medication errors, error-related adverse events and risk factors for errors in adults managed in community care contexts? A systematic review of the international literature. BMJ open. 2018;8(5):e019101.
6. Bond C, Raehl CL, Franke T. Clinical pharmacy services, hospital pharmacy staffing, and medication errors in United States hospitals. Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy. 2002;22(2):134-47.
7. Organization WH. Medication without harm. World Health Organization; 2017.
8. Aitken M, Gorokhovich L. Advancing the responsible use of medicines: applying levers for change. Available at SSRN 2222541. 2012.
9. Leape LL. The preventability of medical injury. Human error in medicine: CRC Press; 2018. p. 13-25.
10. Sammer CE, Lykens K, Singh KP, Mains DA, Lackan NA. What is patient safety culture? A review of the literature. Journal of nursing scholarship. 2010;42(2):156-65.
11. Singer SJ, Vogus TJ. Reducing hospital errors: interventions that build safety culture. Annual review of public health. 2013;34(1):373-96.
12. Sorra J, Zebrak K, Yount N, Famolaro T. Advancing the Measurement of Patient Safety Culture: Development and Psychometrics of the AHRQ SOPS Hospital Survey Version 2.0. 2025.
13. Beso A, Franklin BD, Barber N. The frequency and potential causes of dispensing errors in a hospital pharmacy. Pharmacy World and Science. 2005;27(3):182-90.
14. Chui MA, Stone JA. Exploring information chaos in community pharmacy handoffs. Research in Social and Administrative Pharmacy. 2014;10(1):195-203.
15. Henriksen K, Battles JB, Keyes MA, Grady ML. Advances in patient safety: new directions and alternative approaches. AHRQ Publication. 2008(08-0034).
16. Ashcroft DM, Quinlan P, Blenkinsopp A. Prospective study of the incidence, nature and causes of dispensing errors in community pharmacies. Pharmacoepidemiology and drug safety. 2005;14(5):327-32.
17. Al-Tehewy M, Mohamed S, Ammar N. Patient safety culture among community pharmacists in Cairo. Journal of the Egyptian Public Health Association. 2023;98(1):10.
18. El-Jardali F, Jaafar M, Dimassi H, Jamal D, Hamdan R. The current state of patient safety culture in Lebanese hospitals: a study at baseline. International Journal for Quality in Health Care. 2010;22(5):386-95.
19. Jamili S, Ebrahimipour H, Hooshmand E, Esmaeli H, Vafaee 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). Journal of Patient Safety & Quality Improvement. 2016;4(3):388-93.
20. Esmalipour R, Larijani B, Mehrdad N, Ebadi A, Salari P. The ethical challenges in pharmacy practice in community Pharmacies: A qualitative study. Saudi Pharmaceutical Journal. 2021;29(12):1441-8.
21. Easwaran V, Almeleebia T, Mantargi M, Khan N, Alshahrani S, Orayj K, et al. Patient Safety Culture in the Southern Region of Saudi Arabia: A Survey among Community Pharmacies. Healthcare 2023, 11, 1416. 2023.
22. Radwan L, Salameh P. Evaluation of patient safety culture in community pharmacies. Explor Res Clin Soc Pharm. 2023;10:100260.
23. Wu JY, Leung WY, Chang S, Lee B, Zee B, Tong PC, et al. Effectiveness of telephone counselling by a pharmacist in reducing mortality in patients receiving polypharmacy: randomised controlled trial. Bmj. 2006;333(7567):522.
24. Rantucci MJ. Pharmacists talking with patients: a guide to patient counseling: Lippincott Williams & Wilkins; 2007.
25. Chandra A, Malcolm N, Fetters M. Practicing health promotion through pharmacy counseling activities. Health Promotion Practice. 2003;4(1):64-71.
26. Ebid A-HI, Abdel-Wahab E. Bronchial asthma and COPD: impact of pharmaceutical care on outcomes and quality of life in Egyptian patients. Bulletin of Pharmaceutical Sciences Assiut University. 2006;29(1):167-85.

27. USP. USP medication counselling behavior guidelines. 1992. www.ipsf.org. Accessed September 4, 2014.
28. ASCP. American Society of Consultant Pharmacists. Guidelines for pharmacist counseling of geriatric patients. 1998. www.ascp.com. Accessed September 11, 2014. [
29. ASHP guidelines on pharmacist-conducted patient education and counseling. Am J Health Syst Pharm. 1997;54(4):431-4.
30. Liekens S, Vandael E, Roter D, Larson S, Smits T, Laekeman G, et al. Impact of training on pharmacists' counseling of patients starting antidepressant therapy. Patient Education and Counseling. 2014;94(1):110-5.
31. Santos AP, Mesquita AR, Oliveira KS, Lyra Jr DP. Assessment of community pharmacists' counselling skills on headache management by using the simulated patient approach: a pilot study. Pharmacy practice. 2013;11(1):3.
32. Aboneh EA, Stone JA, Lester CA, Chui MA. Evaluation of Patient Safety Culture in Community Pharmacies. J Patient Saf. 2020;16(1):e18-e24.
33. Yismaw MB, Tesfaye ZT, Hailu HG, Tegegn HG, Gebreyohannes EA. Evaluation of patient safety culture among community pharmacists in Ethiopia: A cross-sectional study. PLoS One. 2020;15(8):e0237338.
34. Al-Tehewy M, Mohamed S, Ammar N. Patient safety culture among community pharmacists in Cairo. J Egypt Public Health Assoc. 2023;98(1):10.
35. Sivanandy P, Maharajan MK, Rajiah K, Wei TT, Loon TW, Yee LC. Evaluation of patient safety culture among Malaysian retail pharmacists: results of a self-reported survey. Patient preference and adherence. 2016:1317-25.
36. Aboul Fotouh A, Ismail N, Ez Elarab H, Wassif G. Assessment of patient safety culture among health-care providers at a teaching hospital in Cairo, Egypt. EMHJ-Eastern Mediterranean Health Journal, 18 (4), 372-377, 2012. 2012.
37. Cheng H-C, Yen AM-F, Lee Y-H. Factors affecting patient safety culture among dental healthcare workers: A nationwide cross-sectional survey. Journal of dental sciences. 2019;14(3):263-8.
38. Kim NY, Moon KJ. Factors affecting patient safety culture in terms of compliance with preventing bloodborne pathogens among general hospital nurses. BMC nursing. 2021;20(1):5.
39. Nordén-Hägg A, Kälvemark-Sporrong S, Lindblad ÅK. Exploring the relationship between safety culture and reported dispensing errors in a large sample of Swedish community pharmacies. BMC Pharmacology and Toxicology. 2012;13(1):4.
40. Owusu YB, Abouelhassan R, Awaisu A. Evaluation of patient safety culture in community pharmacies in Qatar. International Journal of Clinical Practice. 2021;75(5):e14055.

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