


# National Survey of Medication Safety Practice: Patient Education, Quality Process and Risk Management at Primary Healthcare Centers/Community Pharmacies in Riyadh, Saudi Arabia

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## ABSTRACT

**Objective:** To explore the national medication safety practice such as patient education, quality process and risk management at primary healthcare centers (PHCs) and community pharmacies (CPs) in Riyadh city, Kingdom of Saudi Arabia. **Methods:** This is a four-month cross-sectional medication safety practice survey conducted at PHC pharmacies and CPs in Riyadh city. The survey consisted of the modified version of the Medication Safety Self-Assessment® for Community/Ambulatory Pharmacy from the Institute of Safe Medication Practice (ISMP). The survey consisted of a demographic section and 10 domains with 198 questions. The domains included questions on patient information; drug information; communication of drug orders and other drug information; drug labeling and packaging and nomenclature; use of devices; environmental factors; staff competency and education; patient education; quality processes; and risk management domain. In this study, we emphasized on patient education, quality process and risk management; it is a finding from medication safety self-assessment for community/ambulatory pharmacy in Riyadh city. **Results:** The survey was distributed to 13 PHC pharmacies and 23 CPs. The average score of all ISMP-self assessment of medication safety items at PHCs was  $2.75 \pm 0.36$  (54.94%) (95% confidence interval (95% CI)=2.55–2.95;  $P < 0.05$ ; range=2.04–3.38). The average score of all ISMP-self assessment of medication safety items at CPs was  $3.14 \pm 0.42$  (62.86%) (95% CI=2.90–4.38;  $P < 0.05$ ; range=2.40–3.88). The average score of patient education at PHCs was  $3.04 \pm 0.365$  (60.8%) (95% CI=2.89–3.19;  $P < 0.05$ ; range=2.00–3.73) and at CPs, it was  $3.73 \pm 0.29$  (74.6%) (95% CI=3.61–3.85;  $P < 0.05$ ; range=3.11–4.22). The average score of quality processes and risk management at PHCs was  $2.76 \pm 0.35$  (55.2%) (95% CI=2.64–2.88;  $P < 0.05$ ; range=2.09–3.50) and at CPs, it was  $3.20 \pm 0.38$  (64%) (95% CI=3.07–3.33;  $P < 0.05$ ; range=2.47–3.89). **Conclusion:** The implementation of patient education and quality processes and risk management at PHCs and CPs were inadequate. Targeting to improve all medications safety assessment tools at PHCs and CPs is highly recommended in the Kingdom of Saudi Arabia.

**Key words:** Medication, Safety, Education, Quality, Risk Management, Primary Healthcare Centers, Community Pharmacies, Riyadh, Saudi Arabia.

## INTRODUCTION

GAPC started the implementation of pharmacy strategic plan in 2012.<sup>1</sup> The plan covers all healthcare institutions including hospitals and PHCs. Part of this initiative was to implement national quality management standards in the pharmacy practice. During the period 2012–2015, there was a collaboration between pharmacy and quality management administration at the MOH. The partnership was developed to implement the Saudi standards of quality management to cover all healthcare centers and hospital. The Saudi Center for Healthcare Accreditation released the first edition of the standard, which was updated in 2016.<sup>2</sup> The updated version had necessary elements of medication safety. If the healthcare institutions, particularly hospitals implement all elements of medications safety, then they can obtain the accreditation. Several studies have shown the impact of missing quality management implementation.<sup>3–6</sup> Medication safety practice at CPs have not been included in the updated CBAHI standards. In

2016, the first author of this article published a new initiative project of Saudi-Managed Care Pharmacy System.<sup>7</sup> He suggested implementing new measures for CPs including medication safety-related issues. The community pharmacies had been missed several the practice standard. The initiation of medication safety practice as the assessment tool of prevention of errors in the PHCs and CPs. Few studies have published the finding of self-assessment tools for hospitals.<sup>8,9</sup> According to these articles, the score of patient education and quality management factors were 48–68% and 51–72%, respectively. Another local study conducted during Hajj period showed that the score was 75% for patient education key element and 63.6% for quality management.<sup>10</sup> All previous investigations have been conducted at the hospital pharmacy. However, to the best of our knowledge, there is no study about the self-assessment of medications safety practices with the emphasis of quality factors and risk management. Therefore, in this study, we aimed to ex-

plore the self-assessment of medications safety: quality and risk management at PHCs and CPs in Riyadh city, Saudi Arabia.

## METHODS

This is a four-month cross-sectional medication safety practice survey conducted at PHCs and CPs in Riyadh city. The survey consisted of the modified version of the Medication Safety Self-Assessment<sup>\*</sup> for Community/Ambulatory Pharmacy from the ISMP.<sup>11</sup> It consisted of a demographic section and 10 domains with 198 questions. The domains included patient information; drug information; communication of drug orders and other drug information; drug labeling, packaging and nomenclature; use of devices; environmental factors; staff competency and education; patient education; quality processes; and risk management domain. The survey was conducted at PHC pharmacies of MOH and CPs located in Riyadh city. The responses were collected using 5-point Likert response scale system. The scoring key identified as number (1) was equal to (A): No activity to implement, (2) was equal to (B): Considered, but not implemented, (3) was equal to (C): Partially implemented in some or all areas, (4) was equal to (D): Fully implemented in some areas and (5) was equal to (E): Fully implemented throughout. The survey was distributed to the directors of PHC pharmacies and CPs. The authors distributed the questionnaire and followed-up on a daily basis by physically visiting and by making a telephonic call. The study questionnaire was prepared in an electronic format and it analyzed through survey monkey system and Microsoft Excel version 10. Based on GAPC and CBAHI standards, we suggested some solutions to improve the scores of the medication safety practice and the results of the ISMP self-assessment.<sup>1,2</sup> The 10 domains were divided into several parts for the sake of analysis, discussion and solution. Part one consisted of patient information and part two consisted of drug information. Part three consisted of medication preparation and dispensing (communication of drug orders and other drug information, drug labeling and packaging and nomenclature) and part four consisted of medication administration (drug standardization, storage and distribution, medication devices acquisition, use and monitoring). Part five consisted of environmental factors, workflow, staffing and staff competency and part six consisted of patient education, quality processes and risk management. In this study, we emphasized on part one; it is the finding from medication safety self-assessment for community/ambulatory pharmacy in Riyadh city.

## RESULTS

The survey was distributed to 13 PHC pharmacies and 23 CPs. Most of the PHCs were types M1 and M3 (4 (30.8%) and 3 (23.1%), respectively). Most of the CPs were large (8 (33.3%)) and medium type (8 (33.3%)). The majority of PHCs and CPs had obtained accreditation from the Saudi Commission of Health Specialties (7 (70%) and 20 (87%), respectively). Most of PHCs dispensed more than 100 prescriptions daily (7 (53.9%)), whereas most of the CPs dispensed less than 20 prescriptions daily (11 (45.8%)). Most of the responders in PHCs were female (9 (69.2%)) (4 (30.8%) were males) and in CPs all were males (25 (100%)). Majority of the responders in PHCs were Saudi professionals (12 (92.3%)), whereas all were non-Saudi professionals in CPs (25 (100%)). Most of the responders belonged to the age group of 30–44 years (9 (69.2%)) and most of them in CPs belonged to the age group of 18–29 years (15 (62.5%)). Most of the responders in PHCs had obtained a diploma or BSc degree in Pharmacy or a Master of Science degree in Clinical Pharmacy (2 (22.2%), 3 (33.3%) and 2 (22.2%), respectively). In CPs, majority of them had obtained a BSc degree in Pharmacy (22 (88%)). Most of the pharmacy staff had not obtained accreditation from the Board of Pharmaceutical Specialties (8 (88.9%) and 21 (91.3%) working in the PHCs

and CPs, respectively) (Tables 1 and 2).

The average score of patient education at PHCs was  $3.04 \pm 0.365$  (60.8%) (95% CI=2.89–3.19;  $P < 0.05$ ; range=2.00–3.73), whereas at CPs, it was  $3.73 \pm 0.29$  (74.6%) (95% CI=3.61–3.85;  $P < 0.05$ ; range=3.11–4.22). The average score quality processes and risk management at PHCs were  $2.76 \pm 0.35$  (55.2%) (95% CI=2.64–2.88;  $P < 0.05$ ; range=2.09–3.50) while in the CP was  $3.20 \pm 0.38$  (64%) (95% CI=3.07–3.33;  $P < 0.05$ ; range=2.47–3.89) (Table 3). The highest score of the patient education with Core #16 was obtained for the statement “Pharmacists fully investigate all patient/caregiver concerns and questions about a medication prior to dispensing” (3.6 (72%)) at PHCs, whereas at CPs, the highest score was obtained for the statement “Pharmacists design drug administration schedules that consider the patient’s lifestyle and minimize the number of times per day that medications must be taken for patients at high risk for non-adherence with prescribed medications” (4.22 (84.4%)). The lowest score at PHCs was obtained for the statement “When counseling is provided, the patient’s drug container is opened in front of the patient/caregiver to verify the appearance of the medication” (2.00 (40%)), whereas at CPs, the lowest score was obtained for the statement “In as confidential a manner as possible, pharmacists inquire about the patient’s understanding of the purpose of new medications and refilled prescriptions” (3.33 (66.6%)) (Table 4).

At PHCs and CPs, the highest score of the patient education with Core #17 was obtained for the statement “Pharmacists participate in clinical disease management programs for conditions such as asthma, hypertension, diabetes or hypercholesterolemia” (3.33 (66.6%) and 3.67 (73.4%), respectively). The lowest score at PHCs it was obtained for the statement “In the past year, pharmacists have participated in at least one screening clinic locally to promote early detection of disease” (3.09 (61.8%)) and at CPs, it was obtained for the statement “Pharmacists have participated in promoting, facilitating and providing immunizations to the local community to improve public health” (3.24 (64.8%)) (Table 5). The highest score of quality processes and risk management with Core #18 was obtained for the statement “Error prevention strategies in the pharmacy target the system, not individual practitioners” (3.00 (60%)) at PHCs, whereas at CPs, it was obtained for the statement “Pharmacists and technicians are trained in the clinical and administrative procedures for responding to a serious medication error” (3.63 (72.6%)). The lowest score at PHCs was obtained for the statement “In the individual pharmacy or for chains of pharmacies, error rates are not determined or calculated from practitioner error reports and are not used for internal comparisons” (2.09 (41.8%)), whereas at CPs, it was obtained for the statement “Error prevention strategies in the pharmacy target the system, not individual practitioners involved” (2.68 (53.6%)) (Table 6).

The highest score of quality processes and risk management with Core #19 was obtained for the statement “Management and staff pharmacists/technicians routinely read and use published error experiences from other organizations” (3.18 (63.6%)) at PHCs, whereas at CPs, it was obtained for the statement “A clear definition and examples of medication errors and hazardous situations that should be reported has been established and disseminated to staff (3.79 (75.8%)). The lowest score at PHCs was obtained for the statement “One pharmacist in the individual pharmacy has responsibility for enhancing detection of medication errors, overseeing analysis of their causes and coordinating an effective error reduction plan” (2.33 (46.6%)), whereas at CPs, it was obtained for the statement “Pharmacy management supports practitioner reporting to external reporting programs such as the USP-ISMP Medication Errors Reporting Program and the CDC Vaccine Adverse Reaction Reporting System” (2.58 (51.6%)) (Table 7). The highest score of quality processes and risk management with Core #20 was obtained for the statement “A pharmacist verifies all over-the-counter insulin with the patient/caregiver before the product is dispensed” (3.5 (70%) at PHCs and 3.89 (77.8%) at CPs).

**Table 1: Demographic hospital information.**

Region of work	Primary care centers		Community pharmacies	
	Response Count	Response Percent	Response Count	Response Percent
M1: Referral PHCS for post graduate studies services up to 32,000 of population.	4	30.8%	Super Pharmacy	7 (29.2%)
M2: Referral internal sector PHCS services up to 32,000 of population.	0	0.0%	Large Pharmacy	8 (33.3%)
M3: Referral PHCS services internal cities up to 44,000 of population.	3	23.1%	Medium Pharmacy	8 (33.3%)
M4: Referral PHCS services internal cities with housing up to 32,000 of population	1	7.7%	Small Pharmacy	1 (4.2%)
M5: Referral external sector PHCS services up to 16,000 of population.	0	0.0%	Other (please specify)	0 (0.0%)
M6: Referral external sector with housing PHCS services up to 16,000 of population.	0	0.0%	Answered question	24
M7: Referral small PHCS services up to 32,000 of population.	1	7.7%	Skipped question	1
A0: primary care centers located at more than 35 Km distance and services 2,000-9,000 of population	2	15.4%		
B1: Big primary care center located at outside cities and within, 35 Km distance from referral PHCS, services 15,000-25,000 of population.	1	7.7%		
B2: Big primary care center located at outside cities and within, 35 Km distance from referral PHCS, services 12,000-15,000 of population.	0	0.0%		
B3: Big primary care center located at outside cities and within, 35 Km distance from referral PHCS, services 3,000-12,000 of population.	0	0.0%		
Other (please specify)	1	7.7%		
Answered question	13			
Skipped question	0			
<b>The hospital accreditation</b>				
CIBAHI	1	10.0%	3	13.0%
Joint Commotion USA	0	0.0%	0	0.0%
Canada	1	10.0%	0	0.0%
Saudi commission of health accreditation	7	70.0%	20	87.0%
Non accredited	1	10.0%	0	0.0%
Answered question	10		23	
Skipped question	3		2	
<b>Number of prescriptions per day</b>				
No more than 20 prescriptions	0	0.0%	11	45.8%
No more than 30 prescriptions	0	0.0%	5	20.8%
No more than 50 prescriptions	1	7.7%	2	8.3%
No more than 70 prescriptions	1	7.7%	1	4.2%
No more than 100 prescriptions	3	23.1%	4	16.7%
more than 100 prescriptions	4	30.8%	1	4.2%
100-499 prescriptions	2	15.4%	0	0.0%
500-999 prescriptions	0	0.0%	0	0.0%
= or > 1000 prescriptions	1	7.7%	0	0.0%
Other (please specify)	1	7.7%	0	0.0%
Answered question	13		24	
Skipped question	0		1	

**Table 2: Demographic information regarding responder's qualifications.**

Gender	Primary care centers		Community pharmacies	
	Response Count	Response Percent	Response Count	Response Percent
Female	9	69.2%	0	0.0%
Male	4	30.8%	25	100.0%
Answered question	13		25	
Skipped question	0		0	
<b>Nationality</b>				
Saudi	12	92.3%	0	0.0%
Non- Saudi	1	7.7%	25	100.0%
Answered question	13		25	
Skipped question	0		0	
<b>Age</b>				
<18	1	7.7%	0	0.0%
18 - 29	3	23.1%	15	62.5%
30 - 44	9	69.2%	9	37.5%
45 - 59	0	0.0%	0	0.0%
60+	0	0.0%	0	0.0%
Answered question	13		24	
Skipped question	0		1	
<b>Academic Qualification (s):</b>				
Diploma Pharmacy	2	22.2%	1	4.0%
Bsc. Pharm	3	33.3%	22	88.0%
M.S	0	0.0%	0	0.0%
Msc. Clinical Pharmacy	2	22.2%	1	4.0%
Pharm.D.	1	11.1%	2	8.0%
Ph.D	0	0.0%	1	4.0%
MBA	0	0.0%	1	4.0%
Pharmacy Residency Two years (R1)	0	0.0%	0	0.0%
Pharmacy Residency one year (R2)	0	0.0%	0	0.0%
Fellowship	0	0.0%	0	0.0%
Other (please specify)	1	11.1%	1	4.0%
Answered question	9		25	
Skipped question	4		0	
<b>Board of Pharmaceutical Specialty</b>				
Board Certified Ambulatory Care Pharmacist (BCACP)	1	11.1%	0	0.0%
Board Certified Critical Care Pharmacist (BCCCP)	0	0.0%	1	4.3%
Board Certified Nuclear Pharmacist (BCNP)	0	0.0%	0	0.0%
Board Certified Nutrition Support Pharmacist (BCNSP)	0	0.0%	0	0.0%
Board Certified Oncology Pharmacist (BCOP)	0	0.0%	0	0.0%
Board Certified Pediatric Pharmacy Specialist (BCPPS)	0	0.0%	1	4.3%
Board Certified Pharmacotherapy Specialists (BCPS)	0	0.0%	0	0.0%
Board Certified Psychiatric Pharmacist (BCPP)	0	0.0%	0	0.0%
Non	8	88.9%	21	91.3%
Answered question	0		0	

**Table 3: The scores key elements of Institute of Safe Medication Practice (ISMP) medication safety: Patient Education and Quality Processes and risk management at primary healthcare center/community pharmacy in Riyadh city.**

Medication Safety Items	Type of pharmacy	Mean score	SD	Confidence Level (95%)	Range	Median	Mode	Percent	SD %	Confidence Level (95%)	Range %	USA, 2000 Scores %	USA, 2011 Scores %	KSA, 2017 Scores %
IX	PHCs	3.04	0.365	0.15	2.00 – 3.73	3.09	3.09	60.8	7.3	3	40.00 – 74.60	48.00	68.00	75.00
	CP	3.73	0.29	0.12	3.11 – 4.22	3.82	3.67	74.6	5.8	2.4	62.20 – 84.40			
X	PHCs	2.76	0.35	0.12	2.09 – 3.50	2.82	3.00	55.2	7	2.4	41.80 – 76.00	51.00	72.00	63.60
	CP	3.20	0.38	0.13	2.47 – 3.89	3.31	3.37	64	7.6	2.6	49.40 – 77.80			

**Table 4: The highest and lowest scores items of domain patient education core # 16**

IX: Patient Education

	Key elements										Response Count
	A	B	C	D	E	Rating Average	Percent				
	<b>Core # 16: Patients are included as active partners in their care through education about their medications and ways to avert errors</b>										
	1	2	3	4	5						
	The highest scores items of Primary care center pharmacy										
152	1	1	2	3	3	3.60	72				10
	Pharmacists fully investigate all patient/caregiver concerns (e.g., affordability, inability to swallow, difficulty adhering to directions, etc.) and questions about a medication prior to dispensing.										
	The highest scores items of community pharmacy										
161	1	0	3	4	10	4.22	84.4				18
	Pharmacists design drug administration schedules (in cooperation with the patient's physician as necessary) that consider the patient's lifestyle and minimize the number of times per day that medications must be taken for patients at high risk for non-adherence with prescribed medications.										
	The lowest scores items of Primary care center pharmacy										
149	6	0	4	1	0	2.00	40				11
	When counseling is provided, the patient's drug container is opened in front of the patient/caregiver to verify the appearance of the medication.										
	The lowest scores items of community pharmacy										
147	0	8	2	2	6	3.33	66.6				18
	In as confidential a manner as possible, pharmacists inquire about the patient's understanding of the purpose of new medications and refilled prescriptions.										

**Table 5: The highest and lowest scores items of domain patient education core # 17.**

IX: Patient Education									
Key elements		A	B	C	D	E	Rating Average	Percent	Response Count
Core #17: Pharmacists establish and participate in community-based disease prevention and monitoring programs to promote health and ensure appropriate therapy and outcomes of medication use.		1	2	3	4	5			
	The highest scores items of Primary care center pharmacy								
163	Pharmacists participate in clinical disease management programs for conditions such as asthma, hypertension, diabetes or hypercholesterolemia.	3	0	3	2	4	3.33	66.6	12
	The highest scores items of community pharmacy								
163	Pharmacists participate in clinical disease management programs for conditions such as asthma, hypertension, diabetes or hypercholesterolemia.	3	0	3	6	6	3.67	73.4	18
	The lowest scores items of Primary care center pharmacy								
164	In the past year, pharmacists have participated in at least one screening clinic locally to promote early detection of disease.	2	1	3	4	1	3.09	61.8	11
	The lowest scores items of community pharmacy								
165	Pharmacists have participated in promoting, facilitating and providing immunizations to the local community to improve public health.	1	5	4	3	4	3.24	64.8	17

**Table 6: The highest and lowest scores items of domain quality processes and risk management core # 18.**

X: Quality Processes and risk management									
Key elements		A	B	C	D	E	Rating Average	Percent	Response Count
Core #18: A non-punitive, system-based approach to error reduction is in place and supported by pharmacy owners or senior management.		1	2	3	4	5			
	The highest scores items of Primary care center pharmacy								
166	Error prevention strategies in the pharmacy target the system, not individual practitioners (e.g., in addressing problems, a change in the pharmacy's process or practice is sought, rather than focusing on the role of the specific individual(s) involved).	2	2	3	2	2	3.00	60	11
167	Practitioners and other staff report and openly discuss errors without undo embarrassment or fear of reprisal from pharmacy management.	3	1	2	3	2	3.00	60	11
168	Pharmacists and technicians are trained in the clinical and administrative procedures for responding to a serious medication error.	3	0	4	2	2	3.00	60	11
169	If the pharmacy discovers that an error has led to improper medication dispensing, regardless of the level of harm that results, the error is honestly disclosed to the patient/caregiver/family in a timely manner.	2	1	5	1	2	3.00	60	11
170	If the pharmacy discovers that an error has led to improper medication dispensing and self-administration, regardless of the level of harm that results, the error is honestly disclosed to the prescriber in a timely manner.	2	2	3	2	2	3.00	60	11
175	Management provides positive incentives for individuals to report errors and pharmacists and technicians are thanked and praised for detecting and reporting errors.	1	2	5	2	1	3.00	60	11
	The highest scores items of community pharmacy								
168	Pharmacists and technicians are trained in the clinical and administrative procedures for responding to a serious medication error.	0	2	9	2	6	3.63	72.6	19
169	If the pharmacy discovers that an error has led to improper medication dispensing, regardless of the level of harm that results, the error is honestly disclosed to the patient/caregiver/family in a timely manner.	1	4	5	0	9	3.63	72.6	19
	The lowest scores items of Primary care center pharmacy								
174	In the individual pharmacy or for chains of pharmacies, error rates are not determined or calculated from practitioner error reports and are not used for internal (pharmacist-to-pharmacist) or external (pharmacy-to-pharmacy) comparisons.	4	3	3	1	0	2.09	41.8	11
	The lowest scores items of community pharmacy								
166	Error prevention strategies in the pharmacy target the system, not individual practitioners (e.g., in addressing problems, a change in the pharmacy's process or practice is sought, rather than focusing on the role of the specific individual(s) involved).	7	3	3	1	5	2.68	53.6	19

**Table 7: The highest and lowest scores items of domain quality processes and risk management core # 19.**

X: Quality Processes and risk management

Key elements		A	B	C	D	E	Rating Average	Percent	Response Count
<b>Core #19: Practitioners are stimulated to detect and report errors and teams (or individual practitioners in small pharmacies) regularly analyze errors that have occurred within the organization and in other organizations for the purpose of redesigning systems to best support safe practitioner performance</b>		1	2	3	4	5			
The highest scores items of Primary care center pharmacy									
187	Management and staff pharmacists/technicians routinely read and use published error experiences from other organizations to proactively target improvements in the medication dispensing process.	1	1	6	1	2	3.18	63.6	11
The highest scores items of community pharmacy									
180	A clear definition and examples of medication errors and hazardous situations that should be reported has been established and disseminated to staff.	1	3	4	2	9	3.79	75.8	19
The lowest scores items of Primary care center pharmacy									
182	One pharmacist in the individual pharmacy has responsibility for enhancing detection of medication errors, overseeing analysis of their causes and coordinating an effective error reduction plan (with corporate support as applicable).	4	4	2	0	2	2.33	46.6	12
The lowest scores items of community pharmacy									
190	Pharmacy management supports practitioner reporting to external reporting programs such as the USP-ISMP Medication Errors Reporting Program and the CDC Vaccine Adverse Reaction Reporting System.	5	4	7	0	3	2.58	51.6	19

**Table 8: The highest and lowest scores items of domain quality processes and risk management core # 20.**

X: Quality Processes and risk management

Key elements		A	B	C	D	E	Rating Average	Percent	Response Count
<b>Core #20: Simple redundancies that support a system of independent double checks or an automated verification process are used for vulnerable parts of the dispensing system to detect and correct serious errors before they reach patients.</b>		1	2	3	4	5			
The highest scores items of Primary care center pharmacy									
196	A pharmacist verifies all over-the-counter insulin with the patient/caregiver before the product is dispensed.	0	3	3	3	3	3.50	70	12
The highest scores items of community pharmacy									
196	A pharmacist verifies all over-the-counter insulin with the patient/caregiver before the product is dispensed.	0	4	3	2	9	3.89	77.8	18
The lowest scores items of Primary care center pharmacy									
192B	Where electronic prescribing (e.g., prescription sent electronically via computer/hand held device) is available and used, a pharmacist reviews the order in the computer before generating a label from which the drug order is filled.	5	1	3	2	0	2.18	43.6	11
The lowest scores items of community pharmacy									
195	Both the medication base product and the mixing solution/diluents used for reconstituted products are checked and documented with initials on the prescription by at least a pharmacist and one other person	6	6	2	2	3	2.47	49.4	19

The lowest score at PHCs was obtained for the statement “Where electronic prescribing is available and used, a pharmacist reviews the order in the computer before generating a label from which the drug order is filled” (2.18 (43.6%)), whereas at CPs, it was obtained for the statement “Both the medication base product and the mixing solution/diluents used for reconstituted products are checked and documented with initials on the prescription by at least a pharmacist and one other person” (2.47 (49.4%)) (Table 8).

## DISCUSSION

The patient education and quality management programs were goals of the strategic pharmacy at the MOH in the KSA.<sup>1</sup> There were separated committees for each project. The committee consisted of representatives from each region to follow the program's implementation at hospitals and PHCs. CPs were not included in both programs. However, the patient education and quality management programs were implemented

through self-improvement for all primary care center and community pharmacy. We explored both programs as related to medication safety. The results of this study showed that the patient education scores of CPs were better than that of PHCs. This is related to more effort for competition in the pharmacy market. The results regarding CPs were similar to the results of previous international and local studies, whereas the results related to PHCs were lower than that of previous international and regional studies.<sup>8-10</sup> Because it was newly established. The results of both PHCs and CPs in quality management are almost the same. However, both results were found to be lower than that of previous international and local studies.<sup>8-10</sup> This is because it was newly established at PHCs and not well developed at CPs.

The lowest score related to patient education at PHCs and CPs were related to some skills in patient counseling. Both demand for education and training courses improve their skills. Moreover, some services need to be added to both types of pharmacies. This includes the clinic for screening the disease and immunization services. Both services are not allowed in the pharmacy law. The law should be updated. The findings of cores # 18 and # 19 of the medication safety demand prevention measures and documentation of adverse drug reactions at PHCs and CPs. The national system of medication errors education and training is mandated. The lowest safety score with an emphasis on the quality management at PHCs; that's related to the missing of an electronic prescribing. Most of primary care center pharmacy not started the computerized physician order enter. In the CPs the lowest safety scores was the standardized of extemporaneous preparation; that's excepted because the unified extemporaneous preparations not excised. The PHCs and CPs need more efforts to implement the medication safety assessment tools with emphasis on the patient counseling and quality management system and risk management in the KSA.

## CONCLUSION

Half of medication safety assessments tool with emphasis on the patient counseling and quality management and risk management is not implemented in the PHCs and CPs. Several medication safety tools should be implemented with emphasis on e-prescribing, patient education, risk managements

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## CONFLICT OF INTEREST

None

## ABBREVIATIONS

**PHCs:** Primary healthcare centers; **CPs:** Community pharmacies; **CI:** Confidence interval; **CBAHI:** Saudi Central Board of Accreditation for Healthcare Institutions; **ISMP:** Institute of Safe Medication Practice; **MOH:** Ministry of Health; **KSA:** Kingdom of Saudi Arabia; **USA:** United States of America.

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