National Survey of Medication Safety Practice: Preparation of Medication and Dispensing at Primary Healthcare Centers/Community Pharmacies in Riyadh, Saudi Arabia

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ABSTRACT

Objective: To explore the national medication safety practice in terms of medication preparation and dispensing at Primary Healthcare Centers (PHCs) and Community Pharmacies (CPs) in Riyadh, Kingdom of Saudi Arabia. **Methods:** This is a 4-month cross-sectional medication safety practice survey conducted at PHCs and CPs in Riyadh. The survey consisted of the modified version of the Medication Safety Self-Assessment® for Community/Ambulatory Pharmacy from the Institute for Safe Medication Practices (ISMP). The survey consisted of a demographic section and 10 domains with 198 questions. The 10 domains included patient information; drug information; communication of drug orders and other drug information; drug labeling, packaging and nomenclature; use of medical devices; environmental factors; staff competency and education; patient education; quality processes; and risk management. This study emphasizes on the medication preparation and dispensing as per the Medication Safety Self-Assessment for Community/Ambulatory Pharmacy, Riyadh. **Results:** The survey was distributed to 13 PHCs and 23 CPs. The average score of all the ISMP self-assessment of medication safety items at PHCs was 2.75±0.36 (54.94 %) with 95% confidence interval (95% CI) = 2.55–2.95 (P<0.05; range = 2.04–3.38). The average score of all the ISMP self-assessment of medication safety items at CPs was 3.14±0.42 (62.86%) with 95% CI = 2.90–4.38 (P<0.05; range = 2.40–3.88). The average score of the communication of drug orders and other drug information domain at all hospitals were 2.57±0.38 (51.4 %) with 95% CI = 2.36–2.78 (P<0.05; range = 1.92–3.25) at PHCs and in the CPs, it was 2.44±0.35 (48.8 %) with 95% CI = 2.245–2.635 (P<0.05; range = 2.00–3.09). The average score of drug labeling, packaging and nomenclature domain at all hospitals was 2.57± 0.41 (51.4 %) with 95% CI = 2.35–2.79 (P<0.05; range = 1.83–3.08) at PHCs and in CPs, it was 3.2±0.59 (64%) with 95% CI = 2.89–3.51, (P<0.05; range = 2.20–4.05). **Conclusion:** Fifty percent of medication safety critical elements of ISMP standards was implemented during the preparation and dispensing of medication in the PHCs and CPs. Targeting to improve medication safety key at PHCs and CPs to prevent drug-related problems is required in the Kingdom of Saudi Arabia.

Key word: Adverse Drug Reaction, System, Pharmaceutical Care, Ministry of Health, Saudi Arabia.

INTRODUCTION

Medication errors are a serious problem that undermines patient safety and increases the physical cost of healthcare. In the United States, medication errors harm at least 1.5 million residents annually and treating adverse drug reactions caused due to medication errors cost at least 3.5 billion US dollars annually.1 In order to reduce medication errors, it is recommended that reliable methods of assessment of medication safety practices be developed. ISMP, a nonprofit organization, is devoted entirely to prevent medication errors, to promote safe medication use and develop reliable methods to improve medication safety. In relation to this, the ISMP issued 10 key elements of the medication use system, where they included all factors affected the medication-use process in community/ambulatory pharmacy.

In 2012, MOH in Saudi Arabia had established a strategic plan to develop pharmaceutical care at all hospital pharmacies, CPs and PHCs pharmacies across Saudi Arabia.2 During this period, many of the Medication Safety Programs were developed and updated (e.g. Medication Errors Reporting System, Adverse Drug Reaction Reporting System, Drug Quality Reporting System and Medication Safety Program in PHCs. From 2013 to 2015, several policies and procedures related to the preparation of drug were launched. In addition, a collection of books on preparation, dispensing and disposal of medications was distributed to all hospital and PHC pharmacies. This step is very essential to reduce and prevent drug-related problems, decrease mortality and morbidity and prevent the economic burden on the healthcare system.3,4 To achieve this, tools that screen for drug safety culture among to the ten essential performance elements with a focus on medication preparation and dispensing

In the United States, two studies have been conducted (In 2000 and 2011) on the safety of drugs using self-assessment tools; they found a marked improvement in most of the major components in the survey questionnaire.5,6 The overall score drastically increased from 56% to 71%. The aver-

age score of the domain "communication of drug orders and other drug information" increased from 47% to 74% and that of the "Drug labeling, packaging and nomenclature" domain increased from 61% to 74%. Another a local study conducted in Saudi hospitals included 11 hospitals in Makkah.7 The average score of the "Communication of drug orders and other drug information" domain at all hospitals was 70.60% and the average score of "Drug labeling, packaging and nomenclature" domain at all hospitals was 71.4%. All the previous studies have been conducted at hospital pharmacies.5,6 However, to the best of our knowledge, there is no investigation conducted in the KSA, Gulf and Middle Eastern countries about self-assessment of medication at PHCs and PCs. Therefore, in this study, we aimed to explore the national practice of drug safety in CPs and PHCs pharmacies in Riyadh, Saudi Arabia with an emphasis on the medication preparation and dispensing (Communication of drug orders and other drug information and drug labeling, packaging and nomenclature).

MATERIALS AND METHODS

METHODS

This is a 4-month cross-sectional medication safety practice survey conducted at the pharmacies of the PHCs and CPs in Riyadh city. The survey has been modified from ISMP Medication Safety Self-Assessment® for Community/Ambulatory Pharmacy.8 It consisted of a demographic section and 10 domains with 198 questions. The 10 domains included patient information; drug information; communication of drug orders and other drug information; drug labeling, packaging and nomenclature; use of medical 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 5-point Likert response scale system was used to obtain responses. The scoring key was identified as number (1) equal to (A): No activity to implement, (2) equal to (B): Considered, but not implemented, (3) equal to (C): Partially implemented in some or all areas, (4) equal to (D): Fully implemented in some areas and (5) 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 either physically visiting or by making a telephonic call. The survey was prepared in an electronic format and was analyzed through the Survey Monkey system and Microsoft Excel version 10. Based on GAPC and CBAHI standards, we suggested some solutions to improve the scoring of medication safety culture and of ISMP self-assessment.2,9 The 10 domains were divided into parts for analysis, discussion and solution. Part one consisted of patient information. Part two consisted of drug information. Part three consisted of medication preparation and dispensing (Communication of drug orders and other drug information and drug labeling and packaging and nomenclature). Part four consisted of medication administration (Drug standardization, storage and distribution; and medication devices acquisition, use and monitoring). Part five consisted of environmental factors, workflow and staffing and staff competency. Finally, part six consisted of patient education, quality processes and risk management. In this study, we emphasized on part one; it is a finding from medication safety self-assessment for community/ambulatory pharmacy in Riyadh city.

RESULTS

The survey was distributed to 13 PHCs 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 PHC pharmacies and CPs had obtained accreditation from the Saudi Commission of Health Specialties (7 (70%) and 20 (87%), respectively). Most of the PHCs dispensed ≥100 prescriptions daily (7 (53.9%)), whereas CPs dispensed <20 prescriptions daily (11 (45.8%)). Most of the responders in PHC pharmacies were females (9 (69.2%)) (4 (30.8%) were males) and in CPs, all the responders were males (25 (100%)). The majority of responders in PHC pharmacies was Saudi 12 (92.3%) while non-Saudi 25 (100%) in the CP. Most of the responders in PHCs were in the age group of 30–44 years (9 (69.2%)), whereas those in CPs were in the age group of 18–29 years (15 (62.5%)). Most of the responders in PHCs had obtained a diploma, a Bachelor of Science in Pharmacy, or a Master of Science in Clinical Pharmacy degree (2 (22.2%), 3 (33.3%) and 2 (22.2%) respectively). Most of the responders in CPs had obtained a Bachelor of Science in Pharmacy degree (22 (88%)). The majority of staff working in the PHCs and CPs had not obtained accreditation from the Board of Pharmaceutical Specialties (8 (88.9%) and 21 (91.3%) respectively) (Table 1: Demographic Information Regarding Hospital.s 1 and 2). The average score of all ISMP self-assessment items of medication safety at PHCs was 2.75±0.36 (54.94 %) with a 95% CI = 2.55–2.95 (P<0.05; range = 2.04–3.38). The average score of all ISMP self-assessment items of medication safety at CPs was 3.14±0.42 (62.86%) with a 95% CI = 2.90–4.38 (P<0.05; range = 2.40–3.88). The average score of the communication of drug orders and other drug information domain at PHCs was 2.57±0.38 (51.4 %) with a 95% CI = 2.36–2.78 (P<0.05; range = 1.92–3.25), whereas the average score for the same domain in the CPs was 2.44±0.35 (48.8%) with a 95% CI = 2.245–2.635 (P<0.05; range = 2.00–3.09). The average score of the drug labeling, packaging and nomenclature domain at PHCs was 2.57±0.41 (51.4 %) with a 95% CI = 2.35–2.79 (P<0.05; range = 1.83–3.08), whereas the average score for the same domain in the CPs was 3.2±0.59 (64%) with a 95% CI (= 2.89–3.51 (P<0.05; range = 2.20–4.05) (Table 3).

In the case of PHCs pharmacies, the highest score of the communication of drug orders key element was obtained for the statement "Orders include sufficient space to clearly activate desired orders" (3.08 (61.6%)), whereas the highest score in CPs was for the statement "Orders include sufficient space above, below and between 'fill in' prompts to prevent crowding of entries and avoid stray marks from interfering with other 'fill in' prompts" (3.09 (61.8%)). In the case of PHCs pharmacies, the lowest score was obtained for the statement "The pharmacy is able to receive prescriptions sent electronically from the physician's office" (1.92 (38.4%)), whereas in CPs, the lowest score was obtained for "If the prescription is received on paper, scanning and prescription imaging is used in the dispensing process to show the original prescription on the computer screen" (2.00 (40%)) (Table 4). In the case of PHC pharmacies, the highest score in the drug labeling, packaging and nomenclature domain was for the statement "The key element in core strategies undertaken to minimize the possibility of errors was the products with look-alike drug names and packaging segregated and not stored alphabetically" (3.08 (61.6%)), whereas the highest score of the same domain in CPs was obtained for "When two different products exist that have dangerously similar labeling/packaging, a conscious effort is made by the pharmacy" (4.05 (81%)). In the PHCs pharmacies, the lowest score was obtained for the statement "Computer mnemonics are designed to minimize selection of the wrong medication or strength" (2.00 (40%)), whereas the same in CPs was obtained for "Special alerts are built into the computer as necessary to remind practitioners about problematic or look-alike drug names, packaging, or labeling" (2.20 (44%)) (Table 5).

In the case of PHCs and CPs, the highest score for the domain drug labeling, packaging and nomenclature as key element with core Prescription labels clearly identify was the "All prescription labels include the expiration date or beyond use date" (3.0 (60%) and 3.60 (72%), respectively). The lowest score was obtained for the statement 'during prescrip-

Table 1: . Demographic Information Regarding Hospital

	Primary care centers		Community pharmacies	
Region of work	**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 to16, 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			
The hospital accreditation				
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	
Number of prescriptions per day				
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.

	Primary care center		Community pharmacies	
Age	**Response Count**	**Response Percent**	**Response Count**	**IUPA Response Percent**
Female	9	69.2%	0	0.0%
Male	4	30.8%	25	100.0%
Answered question	13		25	
Skipped question	0		0	
Nationality				
Saudi	12	92.3%	0	0.0%
Non- Saudi	1	7.7%	25	100.0%
Answered question	13		25	
Skipped question	0		0	
Age				
<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	
Academic Qualification (s):				
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	
Board of Pharmaceutical Specialty				
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	
Skipped question	9		23	

Table 3: Scores of Key Elements of Institute for Safe Medication Practices (ISMP) Medication Safety: Preparation and Dispensing at Primary Healthcare Center/ Community Pharmacy in Riyadh

	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 %
III	Communication of drug orders and other drug information	PHCS	2.57	0.38	0.21	1.92 – 3.25	2.5	2.5	51.4	7.6	4.2	38.40 – 65.00	47.00	74.00	70.60
		CP	2.44	0.35	0.195	2.00 – 3.09	2.57	2	48.8	7	3.9	40.00 – 61.80			
IV	Drug Labeling and Packaging and Nomenclature	PHCS	2.57	0.41	0.22	1.83 – 3.08	2.71	2.92	51.4	8.2	4.4	36.60 – 61.60	61.00	74.00	71.4
		CP	3.2	0.59	0.31	2.20 – 4.05	3.21	non	64	11.8	6.2	44.00 – 81.00			

tion order entry, the pharmacy computer system suggests appropriate auxiliary labels to be affixed manually prior to dispensing" (1.83 (36.6%) and 2.50 (50%) at for PHCs and CPs, respectively) (Table 6).

DISCUSSION

The third stage of medications distribution process is preparation and dispensing. This step is performed by the pharmacist. The majority of medication errors in the PHCs and CPs was recorded to be dispensing errors. All international and national pharmacy standards provide guidelines for the preparation and dispensing of medications.10,11 They set up several guidelines in order to prevent medication error. Moreover, several international pharmacy societies set up regulations for dispensing of drugs.12,13 The GAPC setup the medications safety practice in order to oversee the steps followed by the pharmacist at the dispensing stage.3 The authors tried to explore the national survey of medications safety practice by using ISMP self-assessment tools. The results of this study showed that the communication of drug information and related issues at PHCs and CPs were almost the same. However, both types of pharmacies showed lower values than those performed in an international and local setting.5-7 Several aspects of preparation and dispensing medications that should have been made available at the hospital did not exist at both PHCs and CPs. The results of drug packaging, labeling and nomenclature of PHCs were lower than that of CPs. This might be due to the more advanced pharmacy distribution system at CPs, which may not be available at PHCs. Both PHCs and CPs showed lower scores of drug packaging, labeling than that of previous international and national studies. After the implementation of the new pharmacy drug distribution system, the scores increased. The highest score was obtained for dispensing of medications at both PHCs and CPs. This was expected because both PHCs and CPs had regulation and law had been implemented and required the space available for the drug distribution system.

The lowest score was obtained for the electronic drug distribution system because most of PHCs and CPs do not have a computerized physician order entry system. The highest score was obtained for the domain drug packaging, labeling and nomenclature at PHCs and PCs with respect to the implementation of look-a-like and a sound-alike system. It was part of the medication safety program. The lowest score was obtained for the absence of the alerting system in electronic prescriptions. That was expected as the electronic prescription system did not exist at both types of pharmacies. In the drug labeling safety elements, the most persuasive points were clear drug labeling at PHCs and CPs. This was expected in practice. Most of the CPs had labels, whereas only two-thirds of the PHCs had labels. Some pharmacies missed labels and not followed the guidelines. The weak points at PHCs and CPs were related to labels connected to electronic prescriptions. This is expected because most of the pharmacies do not have Computerized Physician Order Entry (CPOE). We highly recommend that the updates be performed with respect to system preparation, dispensing and prescribing and converting it to an electronic system at PHCs and CPs in the KSA.

CONCLUSION

The self-assessment of medication safety study in PHCs and CPs was first conducted in the KSA, Gulf and Middle East countries. Approximately half of the medication safety key elements were implemented during the preparation and dispensing stage. Implementation of Computerized Physician Order Entry is required to prevent drug-related problems and improve medication safety system. The annual or biannual study of self-assessment of medication safety in PHCs and CPs is highly appreciated in the Kingdom of Saudi Arabia.

Table 4: Scores of Items of Communication of Drug Orders and other Drug Information Domain.

III: Communication of drug orders and other drug information									
No	**Key elements** **Streamlined, standardized and increase automated methods of communicating**	**E** **1**	**D** **2**	**C** **3**	**B** **4**	**A** **5**	**Rating Average**	**Percent**	**Response Count**
	The highest scores items for Primary care center pharmacy								
34	O) Orders include sufficient space to clearly activate desired orders e.g., adequate space between check boxes to prevent intended check mark from marking more than one box; between orders that must be circled to activate.	3	2	2	1	4	3.08	61.6	12
35	P) Orders include sufficient space above, below and between "fill in" prompts to prevent crowding of entries and avoid stray marks from interfering with other "fill in" prompts.	2	2	3	1	4	3.25	65	12
	The highest scores items for community pharmacy								
60	P) Orders include sufficient space above, below and between "fill in" prompts to prevent crowding of entries and avoid stray marks from interfering with other "fill in" prompts.	2	7	4	5	4	3.09	61.8	22
51	N) Orders include a prompt for prescriber's signature, printed name and beeper or phone number (and ID number, if required) which is consistent with the standard format.	4	6	4	6	2	2.82	56.4	22
	The lowest scores items for Primary care center pharmacy								
39	A) The pharmacy is able to receive prescriptions sent electronically from the physician's office (e.g., from a hand-held device or computer) to a pharmacy computer in a standard format.	7	2	1	1	1	1.92	38.4	12
41	C) If the prescription is received on paper, scanning and prescription imaging is used in the dispensing process to show the original prescription on the computer screen.	5	4	2	1	0	1.92	38.4	12
	The lowest scores items for community pharmacy								
41	C) If the prescription is received on paper, scanning and prescription imaging is used in the dispensing process to show the original prescription on the computer screen.	9	7	4	1	1	2.00	40	22
43	E) "Sig" codes used by pharmacists and technicians during order entry are standardized in each pharmacy (and throughout a chain of stores) and reviewed regularly to evaluate error potential.	12	4	4	1	2	2.00	40	23

Table 5: Scores of Items of Drug Labeling, Packaging and Nomenclature Core # 5 Domain.

IV: Drug Labeling and Packaging and Nomenclature									
No	**Key elements** **Core #5: Strategies are undertaken to minimize the possibility of errors with drug products that have similar or confusing manufacturer labeling/packaging and/or drug names that look and sound alike**	**A** 1	**B** 2	**C** 3	**D** 4	**E** 5	**Rating Average**	**Percent**	**Response Count**
	The highest scores items of Primary care center pharmacy								
58	G) Products with known look-alike drug names are stored separately and not alphabetically, or are otherwise clearly differentiated from one another if they remain next to each other.	2	1	5	2	2	3.08	61.6	12
57	F) When drugs have the same name but different routes of administration (e.g., ophthalmic vs. otic), steps are taken (e.g., auxiliary labels, change in storage location, purchase from different manufacturer, notation in the computer, etc.) to prevent dispensing errors.	2	3	3	2	2	2.92	58.4	12
	The highest scores items of community pharmacy								
54	C) When two different products exist that have dangerously similar labeling/packaging, a conscious effort is made by the pharmacy (and corporate purchasing staff, if applicable) to seek an alternate manufacturer for one of the products.	1	0	3	9	7	4.05	81	20
52	A) Pharmacists regularly review current professional literature (at the corporate level also, if applicable) to identify drug labeling, packaging and nomenclature problems and action is taken to prevent errors with these drugs.	0	4	1	5	9	4.00	80	19
	The lowest scores items of Primary care center pharmacy								
55	D) Special alerts are built into the computer as necessary to remind practitioners about problematic or look-alike drug names, packaging, or labeling.	6	1	2	3	0	2.17	43.4	12
59	H) Computer mnemonics are designed to minimize selection of the wrong medication or strength (e.g., arranged to prevent look-alike drug names from appearing in alphabetical order on the computer screen at the same time, or differentiated from one another through use of font enhancements on the computer screen, etc.).	5	3	3	1	0	2.00	40	12
	The lowest scores items of community pharmacy								
56	E) Auxiliary warnings, labels with exaggerated fonts, or other label enhancements are used on packages and storage bins of drugs with problematic names, packages and labels.	4	6	5	3	2	2.65	53	20
55	D) Special alerts are built into the computer as necessary to remind practitioners about problematic or look-alike drug names, packaging, or labeling.	8	6	2	2	2	2.20	44	20

Table 6: Scores of Items of Drug Labeling, Packaging and Nomenclature Core #6 Domain.

IV: Drug Labeling and Packaging and Nomenclature									
No	Key elements Core #6: Prescription labels clearly identify the patient, product, directions for use, the dispensing pharmacy and any other important information that the patient may need to take the medication accurately and safely	A 1	B 2	C 3	D 4	E 5	Rating Average	Percent	Response Count
	The highest scores items of Primary care center pharmacy								
62 80	K) All prescription labels include the expiration date or beyond use date.	3	1	2	1	3	3.00	60	10
63	L) The pharmacy uses appropriate foreign language labels for patients who need them.	4	1	1	4	2	2.92	58.4	12
64	M) Appropriate labels are used for the visually impaired (e.g., larger font, Braille, etc.)	4	2	1	1	4	2.92	58.4	12
	The highest scores items of community pharmacy							0	
62 80	K) All prescription labels include the expiration date or beyond use date.	1	5	3	3	8	3.60	72	20
63	L) The pharmacy uses appropriate foreign language labels for patients who need them.	1	4	6	3	6	3.45	69	20
	The lowest scores items of Primary care center pharmacy							0	
60	I) A prescription label is generated from a laser printer with font enhancements used for critical information such as name of drug and dose.	6	2	3	0	1	2.00	40	12
65B	O) During prescription order entry, the pharmacy computer system suggests appropriate auxiliary labels to be affixed manually prior to dispensing.	5	4	3	0	0	1.83	36.6	12
	The lowest scores items of community pharmacy							0	
66	P) If the prescriber provides the purpose of the medication on the prescription, the indication is included on the patient's prescription container label.	7	1	5	4	3	2.75	55	20
65B	O) During prescription order entry, the pharmacy computer system suggests appropriate auxiliary labels to be affixed manually prior to dispensing.	6	5	3	5	1	2.50	50	20

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS

PHCs: Primary healthcare centers; **CPs:** community pharmacies; **CBAHI:** Saudi Central Board of Accreditation for Healthcare Institutions; **ISMP:** Institution of Safe Medication Practice; **MOH:** Ministry of Health; **KSA:** Kingdom of Saudi Arabia; **GAPC:** General administration of pharmaceutical care; **USA:** United States of America.

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