

Original Research

Exploring pharmacists attitudes, practices, and barriers to conducting medication reviews in community pharmacy settings

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Abstract

Background: Medication review (MR) services are essential in optimizing therapy outcomes. In addition to the barriers hindering its adoption, understanding community pharmacists' perception and practice of MR is crucial in formulating strategies to enhance MR services in pharmacy practice. **Objective:** To evaluate pharmacists' attitudes, practices, and barriers to providing MR services in the community pharmacy setting. **Methods:** In this cross-sectional study, a validated self-administered questionnaire was distributed online to community pharmacists across the UAE using convenience-sampling technique. The questionnaire evaluated whether the pharmacists practiced MR, attitudes toward MR, the extent of its implementation, and the associated barriers. Stepwise regression was conducted to explore the variables associated with attitudes and MR practice. **Results:** The majority of the pharmacists (72.5%) reported providing MR, with a notable decline in engagement among older pharmacists (OR = 0.243, 95%CI (0.113-0.522), employee pharmacists (OR = 0.909, 95% CI (0.844-0.979) and those with no access to patient medication records (OR = 0.131, 95%CI (0.052-0.327)). The median attitude score was 27 out of 35, indicating favorable perceptions, particularly among pharmacists in chain pharmacies (OR = 2.974, 95%CI (1.245-7.103)). Employee pharmacists showed decreased odds of being in the high-attitude group (OR = 0.233, 95%CI (0.076-0.714) and decreased odds to practice MR (OR = 0.192, 95%CI (0.051-0.723) compared to pharmacists in charge or owner pharmacists. On the other hand, an increased number of working pharmacists (OR = 2.053, 95%CI (1.381-3.052) and improved attitudes increased the odds to practice MR in the community pharmacy (OR = 2.617, 95%CI (1.159-5.906)). **Conclusions:** The study revealed a room for improvement in MR practice, especially among older and employee pharmacists. Enhancing the accessibility to specialized databases and authorized references, and enforcing pharmacists' attitudes towards MR practice via providing education and facilitating inter-professional collaboration are essential strategies to improve MR practice in the community pharmacy setting.

Keywords: Pharmacist; medication review, practice, attitude, community pharmacy

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INTRODUCTION

Over the past few decades, community pharmacists' roles have expanded from the traditional dispensing of medication to a more patient-centred approach^{1,2}. The patient-centred responsibilities of community pharmacies prioritize achieving the best possible therapeutic outcomes for patients and



preventing health issues that could arise from medication misuse³, a purpose that could be achieved by implementing various health services including medication review (MR). According to the guidelines of the National Institute for Health and Care Excellence (NICE), MR is “a structured, critical examination of a person’s medicines with the objective of reaching an agreement with the person about treatment, optimizing the impact of medicines, minimizing the number of medication-related problems, and reducing waste”⁴.

Community pharmacists are increasingly known as dependable and approachable healthcare professionals as the demand for pharmaceutical care rises⁵. Community pharmacists in the UAE are increasingly recognized as integral healthcare professionals and are experiencing a significant transformation⁶. This shift demands pharmacists enhance their services and elevate their intellectual and interpersonal skills to meet increasing expectations, aligning with global trends in the profession⁷. Despite the significant progress made recently, the UAE faces particular challenges in its healthcare system, such as inequality in healthcare access, the disparity in health care development between the emirates, and the absence of uniform guidelines and policies throughout the country^{8–10}. Previous research has reported significant improvements in clinical outcomes and a reduction in treatment-related problems following the application of MR in the community pharmacy setting^{11–15}. However, despite its widespread adoption and global research attention^{16,17}, realizing the full benefits of this service necessitates an understanding of the perspectives and practices of community pharmacists regarding MR, as their engagement is central to reaping the benefits of MR services.

In addition, unravelling these barriers is crucial to fostering the effective integration of MR services in the community pharmacy landscape. The insights gained from the current study, while focused on the UAE, have broader relevance for other countries facing similar challenges in the implementation of MR services. This study thus contributes to the global understanding of factors influencing pharmacist behavior in community pharmacy settings.

Aims of the study

This study aimed (1) to assess community pharmacists’ attitudes and practices towards MR services, as well as the barriers that impede their adoption in the UAE, and (2) to explore the factors associated with pharmacists’ attitudes towards medication review. The insights gained from this study will prove invaluable in informing future strategies geared towards enhancing medication effectiveness, safety, and health outcomes.

MATERIALS AND METHODS

Study design and participants

In this cross-sectional study, a validated survey was distributed to pharmacists employed in community pharmacies across the UAE via social media platforms like Facebook, WhatsApp, and Twitter in the period from October 2023 through January 2024.

Pharmacists who had graduated from a university accredited by the Ministry of Higher Education and had a license to practice as pharmacists in the UAE were included in the study. The survey started with an introduction outlining the aims of the study and emphasizing the voluntary nature of participation and anonymity of the participants. All participants were required to provide their consent in the form before proceeding to the questionnaire section. The survey would end for those who did not agree to participate in the study.

Study instruments

The study survey was developed after a review of the relevant literature^{18–21}. Work-related and sociodemographic data were collected in the first section. Following the provision of the definition of medication review, the participants were asked about their familiarity with the term “medication review” and if they had ever implemented this service in a community pharmacy. Only those who indicated that they practiced MR completed the study questionnaire.

Pharmacists’ attitudes toward were assessed through six items on a 5-point Likert scale

ranging from strongly disagree (1 point) to strongly agree (5 points), with a maximum possible score of 30. Scores below the median attitude score were labeled as “low,” while scores above the median were labeled as “high. The frequency of practicing various aspects of MR (18 items) was assessed on a scale ranging from ‘always’ to ‘never’. In the final section of the questionnaire, pharmacists were requested to select the barriers to providing MR service from the listed potential barriers. Cronbach’s alpha of 0.83 for the attitude scale and 0.74 for the MR practice scale demonstrated the reliability of the study questionnaire. A panel of experts, including three professors in clinical pharmacy and practice and three clinical pharmacists, assessed the content validity of the questionnaire. Ten community pharmacists participated in a pilot study to ensure the relevancy, clarity, and comprehensiveness of the questionnaire. The final data analysis did not include any of the data from the pilot study.

Statistical analysis

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS, version 28, Illinois, New York, USA). Q-Q plots and the Kolmogorov-Smirnov test revealed that the continuous variables were not normally distributed. Categorical variables were presented as frequencies and percentages, while continuous variables were presented as medians with a 95% confidence interval (CI). Two multivariate stepwise logistic regression analysis were conducted to explore the variables associated with attitudes and MR practice. The attitude was dichotomized to low (below the median score) and high (above the median score), while the practice was dichotomized to practicing (yes) or not practicing MR (no). Significance was determined at a p-value < 0.05.

Ethics approval statement

The current research received ethical approval from the research ethics committee at Al Ain University- Abu-Dhabi



Campus in October 2023 (Ref. No. COP/AREC/AD/12). Informed consent to participate in the research was obtained from all study participants.

RESULTS

In total, 211 pharmacists (62.1% female) participated in the study. The median age was 31 (range 31-35) years. Most participants (89.1%) held a bachelor's degree in pharmacy, while only 6.2% had a doctorate in pharmacy (Pharm D) degree, and 4.7% completed a postgraduate (Master's or PhD) degree. The median of years of experience was five (CI: 5-6), and the median number of pharmacist coworkers was four

(CI: 4-5). Out of 211 participants, 90% were familiar with the term MR; however, only 72.5% of them reported practicing MR in the community pharmacy setting. Special populations (e.g., elderly, pediatric/infants, or pregnant individuals) and patient symptoms were the highest reported factors to be considered when prioritizing patients for medication reviews (Table 1). Regression analysis showed that increased age was associated with a lower likelihood of practicing MR (OR = 0.909, 95% CI (0.844-0.979), $p = 0.011$). Employee pharmacists had fewer odds of practicing MR compared to pharmacists in charge / owner pharmacists (OR = 0.131, 95%CI (0.052-0.327), $p < 0.001$). Additionally, the absence of patient medication records in the community pharmacy setting was associated

Table 1: Sociodemographic characteristics of the study participants (n=211)

		Median (95%CI) or Frequency (%)
Age		32 (31-35)
Gender	Female	131 (62.1%)
	Male	80 (37.9%)
Education	B Pharm (Bachelor in pharmacy)	188 (89.1%)
	Pharm D (Doctor in pharmacy)	13 (6.2%)
	Graduate (Master's or Ph.D.)	10 (4.7%)
Pharmacy Type	Chain community pharmacy	145 (68.7%)
	Independent community pharmacy	66 (31.3%)
Job Title	Employee pharmacist	65 (30.8%)
	Pharmacist in charge/ Owner pharmacist	146 (69.2%)
Average number of prescriptions dispensed per day	≤29	56 (26.5%)
	>29	155 (73.5%)
Average time spent with each patient	<5 minutes	57 (27%)
	≥5 minutes	154 (73%)
Years of experience		5 (5-6)
Weekly working hours		48 (48-52)
Number of pharmacists coworkers		4 (4-5)
Is there a counseling area in this community pharmacy?	Yes	193 (91.5%)
	No	18 (8.5%)
Do you have a patient medication record in the community pharmacy setting?	Yes	126 (59.7%)
	No	85 (40.3%)
Are you aware (familiar) with the term 'medication review' (MR)?	No	21 (10%)
	Yes	190 (90%)
Do you practice the MR in the community pharmacy setting?	No	58 (27.5%)
	Yes	153 (72.5%)
Which of the following factors do you consider when you prioritize the patients for a medication review?	Referral from physician	83 (39.3)
	Referral from other pharmacists	107 (50.7%)
	Patient symptoms	121 (57.3%)
	Presence of comorbid disease	98 (46.4%)
	Number of prescribed medications	115 (54.5%)
	Presence of side effects and other safety problems	101 (47.9%)
	Duration of treatment	115 (54.5%)
	Special population (e.g., elderly, pediatric/infants, or pregnant)	143 (67.8%)

with a lower likelihood of practicing MR (OR = 0.243, 95%CI (0.113-0.522), $p < 0.001$).

Table 2 displays the attitudes of participants who reported practicing MR in a community pharmacy setting. The median attitude score was 27 (CI: 27-28) out of a maximum possible score of 35, indicating favorable perceptions. Regression analysis showed that working in chain community pharmacies was associated with increased odds of being in the high-attitude group compared to working in independent community pharmacies (OR = 2.974, 95%CI (1.245-7.103), $p = 0.014$). On the other hand, employee pharmacists showed decreased odds of being in the high-attitude group compared to pharmacists in charge / owner pharmacists (OR = 0.233, 95%CI (0.076-0.714), $p = 0.011$).

Table 3 provides insights on MR practice. The most common MR-related practice was the assessment of whether the prescribed medication was the most effective for the patient's condition (88.9%). In contrast, the least frequently reported practice was documenting the patient profile (79.8%). Regression analysis showed that employee pharmacists exhibited decreased odds to practice MR compared to pharmacists in charge / owner pharmacists (OR = 0.192, 95%CI (0.051-0.723), $p = 0.015$). However, increased number of working pharmacists (OR = 2.053, 95%CI (1.381-3.052), $p < 0.001$) and improved attitudes increased the odds to practice MR (OR = 2.617, 95%CI (1.159-5.906), $p = 0.021$).

As shown in Table 4, the most frequently reported barrier to MR was a lack of approved references (72%), followed by a lack of cooperation with other health care professionals (71.1%). The least reported barriers were poor communication skills (25.6%) and a lack of knowledge (26.1%).

DISCUSSION

Implementing medication review (MR) services in community pharmacies can significantly enhance drug effectiveness and patient safety by addressing medication-related issues. Addressing community pharmacists' perspectives, practices, and barriers regarding MR implementation is essential for developing strategies to integrate MR services into pharmacy practice. This study aimed to evaluate community pharmacists' attitudes, practices, and barriers to providing MR services in the community pharmacy setting.

The insights gained from the current study, while focused on the UAE, have broader relevance for other countries facing similar challenges in the implementation of MR services. This study thus contributes to the global understanding of factors influencing pharmacist behaviour in community pharmacy settings. While many pharmacists practiced MR, which is consistent with earlier research findings^{22,23}, a significant proportion of pharmacists did not provide MR service in the community pharmacy setting in the present study. Specifically, only 79.8% of them reported documenting patient information, highlighting the need for a greater emphasis on encouraging and improving the documentation practice of community pharmacists. Results revealed several factors that were associated with a reduced likelihood to practice MR in the community pharmacy setting. Age emerged as a significant factor, with older pharmacists being less likely to practice MR. This association may be explained by differences in the educational and training backgrounds of these pharmacists, who may have prioritized the traditional role of pharmacists in medication dispensing instead of expanding their knowledge to include newer services such as the MR²⁴. Moreover, employee pharmacists were less likely to engage in MR practice than pharmacists in charge or pharmacy owners, which may be

Table 2: Attitudes toward the medication review process					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Besides the processes of normal dispensing functions, reviewing patients' medication profiles and providing interventions are essential as pharmacist roles to maximize drug effectiveness and patient safety.	2 (1.3%)	2 (1.3%)	10 (6.5%)	11 (7.2%)	128 (83.7%)
Providing MR services is a unique opportunity for pharmacists to participate in patient care at a broader spectrum.	1 (0.7%)	5 (3.3%)	10 (6.5%)	94 (61.4%)	43 (28.1%)
Applying MR services requires more knowledge than basic information of pharmacy practice.	1 (0.7%)	2 (1.3%)	16 (10.5%)	39 (25.5%)	95 (62.1%)
Patients would receive adequate and beneficial information about their chronic diseases and medication therapies from their providers through MR services.	1 (0.7%)	7 (4.6%)	12 (7.8%)	72 (47.1%)	61 (39.9%)
MR will enhance the partnership between the patient and the prescriber and hence patient adherence to medication therapy.	4 (2.6%)	3 (2%)	10 (6.5%)	56 (36.6%)	80 (52.3%)
A patient's health outcomes would be improved when a pharmacist monitors medications compared to other healthcare providers.	4 (2.6%)	2 (1.3%)	14 (9.2%)	65 (42.5%)	68 (44.4%)



Table 3: Frequency of practicing medication review					
	Never	Rarely	Sometimes	Often	Always
	N (%)	N (%)	N (%)	N (%)	N (%)
Collect medication-related information from the patients or their caregivers.	4 (2.6%)	4 (2.6%)	17 (11.1%)	7 (4.6%)	121(79.1%)
Collect medication-related information from other healthcare providers.	0 (0%)	9 (5.9%)	16 (10.5%)	85 (55.6%)	43 (28.1%)
Assess whether the prescribed medication is the most effective for the patient's condition.	0 (0%)	2 (1.3%)	15 (9.8%)	41 (26.8%)	95(62.1%)
Assess whether the medication are prescribed according to the most updated treatment guidelines.	1 (0.7%)	4 (2.6%)	15 (9.8%)	68 (44.4%)	65 (42.5%)
Assess whether the prescribed medications may cause health problems depending on the patient's condition.	2 (1.3%)	3 (2%)	18 (11.8%)	48 (31.4%)	82 (53.6%)
Assess the potential to develop adverse drug effects.	0 (0%)	4 (2.6%)	17 (11.1%)	46 (30.1%)	86 (56.2%)
Assess the risk of developing a drug allergy.	0 (0%)	5 (3.3%)	13 (8.5%)	52 (34%)	83 (54.2%)
Assess the potential for drug-drug interaction.	0 (0%)	8 (5.2%)	9 (5.9%)	44 (28.8%)	92 (60.1%)
Assess the potential for drug-food interaction.	1 (0.7%)	5 (3.3%)	16 (10.5%)	50 (32.7%)	81 (52.9%)
Assess the dosage regimen of the prescribed medication.	3 (2%)	3 (2%)	16 (10.5%)	50 (32.7%)	81 (52.9%)
Adjust the dose based on kidney function or body weight.	3 (2%)	4 (2.6%)	20 (13.1%)	52 (34%)	74 (48.4%)
Check whether the patient has experienced any problems with their medication.	1 (0.7%)	6 (3.9%)	14 (9.2%)	54 (35.3%)	78 (51%)
Check whether the patient has any concerns about their medication.	0 (0%)	7 (4.6%)	15 (9.8%)	53 (34.6%)	78 (51%)
Develop a follow-up plan with the patient.	1 (0.7%)	9 (5.9%)	15 (9.8%)	46 (30.1%)	82 (53.6%)
Specify the monitoring parameters for medication effectiveness and safety.	1 (0.7%)	5 (3.3%)	19 (12.4%)	53 (34.6%)	75 (49%)
Document patient profile.	6 (3.9%)	5 (3.3%)	20 (13.1%)	46 (30.1%)	76 (49.7%)
Assess medication adherence.	1 (0.7%)	1 (0.7%)	24 (15.7%)	42 (27.5%)	85 (55.6%)
Assess patient satisfaction with the prescribed medication.	4 (2.6%)	6 (3.9%)	14 (9.2%)	31 (20.3%)	98 (64.1%)

Table 4: Barriers to conduct a medication review	
	Frequency (%)
Lack of knowledge	55 (26.1)
Lack of training	73 (34.6)
Lack of approved references	152 (72)
Lack of time	116 (55)
High workload	126 (59.7)
Shortage of staff	78 (37)
Lack of a designated place in the pharmacy	118 (55.9)
Lack of specialized databases	136 (64.5)
Having poor communication skills	54 (25.6)
Lack of patient cooperation	141 (66.8)
Lack of other healthcare professionals' cooperation	150 (71.1)

explained by the fact that working as employee pharmacists may limit individuals' capacity to allocate sufficient time to perform MR activities. In addition, pharmacy owners tend to be more concerned about the success and advancement of their pharmacies, which may motivate them to implement new services such as MR. The absence of patient medication records in community pharmacies, was another factor for not practicing MR in the present study. Pharmacists' ability to perform a thorough MR will be hampered by the lack of

complete and current patient information, as these records are necessary for doing so²⁵. These findings highlight the importance of increasing the availability of patient medication records in community pharmacies, as well as emphasizing the importance of MR practices, specifically targeting older pharmacists and employee pharmacists, with the goal of improving medication safety and health outcomes.

Pharmacists in the current study displayed positive attitudes towards MR. Earlier studies reported positive attitudes among



pharmacists toward medication therapy management, which is a pharmacist-led service that includes medication review^{22,26–28}. In this study, pharmacists who were working in chain community pharmacies had significantly more positive attitudes towards MR than those working in independent pharmacies. According to a Chinese study, pharmacists employed in chain pharmacies demonstrated superior knowledge and more positive attitudes regarding pharmaceutical care, as well as offering more advanced services, when compared to pharmacists working in independent pharmacies²⁹. An evidence suggest that pharmacists in chain pharmacies are more skilled at providing extended pharmacy services than independent pharmacies^{30,31}, highlighting the need for further research to determine the factors associated with less favorable attitudes towards pharmaceutical service provision in independent pharmacies.

Employee pharmacists in the present study had significantly more negative attitudes and less likelihood to provide MR services compared to pharmacists in charge or owner pharmacists. In a Malaysian study, community pharmacists' attitudes and practices regarding the provision of weight management services were greatly influenced by their employment status, with pharmacy owners exhibiting more positive attitudes and practices than employees³². Pharmacy owners may have more control over how MR is implemented and provided in their practice, allowing them to offer more customized services to their patients³². On the other hand, having a higher number of coworker pharmacists significantly increased the likelihood to practice MR in the present study. This may be due to having more pharmacy employees, reducing individual workloads, and freeing up more time for MR services. Consistent with earlier research findings, having a positive attitude towards MR was significantly associated with increased likelihood to practice MR in the community pharmacy setting^{33,34}. These results imply that implementing effective training and education campaigns to improve pharmacists' attitudes towards MR and its' role in enhancing patient outcomes is deemed necessary to enhance MR practice in the community pharmacy.

The most frequently reported barriers to the provision of MR in the present study were the lack of approved references (72%), lack of cooperation with other healthcare professionals (71.1%) and patients (66.8%), and lack of specialized databases (64.5%). In a previous Jordanian study, only 22.7% of participating pharmacists believed that there were approved references available to provide MR services, and 22.8% reported that the treating physician accepted the results and outcomes of this service²¹. The study also found that merely 19.7% of the pharmacists stated that the patients agreed with the pharmacist's suggestion to perform the procedure, and only 30.7% received all the information required to complete the MR from patients. On the other hand, only half of the participants thought that performing MR required the availability of specialized databases²¹. Therefore, it is deemed necessary to ensure the availability of approved references and specialized databases in community pharmacies to facilitate the process of MR implementation. Encouraging patients and HCPs to collaborate with pharmacists to enhance MR implementation and ensure optimal prescribed drug therapy

provision of MR services.

Limitations

The current study has some limitations. The use of a convenience and snowball sampling may introduce selection bias, potentially impacting the generalizability. The cross-sectional study design does not establish a cause-effect relationship. Moreover, the reliance on self-reported survey data could render the study vulnerable to social-desirability bias, as participants may provide responses that they believe are socially acceptable rather than reflecting their true attitudes and behaviors. Lastly, pharmacists who did not practice MR were excluded from the study, which might caused loss of the opportunity to identify barriers among pharmacists who do not provide MR.

CONCLUSIONS

The current study demonstrated positive attitudes and good practices regarding MR among community pharmacists in the UAE, with several identified barriers. Therefore, forthcoming pharmaceutical care protocols should develop effective strategies to increase the availability of approved references and specialized databases in community pharmacies to enhance the implementation of MR services, as well as increase patients' and healthcare professionals' awareness of the importance of these services for enhancing patient outcomes.

AUTHORS' CONTRIBUTION

ASJ conceived and designed the study, supervised the project, conducted research, provided research materials, and wrote initial and final draft of article. WA validated instruments, organized, analysed and interpreted data and reviewed the manuscript. KHA designed the study, collected, organized, analysed and interpreted data, and wrote final draft of article. SRA designed the study, collected, organized, analyzed and interpreted data, and wrote initial draft of article. AA designed the study, collected, organized, analysed and interpreted data, and wrote initial and final draft of article. TM validated instruments, organized, analysed and interpreted data and reviewed the manuscript. YNA conceived the study co-supervised the study and reviewed the final draft of the manuscript. SA conceived the study and research methods, co- reviewed the final draft of article, and provided logistic support. AA conceived the study and research methods, validated instruments, organized, analysed and interpreted data and reviewed the manuscript. EA conceived the study co-supervised the study, reviewed the final draft of the manuscript and provided logistic support. All authors have critically reviewed and approved the final draft of the study and agreed to be accountable for all aspects of the work.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest to declare.



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