

# Medication therapy management application and pharmacist readability to provide the service in Saudi Arabia

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## ABSTRACT

**Introduction:** Medication Therapy Management (MTM) is a service of comprehensive medication review (CMR) primarily provided by pharmacists. **Objectives:** Assess pharmacists as MTM services provider including (I) pharmacists' readiness, and capability, and (II) the barrier from implementing the service effectively. Then this paper aims to service the pharmacy profession to be more patient-centered oriented. **Methodology:** A cross-sectional study, all Saudi resident pharmacists were eligible. Data analysis using SPSS, a descriptive analysis, frequencies used. Qualified and professional candidates were chosen for data entry. **Result:** A total of 707 pharmacists were included. It has been concluded that any pharmacy profession eligible to provide MTM services from the varied responses of 37.4%, with only clinical pharmacists, 35.4%, with any pharmacists, and 27.1%, with experienced pharmacists. The most MTM potential categories were in the following order: polypharmacy, patients with 2 chronic diseases or more, uncontrolled condition then, patients with poor adherence. The most pointed out barriers from MTM implementation were workload, patients have no interest, and time consuming. The estimated average time per patient per minute for MTM provision was  $3.11 \pm 1.37$  SD. The merited compensation per patient per minute in Saudi Riyal (SR), (1USD=3.75SR) for MTM provision. 28% responding pharmacists believed in offering the MTM service for free. 96%, responding pharmacists stated enjoying providing the service. **Conclusion:** Considering the most MTM potential patients mentioned, the highlighted barriers to be eliminated, and providing the suitable duration and pharmacists' compensation will guarantee the future benefit from MTM service implementation in Saudi Arabia.

**Keywords:** Medication therapy management application, pharmacist readability, service in Saudi Arabia

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## INTRODUCTION

Modern pharmacy practice has been broadened from distributing, dispensing medication to become involved in a clinical patient-oriented practice where the pharmacist used to provide medication therapy and disease management<sup>1</sup>. MTM defined as a cooperative services between patient and pharmacist to provide a CMR to reach optimizing therapeutic outcomes, ensuring an individual's medications are safe and effective<sup>2</sup>. Besides, it can be in the conjugation of drug product dispensing<sup>3</sup>. During CMR, personal medication record been looked through which including (prescription and non-prescription medications, dietary supplements, herbal products, medication allergies, and patient's immunization status)<sup>4</sup>, to enable the pharmacist to recognize existing or prevent potential drug-related problem (DRPs), spot duplication in therapy, finalizing the service with documentation of all the interventions<sup>5</sup>. DRPs can be done in a way of an initiate, modify, or discontinuing drug therapy<sup>6</sup>. In addition, monitoring and arranging follow-ups needed. In order to meet the goals of (I) optimizing patient's medications use,

providing them with education and counseling needed (II) minimizing the risk of adverse drug reaction and detecting improper medication prescription (III) maximizing their adherence to their medication<sup>3</sup>; all of which are contributing not only to better therapeutic outcome but also to lower medical costs<sup>7</sup>. There is no consensus way of delivering the MTM services, face-to-face (community-, clinic- or home-based) or even through a telephone consultation<sup>8</sup>.

A study had revealed 37.5% of type II diabetic had high adherence at the baseline was noticeably increased to 59.5% after MTM program intervention; moreover, 35.5% of low adherence patients decreased to 15.3%<sup>9</sup>. Most recently, a study in the western region of Saudi Arabia on MTM program was perceived as valuable for the patient's care by 96% of the respondents. Furthermore, 72.4% of the respondents were thought that pharmacists were eligible to provide MTM services<sup>10</sup>. More studies and confirmed indeed that pharmacist as MTM provider has shown a positive impact on chronic diseases outcomes<sup>11</sup>. Another study from Saudi Arabia had shown more than 70% of the

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patients admitted to the emergency department having DRPs along with noncompliance, were possibly preventable<sup>12</sup>. Another study of diabetic compliance conducted in Saudi Arabia, 67.9% of the participant were non-compliance with their therapy<sup>13</sup>. And yet, there is no effective application of the MTM service in our hospital or community pharmacy here in Saudi Arabia.

### OBJECTIVES

First, this paper aims to assess pharmacist's readiness, and capability to provide the MTM service and to highlight the barrier from implementing the service effectively. Also, align with modern practice, patientcentered care, it aims to be a contributor in expanding the pharmacy profession in Saudi Arabia.

### METHODOLOGY

**Study Design:** A descriptive cross-sectional study takes place in Saudi Arabia. From previous studies, 500 pharmacists were used to estimate a good description of MTM services. A questionnaire will be distributed through a self-reported questionnaire; through the link online and others will be by face-to-face interview, a verbal explanation of the study aim was given. Informed statement to the questionnaire respondents that the participation is voluntary. No personal information will be published and falling the questionnaire will be considered as a consent form.

**Inclusion & Exclusion Criteria:** All Saudi resident pharmacists are eligible to participate including New graduate, Clinical-, Academic-, Company-, Hospital-, and Community-, Pharmacists. Any hospital-based or community-based or other pharmacy professions that don't meet the criteria were excluded.

**Questionnaire:** A simple questionnaire had been developed with 7 questions questionnaire, which might take 2-3 minutes to be completed. MTM definition was attached to ensure that respondents understanding the pharmacist's service. Educational degree or proficiency was the only part of the demographic section. Pharmacists were asked about their opinion about the best MTM provider within the pharmacy field and the potential patients to receive the service, their thoughts about being MTM provider, as well as if they will enjoy providing it. They were also asked about the time ranged to provide this service and the possible barrier to provide MTM services. Lastly, how much money in SR per minute per patient they are willing to have as compensation to provide this service.

**Data collection:** A template for the data collection sheet was structured using Excel to give detailed descriptions of the MTM services. Qualified and professional candidates were chosen for data entry to present the quality and accuracy of data; aiming to provide comprehensive information about MTM services. **Data Analysis:** Statistical analysis for the main variables of the study will be shown after using SPSS. A descriptive analysis, frequencies, will be used whenever suitable.

### RESULT

A total of 707 pharmacists were included in this study, where most of them were newly graduates with (45%, n=315). The second highest respondents were pharmacists of hospital private sectors with (17.7%, n=124); then the pharmacists serving outpatient with (15.7%, n=110) compared with the responding pharmacists serving

inpatient with (3%, n=21). The least respondent pharmacists were pharmacists from community pharmacies with (1.7%, n= 12); more descriptions for the participants of this study were shown in (table1).

The pharmacist's respondents had varied in their responses regarding the best MTM provider. It is considered that (37.4%, n=262) as only clinical pharmacists had the eligibility to provide MTM services, (35.4%, n=248) considered that any pharmacists could provide MTM services, and the rest (27.1%, n=200) thought that only experienced pharmacists were eligible to provide MTM services.

The respondent's pharmacists that answered the questionnaire showed that the most potential patients that getting benefit from MTM services shown in the (figure1) were those patients with polypharmacy who known to take 5 or more appropriate medications<sup>14</sup> and those patients with 2 chronic diseases or more with (75%, n=525) and (74.4%, n=521) respectively. The next potential patients were uncontrolled condition with (54.6%, n=382) then patients with poor adherence with (52%, n=364) respondents, then (42.1%, n=295) respond that depend on medication and (30.7%, n=215) illiterates or poor patients. Only a few pharmacist respondents had shown that all patients need MTM services, others were restricted MTM services to geriatrics and the last group of respondents were answered that MTM services should cover those patients who were using medical equipment and patients receiving medications with the potential of drug-drug interaction or drug-food interaction.

Implementing MTM services in Saudi Arabia confronted with specific barriers displayed in (Figure2), were (96.4%, n=483) of the respondent pharmacists responding that the workload was the main barrier. Another barrier that pharmacists assumed that "the patients are not interested" to receive MTM services with (63.6%, n=442) of the respondent pharmacists. Time consuming, is another barrier could influence MTM services negatively with (46.9%, n=325) of the respondent pharmacists. Other barriers such as finance, lack of knowledge, shortage of staff had also affected negatively to perform MTM services. From (table1) the suitable duration to provide MTM services ranging from five minutes or less up to 60 minutes per patient. The estimated time to provide MTM services in accordance with pharmacist's respondents with an average of  $3.11 \pm 1.37$  SD. Most of the pharmacists with specialty such as ambulatory care, Inpatient and outpatient, community, clinical-masterresident pharmacists including pharmacists from private sector had responded that 30 minutes or less is the most preferable duration to provide MTM services, which gives (30%, n=210) of the respondents' pharmacists were agreed with 30 minutes or less as enough duration to provide MTM services. Other responding pharmacists with (24%, n=165) agreed that 10 minutes or less was the suitable duration to provide MTM services, and (19%, n=135) of the responding pharmacists suggested that 15 minutes or less as acceptable duration to provide MTM provision. Other respondents did not give a specific time and mentioned that it depends on the patient's case. Responding pharmacists were requested to estimate the merited compensation per patient per minute in SR, (1USD=3.75SR) for MTM provision shown in (table2). This study resulted in an average of ( $2.38 \pm 1.68$  SD) SR and with a percentage of (35%, n=246) of the responses in favor of (1-10) SR per minute to be the compensation. The next

highest percentage is (28%, n=199) responding pharmacists believed in offering the MTM service for free. On the other end of the spectrum, (19%, n=136) of the pharmacist's respondents prefer (50 SR per minute or more) as a suitable compensation. Fortunately, more than (96%, n=673) responding pharmacists, responded positively toward enjoying while they are providing MTM services.

## DISCUSSION

More than seven hundred pharmacists were responded to the questionnaire with multi-professional pharmacists included in this study. The responses from newly graduate pharmacists were dominated by 45%, while the others were less from the private sector 17.7%, and outpatient pharmacists 15.7%. This response from newly graduate could be due to that the younger healthcare providers were utilizing social media much more than older<sup>15</sup>. Moreover, the new graduates were willing to know about MTM services compared with older pharmacists<sup>16</sup>. Although, the new graduates have most of the responses, yet it had no impact or pronounce different compared with the pharmacist of the private sector and outpatient pharmacists. On the other hand, inpatient pharmacists showed significantly minor responses for MTM services questioner.

To our knowledge, there is no consensus on the best pharmacist profession to provide MTM services, however, previous studies showed that any pharmacy profession could provide MTM services including community pharmacists<sup>10</sup>, clinical pharmacists<sup>17</sup>; and also extended to the new graduate or resident pharmacists could provide MTM services and identifying DRPs<sup>18</sup>. This study declared that there are minor variance percentages of the best MTM provider among pharmacist's professionalism where 37.4% of pharmacist's respondents with the clinical pharmacists as the best MTM provider, 27.1% and 35.4% were experienced pharmacists and any pharmacist respectively; giving a conclusion that any pharmacist is able to provide MTM services.

Recognizing those who were in need to get benefit from MTM services might be hard. According to American Pharmacists Association (APhA) and National Association of Chain Drug Stores (NACDS) "Patients with a potential need for MTM services can be identified by the pharmacist, physician, or other health care professionals; the health plan; or patients themselves when medication-related problems are suspected"<sup>19</sup>. To warrant service provision to all patients in need, clear specifications for MTM potential patients are required. A question was arising to the respondent pharmacists classify the potential patients to provide them with MTM services? The answers were polypharmacy and patient with two chronic diseases are the most two patient categories that need to get benefit from MTM services with 75% and 74.4% respectively. High health care costs, adverse drug events, drug interactions, and nonadherence were found to be a polypharmacy consequences<sup>20</sup>. Moreover, polypharmacy had been linked with undesirable clinical outcomes in geriatric patients<sup>21</sup>, therefore, they need to have MTM services. Chronic disease requiring long-term therapy and management with medication(s) and many of them found to be nonadherence to their medication(s)<sup>22</sup>. Further MTM services provided to patients with multiple chronic conditions had been appreciated<sup>23</sup>. The next categories were patients with an

uncontrolled condition(s) who need to have MTM services and patients with poor adherence to their medication(s) with 54.6%, and 52% respectively. A study mentioned that it is common to refer patients with an uncontrolled condition(s) to pharmacists for MTM provision because of their need for intensive services<sup>24,25</sup>. Disease deterioration, increased mortality, along with the financial burden owing to poor adherence<sup>26</sup>. A confirmed relationship between pharmacist provides MTM services and improvement in patient adherence<sup>27,28</sup>. Compared to the previous four categories the following were less potentials. More than 42% pharmacists categorized patients as MTM potential dependent on their medication which might be because of their potential abuse or for medication cost considerations<sup>19</sup>, and 30.7% pharmacists stated that low health literacy or poor patients as MTM potentials. Health literacy is the degree of individuals' capability to acquire health information and their ability to make health decisions<sup>29</sup>. One of the risk factors for low health literacy was low income projecting those patients to poorer health<sup>30</sup>. Besides, in the processes of MTM provision patient level of literacy been evaluated and medication cost been a concern<sup>19</sup>, therefore, the MTM benefit could be warranted to this category of patients. Geriatric usual accompanied with caregivers or perhaps they are categorized with any of the above categories. Pharmacists who categories all patients as a potential maybe not aware of the difference of MTM services and patient counseling, also it is not practical to provide MTM services to all patients considering the barriers will be mention elsewhere and since most of the patients need can be fulfilled with considering service. The broad scope of MTM services gives an opportunity to pharmacists' services to be an essential part of many patients' care.

According to the results of this study, the most possible barrier that influenced the provision of MTM services were pharmacist workload with 96.4%. The workload is the amount of work performed by an individual pharmacist within a limited time frame<sup>31</sup>. The other barrier was time-consuming for 46.9% of the responding pharmacists, in order for MTM and other cognitive services to be implemented pharmacists should be free of the non-specialized or administrative task(s) which occupied considerable time of pharmacists workday<sup>32,33</sup>. A study mentioned that these two barriers to be the most top barrier from MTM services implementation, in addition to staff shortage<sup>34</sup> that could be overcome with the utilization of pharmacy technicians to assist in scheduling, billing, patient calls, and documentation<sup>34,33</sup>. Regarding, patients not interested pharmacists stated 63.6% of the respondents. This pharmacists' assumption most likely from their typical patient dispensing, and counseling that usually comes after other practitioners' visits, and long hours of waiting. Unlike MTM services in which providing the service could be in separate day and in a private or semi-private area<sup>19</sup>. Results from this study respondent pharmacists mentioned that pharmacists level of knowledge about MTM services provision, and the lack of training as the barrier were it was the case in many other study<sup>2</sup>. And the pharmacists' compensation could be one of the barriers<sup>32</sup>.

The promising results of 96% responding pharmacists were enjoying while they providing MTM services, which align in parallel with time "30 min per patient" as the suitable duration for MTM services provision<sup>17,35</sup>



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consistent with this study with 30% of pharmacists' responses. The time "30 minutes" used to provide the five core elements of MTM concluded with (I) medication therapy review, (II) personal medication record, (III) medication-related action plan, (IV) intervention and/or referral, and (V) documentation and follow-up<sup>33</sup>. Financial incentives found to be motivation for pharmacists to provide MTM services<sup>36</sup> (1-10) SR were adequate compensation for the majority of this study respondent pharmacists. Surprisingly, 28% of the responding pharmacists were agreed to provide the MTM services free of charge. This could be proposed by the typical practice in Saudi Arabia of receiving no compensation for pharmacists' services<sup>10</sup>. More information found in the table 1,2.

### CONCLUSION

Adding the proven benefit of MTM services that account for both patients' medication cost, safety and efficacy and pharmacy profession mentioned earlier and the positive pharmacists' responses toward MTM provision should encourage the future implementation of MTM services in Saudi Arabia. The study concludes that any pharmacist's professionalism eligible to provide MTM services that targeting but not limited to patients with (I) polypharmacy, (II) two chronic diseases or more, (III) uncontrolled condition(s), and (IV) poor adherence. Warranting pharmacy technicians utilization and pharmacist alienation from non-specialized tasks to overcome the most MTM services barriers which are workload and time constraints and establishing private or semi-private areas with scheduling MTM services according to patient' preference to avoid the barrier of patient not interested. More, training program implementation to increase pharmacist's actual readiness in terms of practicality and the required knowledge to confidently perform MTM services effectively. In addition, although MTM services provision free of charge was mentioned financial incentive of (1-10) SR per minute per patient will be appreciated to align "30 min per patient" for five core elements of MTM to be provided.

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Pharmacist's professionalism	0 - 5	>5 -10	>10-15	>15 -30	≤ 60	Depend on case	Total respondents of
New graduate pharmacists	37	74	63	90	42	9	315
Ambulatory pharmacists	9	9	7	15	5	0	45
Outpatient pharmacists	17	29	18	36	5	5	110
Private sector pharmacists	21	36	20	33	10	4	124
Community pharmacists	0	2	2	6	2	0	12
Clinical-Master-Resident	2	6	9	10	7	4	38
Inpatient pharmacists	2	3	3	9	2	2	21
Company-Authority- Ministry	2	6	13	11	3	0	35
<b>Total</b>	<b>90</b>	<b>165</b>	<b>135</b>	<b>210</b>	<b>76</b>	<b>24</b>	<b>700</b>
Percentage %	13%	24%	19%	30%	11%	3%	100%

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Outpatient pharmacists	38	35	10	6	21	110
Private sector pharmacists	39	39	15	5	26	124
Community pharmacists	6	5	1	0	0	12
Clinical-Master-Resident	5	22	1	2	8	38
Inpatient pharmacists	4	9	4	2	2	21
Company-Authority- Ministry	11	14	4	2	4	35
<b>Total</b>	<b>199</b>	<b>246</b>	<b>63</b>	<b>56</b>	<b>136</b>	<b>700</b>
Percentage %	<b>28%</b>	<b>35%</b>	<b>9%</b>	<b>8%</b>	<b>19%</b>	<b>100%</b>

Table 1. a crosstabulation of average time (minutes) that could be consumed to provide MTM services against pharmacist's professionalism description.

Pharmacist's professionalism	Free	1-10 SR	11-30 SR	31-50 SR	>50 SR	Total of respondents
New graduate pharmacists	86	106	23	35	65	315
Ambulatory pharmacists	10	16	5	4	10	45

Table 2. a crosstabulation of merited pharmacist's compensation in SR per minute to provide MTM services against the description of pharmacist's professionalism.

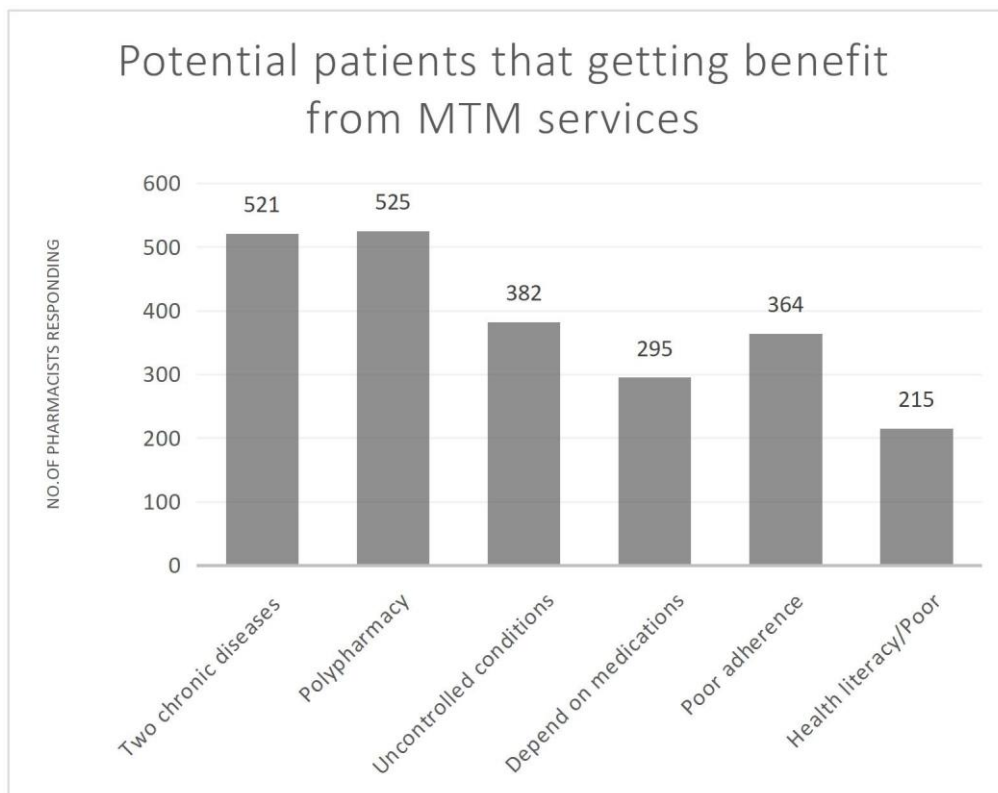


Figure1. A figure represented the potential patients to receive MTM services according to the pharmacist's respondents. Note: this question is flexible to respond with more than one answer.

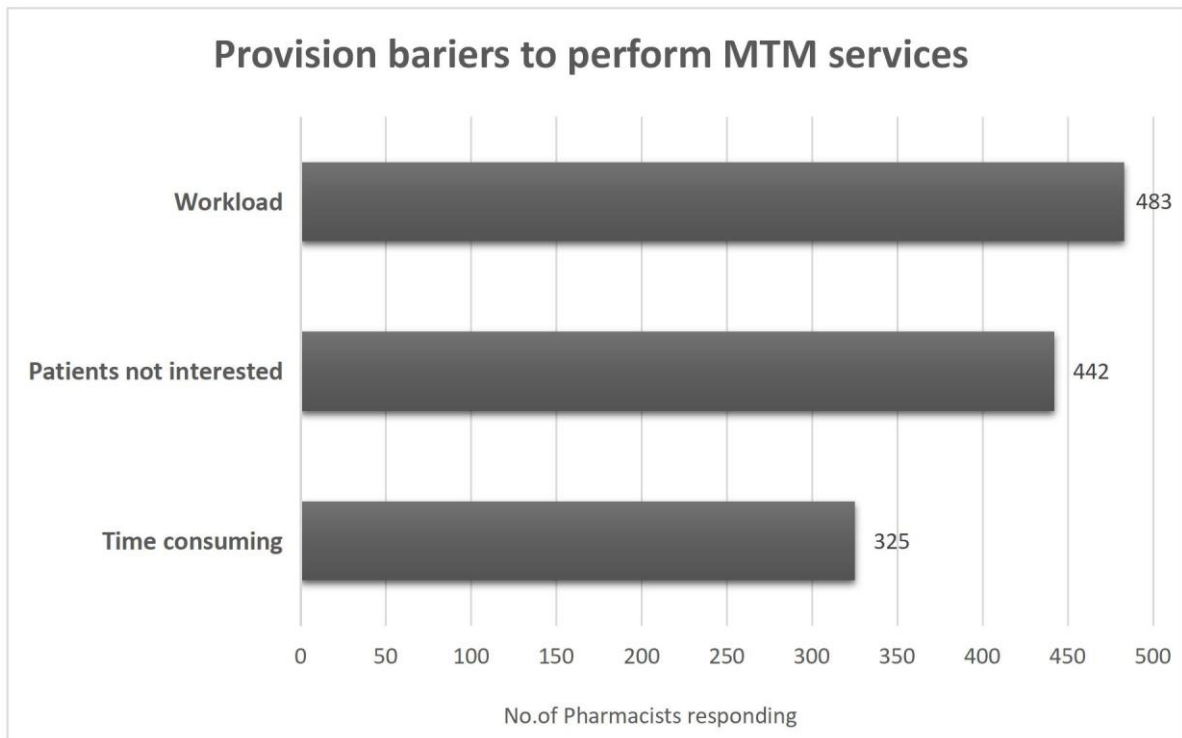


Figure2. The various barrier that affected negatively to perform MTM services.