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Review Article

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Medication Therapy Management Service: A Model to Practice Pharmaceutical Care

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ABSTRACT

The patient-centered, pharmacists' service model presented in this article is designed to manage patients' medications in diverse patient care settings. Originated in the USA and built upon the principles of "Pharmaceutical Care", Medication Therapy Management (MTM), is a distinct service or group of services that optimize therapeutic outcomes for individual patients through the assessment and evaluation of the patient and his or her medication therapy regimen. This service is designed to assess medication-related needs and identify and resolve medication-related problems. MTM maintains the original five core elements namely; medication therapy review (MTR), a personal medication record (PMR), a medication-related action plan (MAP), intervention and referral, and documentation and follow-up. MTM services have been shown to decrease medical costs, improve clinical outcomes and have significant impact on the appropriateness, effectiveness, safety, and compliance with medications. The purpose of writing this review is to introduce this new patient care practice to national pharmacists to assume responsibility as essential healthcare providers and try to use this practice model to help achieve the desired outcomes for their patients' pharmacotherapy.

Keywords- *Medication Management; Pharmaceutical Care; Patient-centered; Drug-related problems; Personal Medication Record; Medication-related Action Plan.*

INTRODUCTION

The number of prescription medications dispensed increased significantly all over the world and was reported to be increased more than 50% in the USA; in the period between 1996 and 2006.[1,2] As drug utilization has risen, so has the level of drug-related morbidity and mortality, associated with the use of these medications. Adverse drug events (ADR) in ambulatory patients cost the US health care system approximately $177.5 billion in the year 2000.[3-5]Improving medication use is an important public health goal that is acknowledged by the World Health Organization (WHO) to be part of all health care systems all over the world and is recognized in the United States national public health initiatives (Healthy People 2020).[6] Recognizing the Pharmacist's role as the medication therapy expert, the pharmacy profession in the USA (represented by eleven national pharmacy organizations) has developed a consensus definition for Medication Therapy Management (MTM) in July 2004 and this term is increasingly being used to describe the services provided by pharmacists to patients.[7]

Medication management services are the identifiable events in practice surrounding the professional responsibility of managing a patient's medication. Generally speaking, there are two different approaches being taken to medication management services; the prescription-focused approach and the patient-centered approach.[8] MTM services are distinct from medication dispensing and the routine patient counseling that a pharmacist provides when a patient picks up an individual prescription medication(s). These brief counseling sessions usually involve instructions for the medication(s) being dispensed, and address the patient's questions relating to those specific medications. MTM therefore, is the approach that focuses on a patient-centered process of care. It is a distinct service or group of services that optimize therapeutic outcomes for individual patients through the assessment and evaluation of the patient and his or her medication therapy regimen. MTM is designed to identify and resolve medication-related problems, and has shown to both reduce health care costs and improve clinical outcomes. These services are independent of, but can occur in conjunction with, the provision of a medication product.

MTM services are built upon the philosophy and the process of pharmaceutical care that was first implemented in pharmacy practice in the early 1990s. This concept laid the foundational elements of MTM services that could be provided by pharmacists across all pharmacy practice settings, whether it was community or clinical. Pharmaceutical care practice involves an interactive dialogue about the patient's medications and conditions, a thorough assessment of any problems identified, and development of interventions to reduce the risk of drug-related problems, disease, and disease progression. The process also involves the inclusion of documentation, follow-up, and interaction with other healthcare providers.[8,9-12]

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MTM encompasses a broad range of professional activities and responsibilities within the scope of pharmacy practice. According to the individual needs of the patient, these services include but are not limited to the following: a) Performing necessary assessments of the patient's health status; b) Formulating a medication treatment plan; c) Selecting, initiating, modifying, or administering medication therapy; d) Monitoring and evaluating the patient's response to therapy, including safety and effectiveness; e) Performing a comprehensive medication review to identify, resolve, and prevent drug-related problems (DRPs), including adverse drug events; f) Documenting the care delivered and communicating essential information to the patient's other primary care providers; g) Providing verbal education and training designed to enhance patient understanding and appropriate use of his/her medications; h) Providing information support services and resources designed to enhance patient adherence with his/her therapeutic regimens; i) Coordinating and integrating medication therapy management services within the broader health care-management services being provided to the patient.[10]

The provision of MTM services shall include:

i) Patient-specific and individualized services provided directly by a pharmacist to the patient.

ii) Support system that establishes and maintainspatient/caregiver-pharmacist relationship through face-to-face interaction as the preferred method of delivery whenever possible.

iii) Opportunities for pharmacists and other qualified health care providers to identify patients who should receive MTM services.

iv) Payment for MTM services.

v) Processes to improve continuity of care, outcomes, and outcome measures.[9]

The achievement of comprehensive medication management requires that the pharmacist practitioner carry out the following steps[10]:

1. Identify patients who have not achieved clinical goal of therapy.

2. Understand the patient's personal medication experience/ history and preference/beliefs.

3. Identify actual use patterns of all medications including over-the-counter, bioactive supplements, and prescribed medications.

4. Assess each medication (in the following order) for appropriateness, effectiveness, safety (including drug interactions) and adherence, focused on achievement of the clinical goals of each therapy.

5. Identify all drug therapy problems, DTPs, (the gap between current therapy and that needed to achieve optimal outcomes)

6. Develop a care plan addressing recommended steps, including therapeutic changes needed to achieve optimal outcomes.

7. Patient agrees with and understands care plan, which is communicated to the prescriber/provider for his or her consent/support.

8. Document all steps and current clinical status versus goals of therapy.

9. Follow up evaluations with the patient are critical to determine effects of changes, reassess actual outcomes, and recommend future therapeutic changes to achieve desired clinical goals.

10. Comprehensive medication management is a repetitive process. Care is coordinated with personalized goals of therapy are understood by all team members.

As pharmacy education, training and practice continue to evolve to a primarily clinical "patient-centered" focus, pharmacists are gaining recognition from other healthcare professionals and the public as "Medication Therapy Experts" to provide MTM services in settings where patients or their care givers can be actively involved in managing their medications.

Patients who benefit most from MTM services

It was estimated that one out of two ambulatory patients filling a prescription has a medication-related problem that is of enough concern that it needs to be addressed.[10] Therefore, any patients using prescription and non prescription drugs, herbal products and other dietary supplements could potentially benefit from these services, especially if DRPs are discovered or suspected. Opportunities for Identification for patients targeted for MTM services may result from many sources including: pharmacist identification, physician or other healthcare professional referral, or patient self-referral. Patients may be evaluated for MTM services regardless of the number of medications they use or their specific disease state(s). The following considerations may help provide assistance in prioritizing patients who may benefit the most from these services.[9,10]

a) A patient who has experienced a transition of care, and his/her regimen has changed; b) Patients who take five or more chronic medications (including prescription and herbal products and other dietary supplements); c) Patient who has at least one chronic health condition (e.g., heart failure, diabetes, hypertension, hyperlipidemia, asthma, osteoporosis, depression, osteoarthritis, chronic obstructive pulmonary disease); d) Patients who has laboratory values outside the normal rangethat could be caused by or may be improved with medication therapy; e) Patient who has demonstrated nonadherence (including underuse or overuse) to a medication regimen; f) Patients who has limited health literacy or cultural differences, requiring special communication strategies to optimize care; g) Patient who wants or needs to reduce out-of-pocket medication costs; h) Patient who has recently experienced an adverse event (medication or non-medication related) while receiving care; i) Patient who is taking high-risk medication(s) including narrow therapeutic index drugs (e.g., warfarin, phenytoin, digoxin, methotrexate); j) Patient who self-identifies and presents with perceived need for MTM services.

Core element of an MTM service model in pharmacy practice

The framework for the delivery of MTM servicesas a model of pharmacy practice (Figure 1) includes five core elements namely; 1) Medication therapy review (MTR), 2) Personal medication record (PMR), 3) Medication-related action plan, 4) Intervention and/or referral, and 5) Documentation and follow-up. Every core element is

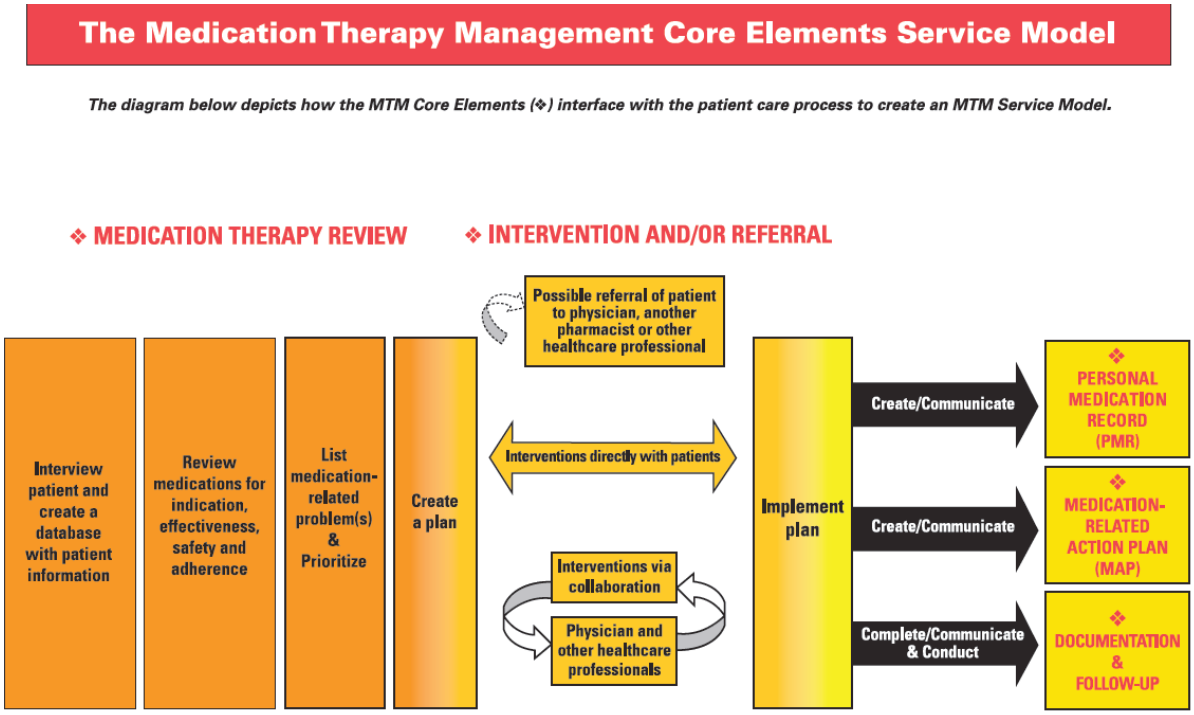

Figure 1: Flow chart of a medication therapy management service model[10]

integral to the provision of MTM; however, the sequence and the delivery of the core elements may be modified to meet an individual patient's needs.[10]

I. *Medication therapy review (MTR)*:

It was documented that pharmacist-provided MTR and consultation in various settings has resulted in reductions in physician visits, emergency department visits, hospital visits and overall healthcare costs.[13-20] In addition, pharmacists have been shown to obtain accurate and efficient medication-related information from patients.[14,21,22]

MTR is a systematic process that is conducted between the patient and pharmacist to collect patient-specific information, assess drug therapies to identify DRPs (also known as medication-related problems), develop a prioritized list of DRPs and create a plan to resolve them. MTR is designed toimprove patient's knowledge of their medications, address problems and concerns that patients may have, and encourage patients to self-manage their medications and their health condition(s). The MTR can be comprehensive or targeted to an actual or potential DRP.

In a comprehensive MTR, ideally the patient presents all current medications to the pharmacist. The pharmacist then assesses the patient's medications for the presence of any DRPs including adherence and works with the patient, the physician or any other healthcare professional to determine appropriate options for resolving identified problems. In addition, the pharmacist educates his/her patient to improve the patient's self-management of his/her medications. Targeted MTRs are used to address an actual or potential DRP. Ideally targeted MTRs are performed for patients who have received a comprehensive MTR. MTR may include the following:

- Patient interview, to gather data including demographic information, general health and activity status, medical history, medication history, immunization history, and patient's thoughts or feelings about their conditions and medications use.

- Assessing, on the basis of all relevant clinical information available to the pharmacist, the patient's physical and overall health status, including current and previous disease and conditions.

- Assessing patient's values, preferences, quality of life and goal of therapy.

- Assessing cultural issues, education level, language barriers, literacy level and any other communication barriers that could affect outcomes.

- Evaluating the patient to detect symptoms that could be attributed to adverse events caused by his/her current medications.

- Interpreting, monitoring, and assessing patient's laboratory results.

- Assessing, identifying, and prioritizing medication therapy problems related to: a) The clinical appropriateness of each medication being taken by the patient, including benefit versus risk; b) The appropriateness of the dose and dosing regimen of each medication, including consideration of indications, contraindications, potential ADRs, and potential problems with concomitant medications; c) Therapeutic duplication or any unnecessary medications; d) Adherence to the therapy, untreated diseases or conditions; e) Medication cost considerations; f) Healthcare/medication access considerations.

- Developing a plan for resolving each DRP identified.

- Providing education and training on the appropriate use of medications and monitoring devices and the importance of medication adherence and understanding

treatment goals.

- Coaching patients to be in control to manage their medications.

- Monitoring and evaluating the patient's response to therapy, including safety and effectiveness

- Communicating appropriate information to the physician or other healthcare professionals, including consultation on the selection of medications, suggestions to address identified medication problems, updates on the patient's progress and recommended follow-up care.[23]

In this service model, a patient would receive an annual comprehensive MTR and additional targeted MTRs to address new or ongoing DRPs.

II. *Personal medication record (PMR)*

The personal medication record is a comprehensive record of the patient's medications (prescription, nonprescription medications, herbal products and other dietary supplements). This record may be completed either by the patient with the assistance of the pharmacist, or the pharmacist, or by updating an existing PMR. PMR could be generated electronically or may be produced manually. In any case, the information should be written at a literacy level that is appropriate for and easily understood by the patient. In an institutional setting, the PMR may be created at discharge from the medication administration record or patient chart for use by the patient in the outpatient setting. The PMR contains information to assist the patient in his/her overall medications self-management.

The PMR, which is intended for useby the patient to self-manage his/her medications, may include the following information[24]: a) Patient's name, birth date, patient's phone number and emergency contact information; b) Primary care physician information; c) Pharmacy/ pharmacist information; d) Allergies [previous incidence and what happened during this incidence]; e) Other DRPs [e.g. what medication caused the problem? What was the problem?]; f) Potential questions for patients to ask about their medications; g) Date last updated; h) Date last reviewed by the pharmacist, physician or other healthcare professional; i) Patient and healthcare providers' signatures; and j) For each medication, inclusion of the following: Medication' name and dose; Indication; Instruction for use; Start and stop dates; ordering prescriber and his/her contact information; and special instruction.

The maintenance of the PMR is a collaborative effort among the patient, pharmacist, physician and other healthcare professionals. All parties should be informed about this record, the importance of updating and maintaining it. Patients should be educated and encouraged to maintain and update this document and to carry it with them at all times and shares it with all healthcare providers in all settings to help ensure that all healthcare professionals are aware of their current medication regimen.

Each time the patient receives a new medication; has a current medication discontinued; has an instruction change; begins using a new drug whether prescribed or non-prescribed, herbal product, or other dietary supplement; or has any other changes to the medication regimen, the patient should update the PMR to help ensure current and accurate records. Pharmacists may use the PMR to communicate and collaborate with physicians to achieve optimal patient outcomes.[23]

III. *Medication-related action plan (MAP)*

Advocating the need for a patient-centered form of healthcare has led to the development of MTM model of pharmaceutical care practice.[8,9,24,25] MAP is a patient-centric document containing a list of actions for the patient to use in following the progress for self-management. A care plan is the health professional's course of action for helping a patient achieving specific health goals.[25,26] The care plan is an important component of the documentation. In addition to the care plan, which is developed by the pharmacist and used in collaborative care of the, the patient receives an individualized MAP in medication self management. The patient's MAP includes only items that the patient can act on that are within the scope of practice or that have agreed on by relevant members of the healthcare team. The MAP should not include outstanding actions items that still require physician or other healthcare professional's review or approval. Completion of the MAP is a collaborative effort between the pharmacist and the patient. When coupled with education, the patient MAP is an essential element for incorporating the patient-centered approach into the MTM service model.

The MAP which is intended for use by the patient, may include: a) Patient name, primary care physician's as well as pharmacy's information b) date of MAP creation; c) Action steps for the patient; d) Notes for the patient; e) Appointment information for follow-up with the pharmacist if applicable.

Specific items that require pharmacist intervention should be included on a MAP distributed to the patient on a follow-up visit. In institutional settings the MAP could be established at the patient is discharged from the institution.

IV. *Intervention and/or referral*:

The positive impact of pharmacist interventions on outcomes related to DRPs has been shown in numerous studies.[27-31] The intent of intervention and/or referral is to optimize medication use, enhance continuity of care and encourage patients to take advantage of and benefit from healthcare services to prevent future adverse outcomes.

When delivering MTM, the pharmacist provides consultative services and intervenes to address DRPs (Medication-related problems); when necessary, the pharmacist refers the patient to a physician or other healthcare professional.

During the course of an MTM encounter, medication-related problems (DRPs) may be identified that require the pharmacist to intervene on the patient's behalf, through communicating appropriate information to physicians or other healthcare professional, to resolve existing or potential DRP including consultation on the selection of medications, suggestion to address DRPs, and

recommended follow-up care. Pharmacist interventions involve: starting new medication therapies, increasing dosage, decreasing dosage, discontinuing drug therapies and providing patient-specific drug information and explanations. Appropriate resolution of medication problems requires collaboration and communication between the patient, the pharmacist and the patient's physician. Sometimes, the patient's condition or medication therapy may be highly specialized or complex and the patient's needs may extend beyond the core elements of MTM service delivery. In such cases, pharmacists may provide additional services according to their expertise or refer the patient to a physician, other pharmacist or other healthcare professional.

V. *Documentation and follow-up*

Documentation is an essential element of the MTM service model. Because documentation eventually could be subject to inquiry, pharmacists should remember that if a patient's record does not include documentation of the care provided, then it will be assumed that the action never occurred.[31] MTM services are documented in a consistent manner, and a follow-up MTM visit is scheduled based on the patient's medication-related needs or the patient is transitioned from one care setting to another. A pharmacist could completely assess a patient, consult with the prescribing physician, and make modifications to the regimen based on the physician's orders; however, if that sequence of events is not thoroughly documented to acknowledge the collaborative efforts, it could be concluded that the pharmacist acted independently. The pharmacist documents services and intervention(s) in a manner appropriate for evaluating patient's progress. The generated document may also be used to reimburse pharmacists for the provided service(s).

Ideally documentation will be completed electronically but it can also be documented on paper. Proper documentation may serve several purposes including: a) Facilitating communication the pharmacist and the patient's other health care providers regarding recommendations intended to resolve or monitor actual or potential DRPs; b) Improving patient care and outcomes; c) Enhancing the continuity of patient care among providers and care settings; d) Ensuring compliance with laws and regulations for the maintenance of patient records; e) Protecting against professional liability; f) Demonstrating the value of pharmacist-provided MTM services and g) Demonstrating clinical, economic and humanistic outcomes.

MTM documentation includes creating and maintaining an on-going patient-specific record that contains, a record of all provided care in an established standard healthcare professional format (e.g. The pharmacotherapy workup notes[8,9], the SOAP [subjective observations, objective observations, assessment and plan] notes).[32,33] Other documentation formats include: FARM [finding, assessment, recommendation/resolution, management] and TITRS [title, introduction, text, recommendation, and signature].[31] The inclusion of resources such as PMP, MAP and other patient-specific forms will assist the pharmacist in maintaining professional documentation.

Communication should be provided or sent to key participants, including patients, physicians and payers. Providing the patient with applicable documentation that he or she can easily understand is vital to facilitating active involvement in the care process. Patient may be provided with PMR, MAP and additional education materials. Physicians and other healthcare providers may be provided with a cover letter, the patient's PMR, The SOAP note, and care plan. Communicating with payers and providing appropriate billing information is also necessary.

VI. *Follow-up*

The pharmacist should arrange for consistent follow-up MTM in accordance with the patient's unique drug-related needs. All follow-up evaluations and interactions with the patient and his or her other healthcare provider(s) should be included in MTM documentation.[7,34] When the a patient's care setting changes (e.g. hospital admission, hospital to home, hospital to long-term care facility), the pharmacist helps transition the patient to the new care setting to facilitate continued MTM services. In this situation, the initial pharmacist providing MTM services cooperates with the patient's new pharmacist provider to facilitate the coordinated transition of the patient, including the transfer of relevant medication and other health-related information.

Acceptance of pharmaceutical care and the introduction of MTM in the Libyan pharmacy education and practice

As a term, MTM is still largely unknown in our region. Pharmacists graduated from Libyan schools of pharmacy in the 21th century are more used to pharmaceutical care which has been introduced relatively recently. Both terms however, are still confused with clinical pharmacy, which remains a priority in several countries in the Arab world.

When scanning curricula of the Faculty of Pharmacy at the University of Tripoli, which is considered to be the pioneer in pharmacy education in Libya, it's evident that they focus on producing pharmacists with wide array of knowledge and skills within the natural and pharmaceutical sciences and in pharmaceutical technology. Most of our recent graduates, however, go upon graduation to work in community and hospital pharmacy including the clinical setting. Consequently, our graduates face the challenge of serving in these setting with practically little or almost no pharmacy practice training whatsoever.

Pharmacists' competencies and job prospects certainly impact the way sub-disciplines such as pharmacy practice and clinical pharmacy are viewed within the pharmacy education in our country. They are considered valuable, but since most of our faculty members see that our students need the more natural and pharmaceutical science-oriented disciplines, not much room was given to patient-oriented discipline and the integration of pharmaceutical knowledge into patient care. A further obstacle is the fact that clinical pharmacy and pharmacy practice faculty members are separated, organizationally, within our Faculty of Pharmacy. This weakens the opportunity to collaborate and give a holistic picture of how the

promising pharmacists can use their skills in patient care, from a theoretical and practical perspective. Lack of training and internship programs, stipulated by different international pharmacy curricula, has led to graduating knowledgeable but unskillful pharmacists who won't be able to directly get involved in patient-oriented practice. In addition to what already has been said, the absence of pharmacy laws and regulations made the picture of the country's pharmacy profession even more unclear.

The Faculty of Pharmacy, at the University of Tripoli (UOT), is lately offering undergraduate patient-oriented pharmacy practice courses which is considered a significant development taking into account the slow pace at which the practice of pharmacy was moving. Some of our junior pharmacy graduates are motivated to test and implement patient-centered services. These pharmacists aspire to provide more structured service through their clinical pharmacy roles in hospitals; however, their work was sporadic and not officially documented.

The brightest prospect for applying medication management services in the near future lies within public hospitals, in addition to private clinics (which are now very prominent in the Libyan healthcare system and require validation of their services). Physicians working in these institutions are now demanding that "clinical pharmacists" get involved in managing patients' medications**.** It is, therefore, crucial that pharmacists have a central role in ensuring optimal use of medicines in the clinical setting and otherwise. The positive outcomes that resulted from pharmacists' involvement in managing patients' medicines should drive the establishment of medication management practice standards in the Libyan healthcare structure. The very few number of trained clinical pharmacists are either researchers and/or teachers, therefore, the establishment of clinical/ medication management educational program is absolutely necessary to make pharmaceutical care and MTM services a reality in the coming years.

It is worth mentioning that the author had accumulated pharmaceutical care practice cases[35], (in an ongoing research project from the year 2007 to date), through supervising undergraduate as well as graduate students who collaborated effectively with physicians and other health care professionals in providing responsible drug therapy and performed medication management services; including patient education and counseling, providing patient's medication-related needs and resolving DRPs, for in- and out-patients suffering from chronic diseases (including; Diabetes Mellitus, Asthma, COPD, Hypertension, Epilepsy and HIV/HCV infections) in major Tripoli hospitals. The results of this research project concluded that these services have achieved positive patients'outcomes and contributed to the improvement of individual patients' overall health. A sample of these cases was presented at a workshop held, as a part of the activities of the 16th Scientific Congress of the Association of Colleges of Pharmacy in the Arab World, in Benghazi, Libya, in November 2013.[36] Young pharmacists who attended this workshop had shown great interest in getting educated and trained to deliver such services. The author of this article has received "certificate of achievement" in MTM, after undergoing a training program at the school of pharmacy, State University of New York, at Buffalo, which was sponsored by the American Pharmacist Association, in August, 2014. As a tenured professor at the Faculty of Pharmacy-UOT, the author together with other interested faculty members is capable and willing to establish an educational training program in MTM for pharmacists nationwide.

In real life practice, Libyan pharmacists are facing a great challenge that is the increasing frustration of being a professional within a retail environment. Clinical pharmacist/ Medication therapy experts therefore, will need to be compensated for the profits their colleagues are making in retail pharmacy. It is ultimately, the individual pharmacists' determination to provide medication management to patients, and the decision makers' willingnesswhich will lead the way and eventually will reach the tipping point whereby pharmaceutical care and MTM services become the generally accepted standard for all pharmacists.

CONCLUSION

Medication management is a global concern. The unacceptable rise in the level of adverse eventsevidently has led to the increase in both human and economic costs. The pharmacy profession consists of individuals who have the knowledge base required to make a difference. Professional associations in many parts of the world are supportive of major changes in this direction for the profession. Establishing the pharmacist as a genuinehealthcare provider, rather than merely a supplier and distributer of products, is now a central part of any discussion within the profession.

Pharmacy education is witnessing rapid change all over the world, including our country. These changes are hoped to reflect a wider recognition and application of pharmaceutical care and medication management services in the hospital and community settings. An essential step to accomplish this, is to move proactively in order to promote and develop a pharmacist identity that is clinical and patient-centered in nature. Recognizing the need for equivalent services in our country, many pharmacists are eager to expand their patient care activities and assist patients and caregivers with medication-related problems. At the time of writing this article, our beloved country was passing through a political turmoil and instability to say the least. We hope that these changes also, bring about changes in the healthcare education and practices in Libya.

In conclusion, MTM services have been shown to decrease medical costs, improve clinical outcomes and have significant impact on the appropriateness, effectiveness, safety, and compliance with medications. The presented MTM core elements may be applicable to patients in all care settings where the patients or their caregivers can be actively involved with managing their medications, taking full advantage of the pharmacist role as the "medication therapy expert".

The Faculty of Pharmacy at the University of Tripoli is teaching all the necessary knowledge and skills that a pharmacist needs to apply in order to participate in patient-

centered practices and eventually perform medication management services. The necessary courses include but not limited to: therapeutics, pharmaceutical care, disease management, patients counseling as well other clinical knowledge and skills. It is however, necessary that our graduates who wish to provide such services to put all their knowledge into practice and fine-tune certain skills, knowledge and expertise to support these services. No doubt many staff members of this faculty, who believe that the "Caring Paradigm" is essential to practice the pharmacy profession, are capable of providinga bridging program for our interested graduates to prepare them to be "Medication-Therapy Managers" through a "Clinical Pharmacy Practice Training Certificate". The program for this certificate may be proposed and organized by experienced panel of faculty members and acknowledged by the Libyan Ministry of Health.

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