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The role of pharmacists in medication adherence of patients: A review

Yasser Ali Yahya Musleh[1], Arwa Mohammed ibrahim Hawi[1], Hassan Ali Hassan Khormi[1], Fatimah Hussain Almalki[1] ,Mashael Ibrahim Assiri[2],

1. Department of pharmacy ,Jazan, Healthcare Cluster
2. Department of pharmacy Bisha , Assir Healthcare Cluster

Corresponding author
Yasser Ali Yahya Musleh
yassermusleh2021@gmail.com
Department of pharmacy ,Jazan, Healthcare Cluster

Abstract
Background:
Medication adherence is the cornerstone of effective therapeutic treatment, and it affects disease progression in both chronic and acute health conditions. Non-adherence to medication is common among patients, especially those with chronic conditions, as the therapeutic regimen lasts for a long duration. Patient education and counseling can be effective in resolving issues associated with medication non-adherence. Pharmacists of both clinical and community settings can help the patients in achieving better adherence level via several interventions.
Aim:
To overview the role of pharmacists in medication adherence among patients with different diseases and conditions.
Methods:
Online exploration process was adopted to obtain related articles and using several related terms. All types of articles written in English language were included and there was no limitation to the publication date of the included article.
Results:
The included articles were discussed under major three titles, one focused on the role of clinical pharmacists, the second focused on community pharmacists and the third title overviewed the perception and knowledge of pharmacists regarding their role.
Conclusion:
Both clinical and community pharmacists have significant role in improving medication adherence among different chronic conditions. Pharmacists cloud help patients to adhere to their medications by the adoption of several interventions, and strategies. However, there is lack in understanding the perspective, knowledge and attitude of pharmacists regarding their role in medication adherence of patients.
Keywords: Pharmacists, Role, Medication adherence.

Introduction:

Medication-related problems, including medication non-adherence, can result in adverse outcomes **[1]**. Medication adherence is the extent to which the patients follow the prescribed therapeutic regimens. It is the cornerstone of effective outcomes as it affects the treatment outcomes, disease progression in both chronic and acute health conditions, and overall patient health **[2]**. Patients who don't administrate their medications as prescribed are at a high risk of disease progression, higher healthcare costs, and mortality **[3]**. Non-adherence to medication is common among those with chronic illness, subjects on multiple pharmacological therapy, and psychiatric patients. Almost 50% of cases with chronic diseases don't take their medications as prescribed,

with a wide range of medication adherence of 17-80% **[3]**. Non-adherence to medication is very common among those with chronic conditions. There are various factors that contribute to medication non-adherence, including patients‘ characters and views, social issues, illness, and services provided to them **[3]**.

Patient counseling can be effective in resolving issues associated with medication non-adherence **[4]**. Pharmacists have the chance to provide additional services for patients by enhancing their medication adherence **[5]**. Pharmacists can help patients achieve better adherence levels; several interventions can increase medication adherence, such as educating patients, counseling, and conducting interviews on medication history **[6]**. Other interventions include pill cards, pill boxes, information leaflets, and reminder charts. However, educating patients is one of the principal interventions that are applied to improve adherence of patients **[7]**. The pharmacist's professional function, especially in medical settings, is no longer just drug dispensing but further participation in clinical treatment and providing pharmaceutical care **[8]**. In hospital settings, pharmacists play an increasingly crucial role in improving medication adherence by assessing medication adherence, providing consultations, identifying predisposing factors, and recommending target mediation adherence modalities **[9, 10]**. Previous analysis revealed that the interventions of clinical pharmacists significantly enhanced medication adherence **[11]**. Also, in community settings, pharmacists can help patients overcome obstacles to adherence, and they can improve adherence, self-care, and persistence of patients in some cases **[12]**. This review was established to overview the role of pharmacists in medication adherence of patients with different diseases and conditions.

Materials and methods:

The articles incorporated to write this review were obtained through exploration of the scientific websites that included PubMed, Google Scholar, and Science Direct. The exploration procedure was done using several keywords relevant to our subject to obtain related articles; such terms were used in different combinations to obtain all possible related articles. These keywords included "Pharmacists, Community, Clinical, Impact, Role, Counseling, Medication adherence, Knowledge, Perception, and Patients." The obtained studies and articles were reviewed for titles to select relevant ones focusing on our subject and exclude irrelevant ones. All types of articles written in English were included, and there was no limitation to the publication date. The role of clinical pharmacists was discussed based on different diseases, whereas the role of community pharmacists was discussed as a whole due to insufficient studies.

Discussion:

-The role of clinical pharmacists in medication adherence:

Counseling is a procedure that involves providing written or oral medication information to the patients or their representatives **[3]**. Counseling is performed to provide the patients and their families with the correct understanding of medication **[13]**. Counseling includes instruction on the method to use the medication, medication goal, schedules, uses, suspected adverse outcomes, signs of toxicity, storage, preventive measures, lifestyle, and food changes **[3, 13]**. The objective of counseling is to achieve appropriate outcomes to improve the patients' lives **[13]**. Counseling the pharmacist is essential for the management of patients, especially those with chronic illness **[13]**.

1-Role of pharmacists in medication adherence in diabetes:

Regarding diabetic patients, the pharmacists can tell the patients how crucial to take the medication prescribed by the physicians to properly manage the blood sugar. Pharmacists can check the medication regimen and provides the essential explanations

on how each medication exert its function, and address concerns regarding undesired side effects of the drugs **[13]**.

An interventional study compared delivering pharmacist counseling among diabetic patients by randomizing patients into 55 diabetic subjects in the interventional category who received counseling and 51 patients in the usual care group. It was found that the intervention provided by the clinical pharmacists through educating patients and medication counseling resulted in considerable improvement in medication adherence and glycemic control among diabetic patients in the intervention category compared to the other group **[14]**.

A previous review from Indonesia included six articles that deduced that counseling pharmacists had a great impact on type 2 diabetes mellitus (T2DM) patients by increasing their knowledge and adherence to medication **[13]**. Medication adherence and frequency of hospitalization of T2DM could be improved by pharmacist-led medication therapy management provided to diabetic patients by clinical pharmacists. It was suggested that clinical pharmacists be fully engaged in patient care in order to improve their medication adherence and therapeutic outcomes **[15]**.

2-Role of pharmacists in medication adherence in asthma:

Asthma is another chronic illness that requires continuous treatment and good adherence to therapy. The role of pharmacists in medication adherence among asthma patients was assessed by the inclusion of two categories: the intervention group received 2-month follow-up educational and/or cognitive-behavioral interventions by pharmacists to resolve identified adherence barriers, while the control group continued with traditional care. Pharmacist-led intervention potentially enhanced medication adherence and appropriate use of inhalers among the subjects who received the intervention **[5]**.

3-Role of pharmacists in medication adherence in neurological and mental diseases:

The characteristics of the patient population affect and lead to variations in the adherence rate among patients **[16]**. In the epilepsy population, adherence to anti-epileptic drugs (AED) is necessary for controlling seizures **[16]**. In a previous study focused on patients with epilepsy, the study investigated the impact of pharmacist-assisted patient counseling by counseling patients regarding their medications and the disease every follow-up visit for six months. It was found that adherence of patients to AED was improved in the second follow-up compared to the first follow-up. Such findings reveal the significant role of pharmacists in medication adherence among epileptic patients. Also, this improvement in adherence will, in turn, lead to improvement and reduction in seizure episodes **[16]**.

A scoping review identified the role of pharmacists' intervention for medication adherence among epileptic patients by enrolling ten articles; it was deduced that pharmacist interventions had been found to be effective in improving medication adherence in this population of patients. Moreover, such interventions had a crucial role in improving other therapeutic outcomes, including knowledge of patients regarding self-management, illness perception, and the efficacy of anti-epileptic drugs in controlling seizures **[17]**.

Also, pharmacists have a considerable role in improving adherence to the medication of subjects with mental diseases **[18]**. Counseling strategy has been revealed to improve adherence to medication among patients with schizophrenia **[19, 20]**. In a research, it was found that patient-oriented counseling sessions provided by pharmacists could improve adherence to medication among schizophrenia, depression, and bipolar-affected disorder cases **[21]**.

Additionally, pharmacists' interventions have displayed beneficial impacts for improving therapeutic outcomes. Pharmacists were found to have a significant role in adherence to anti-depressants among the depressed population. In a systematic review of 13 research, it was found that patient adherence to anti-depressants was improved through pharmacist intervention. The most effective strategy adopted by the pharmacists was combining patient education and drug monitoring **[22]**.

4-Role of pharmacists in medication adherence in autoimmune disease:

Psoriasis is a chronic autoimmune disease of the skin that is featured by an elevated growth cycle of skin cells, resulting in the build-up of lesions **[23]**. Medication adherence for psoriatic patients is necessary to get cured and restore normal health. However, non-adherence is very common among those patients due to various reasons such as lack of knowledge, neglect of fullness, and forgetfulness. One study involved 63 patients who underwent pre-posttest assessment to identify the role of clinical pharmacists in improving their medication adherence. The clinical pharmacists provided patients with information leaflets and education. Adherence of the patients was improved in the experimental group compared to the controls who didn't receive education provided by the pharmacists. Therefore, clinical pharmacists are important in providing patients with knowledge about long-term autoimmune disease management, such as psoriasis **[23]**.

5-Role of pharmacists in medication adherence in cancer:

Clinical pharmacists are known to have an important role in caring for cancer patients by improving the usage of medications prescribed to those patients **[24]**. The major role of pharmacists is to review the medication and educate the patients **[25]**. In one study focused on the role of pharmacists in medication adherence among cancer patients, it was found that pharmacist counseling and education led to improvement in medication adherence among this population of patients **[25]**. In a scoping review, it was found that improving communication between oncology patients and hospital pharmacists in terms of therapy with more active engagement of the hospital pharmacists in therapy monitoring can improve medication adherence of those patients by overcoming the factors affecting adherence of medication **[26]**.

-The role of community pharmacists in medication adherence:

Counseling with pharmacists is a part of direct clinical pharmacy services, and pharmacists are responsible for issues related to patients' medications **[13]**. However, community pharmacists are also well-positioned to help patients overcome obstacles to adherence. Previous research revealed that community pharmacists can improve adherence, self-care, and persistence of patients in some cases **[12]**. In a previous survey, it was found that 75% of the participants have visited the community pharmacists for health-related reasons; therefore, community pharmacists are well-placed in the community to support patients with their treatment usage and adherence **[27]**.

However, research on the role of community pharmacists in medication adherence is lacking. Based on a previous systematic review, face-to-face intervention provided by community pharmacists resulted in more effective medication adherence among patients compared to other types of interventions **[28]**. Previous research that included 98 community pharmacists and 1186 patients revealed that community pharmacist-led medication adherence intervention was efficient in improving adherence and clinical outcomes among patients complaining of asthma, hypertension, and chronic obstructive pulmonary diseases. This intervention provided by the community pharmacists included tailored strategies based on the degree of non-adherence and adherence barrier **[29]**.

Hypercholesterolemia is a potential risk factor for cardiovascular diseases, and some patients require therapeutic management. One research revealed that face-to-face intervention provided by community pharmacists resulted in greater adherence to medication when the patients received it at the beginning of statin therapy **[12]**. One study displayed that subjects with poorly controlled lipid diseases who were counseled by pharmacists in community pharmacies experienced an improvement in persistence, adherence to therapy, and improved lipid levels **[30]**.

A pre-post analysis assessed the impact of pharmacist-led educational campaigns on T2DM patients visiting community pharmacists. It was found that this intervention provided by pharmacists was effective in improving the medication adherence of diabetic patients. Also, the patients displayed improvement in diabetes knowledge, self-care practice, and glycemic control **[31]**. Another research studied the consultation of community pharmacists by diabetic patients revealed that this consultation led to improved levels of glycosylated hemoglobin and lipid profile, with a reduction in medical costs and elevated worker productivity **[32]**.

-Perspective and knowledge of pharmacists regarding their role in medication adherence:

Increasing the implementation of pharmacists in counseling to improve medication adherence of patients may face several challenges, especially in low and middle-income countries. This due to the high workload that restricts the pharmacists ability to provide adequate counseling to the patients. So, it is necessary to identify the perspective of pharmacists and their knowledge regarding their role in medication adherence **[33]**.

In a previous study, there 45.45% of the pharmacists reported that educational-based pharmacist service was the most preferred to them; however, larger proportion (66.67%) stated that consultation and counseling is the most common service to improve adherence. The most reported barrier to adopt such services by pharmacists, included limited time, human resources and high workload of the pharmacists **[33]**.

Another study revealed that although all included 95 community pharmacists were aware of medication adherence programs and had positive attitude, they had limited practice to implement medication adherence programs for patients **[34]**.

A scoping review focused on mental illness and encompassed 11 articles that enrolled clinical pharmacists, community pharmacists, and pharmacists working in mental clinics discovered that pharmacists had varying education and training levels. It was indicated that there was a need for expanded pharmacist roles within multidisciplinary mental health clinics to help pharmacists confidently improve medication adherence for mental health patients. Such findings reveal that pharmacists have inadequate practice regarding counseling to help patients adhere to medication adherence due to inadequate training **[35]**.

Conclusion:

Both clinical and community pharmacists have a significant role in improving patients' medication adherence and, as a result, improving their clinical outcomes. The pharmacist's role was significant in improving medication adherence among different chronic conditions. The role of pharmacists was reported mainly for chronic illnesses and conditions as they require adherence to medication for a long duration. Pharmacists can help patients adhere to their medications by adopting several interventions, strategies, and tools, and these interventions and tools can be varied and tailored based on the degree and barrier of medication adherence among the patients. However, there is a lack of focus on the role of community pharmacists in medication adherence and improving the level of adherence among patients. Additionally, there is a lack of understanding of the perspective, knowledge, and attitude of pharmacists regarding

their role in the medication adherence of patients as their knowledge, perspective, and attitude are necessary to provide effective counseling and acceptance to get involved in educating the patients regarding adherence.

Limitations, strengths, and recommendations:

This review has some limitations, including the lack of focus on community pharmacists' role in medication adherence due to the lack of studies focusing on community pharmacists. Also, there is a lack of a comprehensive overview of the perception and knowledge of pharmacists regarding their role in medication adherence. Additionally, we didn't focus on the different counseling interventions and strategies provided by pharmacists to patients to improve their adherence, as this wasn't the main goal of our review. Nonetheless, there were several strengths of this review; this is the first review to overview the role of clinical and community pharmacists regarding their role in medication adherence, as the previous reviews were either scoping or systematic. Also, we reported the role of pharmacists in determining the different conditions of patients. Additionally, we highlighted the gaps in the literature regarding the current subject, including the lack of studies focusing on community pharmacists and studies investigating the perspective and knowledge of pharmacists regarding their role in adherence to medication. Therefore, further studies are recommended to focus on community pharmacists, perspectives, knowledge, and attitudes of pharmacists regarding their roles.

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