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Impact Analysis of Intervention of Community Pharmacists in Enhancing Patient Medication

Niyazi Burhan Aldin Mohammad, marwanmerkhan@uomosul.edu.iq (*)
Department of Pharmacy, Al-Qalam University College, Kirkuk, 36001, Iraq

Marwan M. Merkhan, marwanmerkhan@uomosul.edu.iq
College of Pharmacy, University of Mosul, Mosul, 41002, Iraq

(*) Corresponding author

Abstract

General Background Medication adherence represents a fundamental determinant of therapeutic success, whereas non-adherence triggers treatment failure and escalates global healthcare expenditures. **Specific Background** Community pharmacists are uniquely positioned as accessible frontline healthcare providers capable of delivering patient-centered pharmaceutical care and clinical counseling beyond traditional drug dispensing. **Knowledge Gap** However, the documented effectiveness of these pharmacy-led programs remains variable across different clinical settings, and synthesized data regarding their systemic impact on diverse disease states remain limited. **Aims** This study evaluates the impact of community pharmacist-led interventions on patient medication compliance and comprehensive health outcomes across multiple chronic conditions. **Results** The findings demonstrate that structured community pharmacy services significantly enhance drug compliance and optimized disease control, yielding marked improvements in blood pressure regulation, asthma control, chronic obstructive pulmonary disease management, and cholesterol level optimization. Conversely, educational interventions delivered exclusively by pharmacists demonstrate no significant impact on mitigating depressive symptoms in adult outpatients. **Novelty** This comprehensive review systematically maps multi-disciplinary pharmacy interventions across respiratory, cardiovascular, metabolic, and postoperative care settings to delineate the explicit clinical boundaries of independent pharmaceutical counseling. **Implications** These results indicate that integrating community pharmacists into primary care pathways optimizes long-term therapeutic outcomes and reduces hospitalizations for chronic diseases, though mental health care requires a more integrated, multidisciplinary approach.

Keywords: Medication Adherence, Community Pharmacist, Chronic Disease, Patient Compliance, Health Outcomes

Key Findings Highlights

Community pharmacy programs significantly improve objective clinical markers for blood pressure, asthma, and cholesterol management.

Independent pharmacist-led educational interventions fail to produce measurable reductions in adult depressive symptomatology.

Integrated pharmaceutical care reduces hospital stays and decreases medication errors during transitions in postoperative and cystic fibrosis care.

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Introduction

Adherence to the drug therapy is connoted to the degree to which patients obey the instructions of the healthcare providers for the prescribed medication regimen (1). It is vital for the success of therapy and managing the diseases, considering that negative adherence can initiate the treatment failure and unnecessary healthcare costs (2). It has been documented that patients in developed countries may demonstrate low adherence rates regarding medications for chronic diseases (3). Adherence fluctuated by certain factors, including disease-related factors (e.g. absence of illness symptoms), factors relating to medications (e.g. difficulty of the drug regimen), factors relating to the healthcare system (e.g. healthcare services), patient features (e.g. knowledge of the condition and how to treat it), and socioeconomic variables (e.g. educational level) (4). The advantage of community pharmacies in counselling and educating adherence to medication and well-being has been supported by global evidence (5). The community pharmacy, having extensive knowledge of disease prevention and management and being in close access to the public, can deliver its care to enhance the patients' quality of life through effective medication therapy services (6). Recently, the role of community pharmacists has placed in patient-centred care and pharmaceutical care, moving beyond traditional dispensing responsibilities (7). This study offers a review of community pharmacist interventions in the health field, including medication adherence. The effectiveness of these interventions may differ based on the setting, because there are conflicts in implementation. However, some health outcomes and adherence are improved by community pharmacy, with relatively limited information available. The literature provides numerous diseases and medication adherence.

Methods

In October 2024, A thorough literature search was done to find papers that looked at community pharmacist-led treatments. The search plan was developed in conjunction with a subject-matter expert, and the keywords used in the search included terms related to community pharmacy services, patient compliance, medication adherence, and outcome assessment. Overall results about the impact analysis of the intervention of community pharmacists in enhancing patient medication were tabulated in Table 1.

Role of the community pharmacist in respiratory diseases

Armour et al. (2007) confirmed that the community pharmacist positively impacted asthma management due to proper medication distribution, offering a comprehensive, policy-driven type of care that **improves** patient outcomes(8). The Pharmacy Asthma Care Program (PACP) revealed that trained community pharmacists can truly have positive impacts on asthma control, spirometry, inhaler technique review, and adherence counselling. When community pharmacists handled asthma patients, they had three times improved the status of transition from severe to non-severe asthma, indicated by improved adherence to medications and quality of life. Moreover, community pharmacists improved the proper application of asthma action plans for delivered primary care(9).

An alternative study on non-pharmacological treatment of chronic obstructive pulmonary disease. The research concluded that counselling patients regarding lifestyle changes, such as increased physical activity, weight reduction, reduced sodium intake, and moderate coffee consumption, can be very helpful in improving quality of life and reducing hospitalisation rates. However, poor compliance is very common and still represents the main obstacle to this effective and cost-saving therapeutic approach(10,11). Similarly, the seeking for medical care was reduced in asthmatic patients after community pharmacist interventions in therapy counselling or education (8,10).

The community pharmacist plays a positive role in lung cancer via early diagnosis, supportive management, and treatment profile. Community pharmacists are first-line public assessors and educators for tobacco cessation—a leading cause of lung cancer—and handle early screening (12,13), because pharmacists can use assessment questionnaires and encourage referrals to proper healthcare services, hence prompting early diagnosis (14–16). Once diagnosed, community pharmacists become advisers for proper use of anticancer medications, influencing patient adherence, side-effect monitoring, and follow-up drug interactions to ensure optimal outcomes (17,18). Ultimately, interventions by community pharmacists have been shown to improve patient satisfaction (19–21).

The community pharmacist plays a positive role in cystic fibrosis (CF), starting with supportive access to the multidisciplinary CF team. Pharmacists are performing detailed medication reconciliations, encouraging medication adherence, and guaranteeing a safe dosing schedule, and follow-up drug-drug interactions and side effects (22,23). Their clinical implications improve clinical outcomes, including cooperation with community pharmacists for medication follow-up of aminoglycosides administration to emphasise the safe pharmacokinetic goals, decrease time to therapeutic plasma concentrations, and reduce hospital stay (24). Intervention of community pharmacists improves medication adherence, reduces hospitalisation (25,26), reduces medication administration times, and simplifies complex dosing regimens (27–29). In addition to these positive impacts, the integrated care encourages nutritional outcomes, which have been evidenced by restored patient weight and BMI (Autry et al., 2017). These experiences delivered by community pharmacy translated to cystic fibrosis patients and their families, ensuring sustainable treatment (27).

The community pharmacist plays a positive role in respiratory tract infections (RTIs) and the issue of antimicrobial sensitivity. The pharmacist's intervention reduces unnecessary referrals, for example, otitis media and sinusitis (31,32).

Role of the community pharmacist in diabetes mellitus

The community pharmacist plays a positive role in diabetes mellitus, including enhancing diabetes care through cooperation with primary healthcare providers. For example, the pharmacist optimised the use of metformin, renin-angiotensin system antagonists, and statins—reducing complications like microalbuminuria and neuropathy (1). The pharmacist provides care for personalising therapy and supporting preventive measures (33,34). Additionally, Nyamazana et al. (2021) reported that the community pharmacist's role extends to cover the prevention and management of diabetes mellitus (DM) and its complications through various educational initiatives (35). Community pharmacists screen DM, evaluating patients' well-being status, encouraging medication adherence, and providing patients' education for self-care(36). The pharmacists implement preventive measures to prevent DM complications, including smoking cessation, dietary modifications, and physical activity. Counselling to keep glycaemic control, maintain normal blood pressure, hypolipidemic therapy, antiplatelet therapy, and self-education(35). Community pharmacists have a positive role in diabetic foot ulceration (DFU) (Porseivi et al., 2022), including early identification, patient education, and referral. Pharmacists use screening protocols assess peripheral neuropathy and vasculopathy (37).

Role of the community pharmacist in cardiovascular system diseases

The community pharmacist plays a positive role in cardiovascular system diseases (CVD), as evidenced by 45 studies from collected data between 2002 and 2021, demonstrating that pharmacists positively impacted primary healthcare providers in managing CVD and helping patients with hypertension, diabetes, and dyslipidaemia (38). This role is represented as therapeutic drug monitoring, medication counselling, lifestyle modification, and health education(39). These roles of pharmacists are highly valuable in localities characterised by hard-to-reach populations to healthcare systems (40). From the overall 45 studies, about 11 studies included patient perceptions, and 10 confirmed patient satisfaction with the role of pharmacists in managing CVD(38).

Role of the community pharmacist in central nervous system diseases:

The community pharmacist plays a weak positive role in adherence to antidepressant drugs in adult depression outpatients, in 12 meta-analysis studies revealed that pharmacist interventions increased the medication adherence by two-fold during 5–6 months (41). Different intervention techniques were used, including counselling and telephone support (42,43). The overall findings demonstrated no improvement in depression symptoms due to pharmacist interventions alone(41). The reasons for the unexpected low role of pharmacists in depression were related to the short duration of the study (>6months), while antidepressants need a longer duration to work, and the complicated nature of depression.

The community pharmacist plays a positive role in Alzheimer's disease (AD) patients, and the healthcare providers involved in their management, including therapy management and counselling, revealed by 70% of caregivers seek advice from pharmacists for drug usage information (94%), adverse effect knowledge (48%), and drug-drug interactions (42%). It's worth mentioning that the common therapeutic regimen was a

memantine/donepezil combination, often plagued by insomnia and hallucinations, where a pharmacist can provide adherence care (44). The community pharmacist plays a positive role in Parkinson's disease (PD), including mitigating medication risk, encouraging adherence rate and improving quality of life. Pharmacists found and resolved 545 drug-related issues, including dosage adjustments (41.47%), mitigation of adverse drug reactions (24.77%), and suggested alternative medication (18.72%). For instance, levodopa is the principal medication for PD; however, improved efficacy in reducing the motor complications achieved by amantadine and selegiline(45).

The community pharmacist plays a positive role in bipolar disorder (BD), via improving outcomes of bipolar disorder (BD) patients, primarily focusing on medication management, encouraging adherence, and patient counselling (46). Pharmacist-led interventions, such as medication counselling, psychological education, and follow-up, have decreased drug-related problems and enhanced the care in psychiatric populations (47,48). Moreover, pharmacists support patients in identifying early signs of relapse, enhancing treatment satisfaction (49,50).

Role of the community pharmacist in gastrointestinal tract diseases:

The community pharmacist plays a positive role in peptic ulcer disease (PUD), through adjusting pharmacotherapy and **improving** patient outcomes, also pharmacist-led services—including medication review, patient and physician education, guideline implementation, and follow-up care—significantly enhance the rational use of anti-ulcer medications(51), such as proton pump inhibitors (PPIs). Pharmacist interventions were shown to correct irrational drug use—such as improper dosing, administration route, or unnecessary continuation—leading to a pooled odds ratio of 4.5 for improved rational medication use(52). Additionally, these interventions contributed to reduced treatment duration and lower medication costs, with a standardised mean difference of -0.72 in therapy length(53). Pharmacists also improved the appropriate use of acid-suppressive therapy for stress ulcer prophylaxis, supported by high physician acceptance rates of pharmacist recommendations (79.9% to 89.4%)(51).

Community pharmacists' interventions include education and counselling, medication management, monitoring and follow-up, and screening and risk prevention, which lead to medication adherence, improving quality of life, and increasing patient satisfaction in chronic disease management(54). Community pharmacists direct medication adherence in patients with Crohn's disease using counselling, since a single pharmacist adherence counselling session reduced non-adherence rates from 100% to 44.4% over a 24-month period in previously non-adherent patients, reflecting the role of pharmacists in optimising long-term therapeutic outcomes and preventing disease relapse in Crohn's disease through adherence counselling (55).

Role of the community pharmacist in liver diseases:

The community pharmacist plays a positive role in liver diseases (56), including early referral of Non-Alcoholic Fatty Liver Disease (NAFLD), which is epidemic health issue, pharmacists can act as first line screener of at-risk individuals within the community, using anthropometric measurements (BMI, waist-to-hip ratio), asking for positive family history, and using testing strips for biomarker testing of glucose, lipids, and HbA1c(57). Once NAFLD is diagnosed, the pharmacist's role becomes patient education, referral, and follow-up support(58–60).

This involves counselling patients on NAFLD, its progression risks, and lifestyle modifications (diet, exercise, and weight management)(58). A critical function is to facilitate timely referral to primary care physicians or specialists for definitive diagnosis and management, ensuring continuity of care(58,59). Pharmacists can also review medication profiles for hepatotoxic drugs and provide ongoing support and monitoring(58).

Role of the community pharmacist in women's health

The community pharmacist plays a positive role in women's health (61), including preconception, pregnancy, and postnatal care. Community pharmacists play a role in medication counselling and safety advice for pregnant and breastfeeding women, addressing concerns about prescription and over-the-counter medications (62,63). Counselling includes advice about the use of vitamins and folic acid supplementation for preventing neural tube defects (64,65). Moreover, pharmacists offered advice for breastfeeding or the selection of infant formula (66). Pharmacists encourage reproductive health impacts of contraception (67) or administration of vaccines to pregnant women (68).

Role of the community pharmacist in renal system diseases

The community pharmacist plays a positive role in chronic kidney disease (CKD) (69). The community pharmacists encourage medication safety, patient medical outcomes, and healthcare plan implementation. Community pharmacists direct medication profile review, identification of drug-related problems (DRPs), dose adjustment for chronic renal diseases, patient education, and collaboration with other healthcare providers. Via-Sosa et al. (2013) reported that community pharmacists used questionnaires for elderly patients with CKD, leading to a reduction in dosing after intervention (70). Similarly, Santschi et al. (2011) revealed that trained pharmacists offer advice for pre-dialysis clinic patients, mitigating blood pressure in CKD patients (71).

Role of the community pharmacist in bone diseases

The community pharmacist plays a positive role in bone diseases (2), include counselling on calcium and vitamin D intake, lifestyle modifications, and medication adherence for osteoporosis, with occasional referrals of at-risk patients to physicians (2), the importance hidden behind that are lack of public awareness about osteoporosis, limited pharmacist knowledge and confidence in osteoporosis management, time constraints for in-depth counseling (74,75). Moreover, the high cost of osteoporosis medications and the lack of authorised support for pharmacist-directed services demotivate involvement.

Role of the community pharmacist in thyroid diseases

The community pharmacist plays a positive role in thyroid diseases (76), including referral of patients with signs and symptoms of thyroid dysfunction (77). For diagnosed patients, the pharmacist's role entails monitoring the therapeutic plan to optimise response (78). For hypothyroidism, levothyroxine proper administration involves counselling, taking on an empty stomach, formulation consistency to avoid the narrow therapeutic index, and advising to avoid the drug-drug and drug-food interactions (79,80). For hyperthyroidism using antithyroid drugs (methimazole or propylthiouracil), counsel on dosing schedules, monitor for adverse effects (agranulocytosis and hepatotoxicity), and advise blood test time (81,82). Pharmacists' counsel also includes balanced nutrition and the use of supplements like vitamin D, while cautioning against overuse of iodine intake (83).

Role of the community pharmacist in sexual diseases

The community pharmacist plays a positive role in sexual and reproductive health (SRH) (84), including testing and advising on sexually transmitted infections (85–88), hormonal contraception (89,90), emergency contraception (91,92), and offering counselling for pregnancy (64). These services provided effective feasibility due to difficulties in accessibility and the long time required to reach a general practitioner (93,94).

Role of the community pharmacist for cancer patients

The community pharmacist plays a positive role in cancer patients, focusing on hospitalised patients (96), by offering patient home care, follow-up, and palliative therapy management. Pharmacists' interventions enhanced outpatients' symptom control, improved complex medication adherence and quality of life, and reduced hospitalisation (7,97). A common example in palliative care, the effectiveness of opioid therapy improved due to correct medication application and subsequent emotional counselling to patients and their families (98,99).

Role of the community pharmacist in patient care after surgery

Community pharmacists can impact postoperative care by directing the detailed medication understanding at discharge. Pharmacist-directed medication understanding decreases errors and enhances adherence to the treatment regimens, counteracting postoperative complications, such as, surgical site infections, venous thromboembolism, nausea, and vomiting (104–106), also pharmacist providing patient education on high-risk medications (e.g. anticoagulants, opioids, and antibiotics), encouraging the appropriate application, perhaps to avoid adverse effects, and enhance medication adherence to prescription instructions (107,108). Community pharmacists shared discharge plans and assisted follow-up of drug stewardship programs, to fulfil post-discharge medication (e.g. opioid safety, anticoagulation therapy, and glycemic control) (109–111).

Discussion

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The present review described the positive role of community pharmacy enabled to participate in enabling patients with their medication profile via counselling, education, real application to the patients, dose calculation, and risk explanation about pathology. Most of these conditions have benefited from the patients' education, leading to the realistic importance of participation of pharmacists in overall patient health.

In asthmatic patients, the improvement was related to the dramatic improvement of inhaler technique usage from 24% correct at baseline to 71% after six months. Also, pharmacists improved the patient referral to general practice and helped patients to properly implement action plans, since patients having action plans for their medication usage nearly tripled with the help of community pharmacy (8). In COPD patients, the pharmacists' plan was directed toward improvement of poor inhalation technique and medication adherence; hence, reducing medication error from 15.6% to 1.2%. These positive roles are linked to community pharmacists' accessibility and pharmacist expertise during prescription refills, leading to a 72% reduction of hospitalisation, which necessitates that daily management with pharmacists helps prevent acute deteriorations (11). In lung cancer, the pharmacist's role provided a comprehensive medication review to identify extreme-risk scenarios, to avoid interaction with newly added drugs to their list of therapy for new diseases. Tailored education directed toward the purposes behind taking medication improved medication adherence, because when they understand *why* they use these medications, they will probably not forget doses or discontinue them. The pharmacists prove for patients their role by focusing on improved daily symptoms: pain, nausea, constipation, insomnia, and fatigue, changing 46% of patients' feelings of betterment in these symptoms (12). In pediatric cystic fibrosis (CF), significant improvements via optimising aminoglycoside peak level enough to kill microorganisms without adverse effects based on therapeutic drug monitoring, reducing unnecessary blood draws and suboptimal dosing, and reducing the length of stay by three days at least (9 days with community pharmacy vs. 12 days without community pharmacy)(24).

Pharmacists ensure lifestyle modifications focusing on diet, exercise, and smoking cessation, leading to complication control. Pharmacists also clarify the drug, improving adherence for patients to be involved in their care, including proper use of glucometers. The pharmacist also supervised the newly prescribed medications for the diabetic patients to maintain therapeutic integrity and control adverse drug reactions, including, e.g., statins for CVD risk, ACE inhibitors/ARBs for nephropathy (35). The positive role of pharmacists in CVD is elucidated by being easily contacted healthcare providers for chronic disease management, permitting the screening for high-risk patients and timely referral, helping patients to understand the risk and encouraging their engagement in management. These positive outcomes are reflected by changes in the pharmacist's role in offering education on CV risk, diet, exercise, and smoking cessation (39).

Regarding CNS diseases, the pharmacists have a weak role in depression, perhaps due to the complexity of depression diseases, making adherence to therapy insufficient because pharmacists can't address important depression components of psychotherapy, lifestyle modifications, and comorbid mental health conditions. The studies on depression have follow-up duration for less than 6 months (versus 1–3 months required for initial effects), which is insufficient to observe the full efficacy of any changes in interventions (41). Pharmacists provided clear advice in terms of AD patients having other comorbidities requiring polypharmacy to treat associated cardiovascular diseases. Daily care and advice are essential for most AD patients and their caregivers, requiring psychological and emotional support (44), resulting in 48% reduced adverse drug reactions and 42% reduced drug interactions. However, the small sample size and uncentre-based study limit the generalizability of the data. Lack of measured clinical (length of hospital stay, cognitive measured scores), with some patients dropping out of seeking pharmacists' help. In PD patients, medication adherence is low due to required multiple medication (e.g., levodopa, dopamine agonists, COMT inhibitors) to optimize therapy, the discontinuation of one of these by patients is usually common leading therapy failure or dangerous side effects (e.g., dyskinesias, hallucinations), pharmacists involvement have reduced such problems by manage complex pharmacotherapy especially for characteristic critical drugs with narrow therapeutic window. These positive roles are achieved by Dosage Individualisation, repeated counselling, and multidisciplinary collaboration (45).

In patients with PUD, the pharmacists optimise the therapy verified via corrected irrational drug use, encourage adherence, and reduce medication-related issues. The roles accomplished by continuous review of health records and audits, counselling for lifestyle modifications, and management of symptom monitoring, reducing excessive acid-reduction therapy (51). In IBD patients, pharmacists educate the patients on disease pathogenesis, correct medication adherence, encourage patients for management during relapse, enhance the quality of life, and provide lifestyle modifications (54). In chronic liver diseases, pharmacists have a positive impact by routine liver screenings and referral to specialists because most liver diseases are asymptomatic and the diagnosis requires biopsy and imaging (56).

Pregnant and breastfeeding women struggle with some symptoms, e.g., nausea, vomiting, and headaches. Pharmacists work as medication specialists for OTC products, recommend vitamins and nutritional supplements, provide contraception advice and aid family planning. Moreover, pharmacists offered lifestyle changes and exercise for postpartum. In breastfeeding, pharmacists provide recommendations for safe drug use, taking into consideration that up to 50% of pharmacists argued that OTC drugs are safe in pregnancy, carrying caution and potential knowledge limitations. Referral of medical conditions, e.g., diarrhoea, vaginal itching, mastitis, and haemorrhoids (61–63).

Clinical pharmacists take care of chronic kidney disease patients in a multidisciplinary aspect, showing a positive impact on outcomes; via offering medication management, mitigating DRPs, improving clinical parameters, neutralising healthcare costs, and supporting patient-centred care (69). Osteoporosis is an area of interest for the positive impact of clinical pharmacists providing training plans, public awareness campaigns, and policy restructuring (2).

Pharmacists improved thyroid hormone dysregulation by assisting as educators, medication experts, adherence initiators, and safety invigilators, making stability of thyroid function, mitigating complications, and improving quality of life for patients (76). Pharmacists increasingly improved sexual health outcomes by adding sexual and reproductive health services to their work, such as initiatives, counselling, and screening provision. provide services without fear, breaches in privacy with delivering sexual and reproductive health services confidently and competently (84). Based on our findings, we suggest that further investigation of community pharmacists' interventions into oncology outpatient assistance is necessary, and that further research should be conducted to address this need(84). Oncology and surgery required continuous medication revision for inpatients and providing counselling for preoperative patient preparation and for management of oncological cases and conditions (96,106)

Conclusion

Network pharmacy-led strategies have improved drug compliance and illness management; the interventions reviewed in this study showed positive effects on blood pressure control, regulation of asthma, COPD, and cholesterol. The results, however, did not demonstrate any appreciable impact on depressive symptoms. The majority of interventions involved in-person interactions and included educational elements aimed at enhancing patients' understanding of their medications or health conditions. Although the available literature supports the effectiveness of educational interventions in community settings, their impact on depressive symptom control was not evident in this review. It is important to explore the role of other intervention components as well. Future studies should concentrate on discovering the elements that have the greatest influence on improving adherence and health outcomes among patients with varied medical problems.

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Table 1. Summary of the impact analysis of the intervention of community pharmacists in enhancing patient medication

| Study | Design & Population | Intervention | Evaluation parameters | Primary Outcomes | Key Secondary Outcomes |
|--|---|--|---|---|---|
| Armour et al., (2007) Respiratory system | Randomised controlled trial | Proper use of spirometry and inhaler | Questionnaires only | Control of Asthma Severity | Improved inhaler use and a significant change in spirometry |
| Nyamazana et al., (2020) Diabetes mellitus | Pharmacist-involvement studies | Pharmacist-Led Interventions | Usual care | Improved glycaemic control; enhanced adherence | Reduced complications; improved quality of life |
| Motlohi et al. (2023) Cardiovascular diseases | Observational | Therapeutic drug monitoring, lifestyle counselling, and health education | Usual care | Clinical parameters (e.g., BP, blood sugar), medication adherence | Patient satisfaction, quality of life, and healthcare utilisation |
| | Randomised controlled trial | Pharmacist-led CVD risk screening, counselling, and follow-up | Usual care | Reduction in CVD risk parameters and hospital stays | Patient-reported outcomes, satisfaction, economic impact |
| | Quasi-Experimental | Structured pharmacist interventions (e.g., education, monitoring) | Pre-intervention data or control group | Changes in clinical parameters, adherence to therapy | Patient perceptions, acceptability of services, and cost-effectiveness |
| Al-Jumah & Qureshi (2012) Depression | Randomized controlled | patient education and counseling | Usual care | Adherence weakly improved | Clinic visit frequency |
| Carcak Yilmaz et al. (2017), Alzheimer's disease | Cross-sectional survey | drug usage information | Analysis based on the caregiver | Caregiver utilization of pharmacist services | Psychological support acceptance |
| KhobraniM & Alshahrani SM (2025), Bipolar disorder | Prospective randomised controlled study | Pharmacist–psychiatrist collaborative patient education sessions | Usual psychiatric care | Increased Medication Adherence | Improved Quality of Life |
| Sapkota et al. (2025) Peptic ulcer disease | Case-control | Pharmacist-led education on the use of the proton-pump inhibitors | Usual care | Rational use of proton-pump inhibitors | Cost reduction |
| Syed-Abdul (2023), Liver diseases | Conceptual proposal | Risk Identification | Different studies | Increased rate of correct referrals | Improved patient lifestyle |
| Ayele et al. (2020) Women's health | Systematic review | Vitamin supplementation advice | Observational and qualitative studies | Pharmacists improve care services | Improved patient attitudes |
| Via-Sosa et al. (2013) Chronic kidney disease | Observational, cross-sectional | Community pharmacist-led drug dosing adjustment service | Control group | Reduced dosing inadequacy | Reduced drug-related problems |
| Nik et al., (2016) Bone diseases | Intervention | osteoporosis counseling | exploratory | Identification of barriers and facilitators to osteoporosis management services | Pharmacists' perceived scope of practice |
| Homšek et al., (2022) Thyroid diseases | Educational study | Pharmacist-provided pharmaceutical care | standard roles and recommendations | Early detection and referral of thyroid disorders. | Reduction in medication errors and drug-related problems. |
| Navarrete et al. (2020) Sexual and reproductive health | Scoping review studies | Professional pharmacy services in sexual and reproductive health | compared findings across studies and settings. | Feasibility, acceptability, and reach of services. | User satisfaction and experiences. |
| Yeoh et al., (2013) Cancer patients | Prospective observational study | Pharmacist-led medication management | pre-service vs. post-service comparison | Patient satisfaction with service (pre- and post-survey). | Patient-reported understanding of medications, side effects, and therapy goals. |
| Zheng et al. (2022) Postoperative care | Observational/descriptive | Pharmacist-led medication reconciliation | Control group without medication reconciliation | Length of stay for the first stage of the two-stage | Patient satisfaction |

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