TPM Vol. 32, No. S3, 2025
ISSN: 1972-6325
https://www.tpmap.org/

INVESTIGATING THE IMPACT OF PHARMACIST-LED INTERVENTIONS ON MEDICATION ADHERENCE

[1]PRACHI GURUDIWAN, [2]LUKESHWARI SAHU, [3]NIKHIL SINGH
[1]ASSISTANT PROFESSOR, DEPARTMENT OF PHARMACY, KALINGA UNIVERSITY, RAIPUR, INDIA.
ku.prachigurudiwan@kalingauniversity.ac.in,0009-0008-0150-5250
[2]ASSISTANT PROFESSOR, DEPARTMENT OF PHARMACY, KALINGA UNIVERSITY, RAIPUR, INDIA.
ku.lukeshwarisahu@kalingauniversity.ac.in,0009-0002-3045-6538
[3]ASSISTANT PROFESSOR, NEW DELHI INSTITUTE OF MANAGEMENT, NEW DELHI, INDIA.,
E-mail: nikhil@ndimdelhi.org, https://orcid.org/0009-0002-7051-7569

Abstract
A scoping review of the effects of pharmacist-led interventions on clinical outcomes and medication adherence among patients with hyperlipidaemia and hypertension was conducted using pre-defined search terms in three scientific databases (Google Scholar, ScienceDirect, and PubMed) and a multi-step screening process based on relevance, publication year (2009–2019), English language, and article type (original research). After excluding review articles, meta-analysis papers, and conference proceedings, data charting was done iteratively using an extraction form tailored to each study. Eleven trials reported statistically substantial ($P<0.05$) effects on drug adherence. Although they were less commonly linked to the achievement of clinical outcomes, pharmacist-led interventions were linked to better medication adherence among patients. Although in-person counselling was the most often utilized intervention, multiple therapies most likely had greater impact in raising overall outcome markers.
Keywords: hyperlipidaemia, considered relevancy, targeted interventions

1. INTRODUCTION

It is estimated that by 2030, CVD will claim the lives of almost 23.6 million individuals. Smoking tobacco, having high blood pressure, high blood cholesterol, not exercising, eating badly, and being fat are risk factors that can be altered[1]. Non-modifiable risk variables include age, gender, socioeconomic status, and family history of CVD [2]. Additional lifestyle changes are just as important in preventing recurrent cardiovascular events as evidence-based pharmacotherapies for preventing the risk of CVD. Anti-hypertensives, antiplatelet medicines, and statins are typical examples of important cardiovascular treatments[11]. Despite their frequent interchangeability, adherence and compliance seem to have different motivational statuses, with adherence indicating more active patient participation with medical experts' recommendations. It has been unfortunate that nonadherence with cardiovascular medications is an enormous issue that results in treatment failure and adverse clinical outcomes [3].

Among other medical specialists, pharmacists are the most approachable members of the healthcare team. The pharmacist's responsibilities now include counseling patients on lifestyle modifications, managing drug therapy, managing disease states, and ensuring optimal medication adherence, in addition to the traditional distribution of medications [12]. According to the International Pharmaceutical Federation's 2019 policy statement on pharmacists' contributions. The kind and efficacy of pharmacists' interventions to enhance hypertensive and hyperlipidemic patients' adherence to their prescription regimens, however, are not well understood [4]. Thus, this study's goal was to categorize the different kinds of pharmacist interventions according to how they impacted patients' medication adherence [16]. Included were original, peer-reviewed studies conducted between 2009 and 2019 that looked at how pharmacist assistance affected medication adherence. To provide an overview of the most recent published evidence, the searches were limited to the last ten years. Book chapters, review papers, conference proceedings, and meta-analysis studies were excluded. At this point, the included publications were selected independently by two reviewers (ME and NR) using the previously specified inclusion criteria. Three meetings were held at the start, middle, and end of the selection process in accordance with the chosen methodological framework. In order to resolve any disputes or problems that arose throughout the study selection process, the two independent reviewers also met often.

2. REVIEW OF LITERATURE

Data graphing was done iteratively using an extraction form tailored to the study and the research issue. Data was taken from the first five trials by two different researchers. The consistency level of the data extraction in relation to the study-specific extraction form was then discussed at a conference that was set up [5]. As the landscape of the healthcare system changes throughout time, so does the practice of pharmacists. By applying their expertise in pharmaceutical and medical sciences, pharmacists have been the defenders of medicine use that is both safe and efficient. As part of their limited clinical healthcare service function, they were previously primarily involved in putting complex scientific knowledge about medications into practice.

Both the advanced understanding of cancer treatment and the abilities of general clinical pharmacy services are possessed by oncology pharmacists. As a result, they are essential in guaranteeing the efficacy, safety, and appropriateness of the treatment as well as the patients' increased understanding and compliance with it [6]. Pharmacist-led interventions for cancer patients enhanced patient safety and health outcomes by preventing and containing MRPs, according to a recent systematic review8 that included 27 interventional and 38 descriptive trials, the majority of which were carried out in industrialized nations. According to previous research, oncology pharmacists may assist with the following tasks: identifying and correcting erroneous medications, untreated indications, inappropriate administration, sub-therapeutic dose, drug interactions, overdose, omission of administration, and unpleasant consequences. They greatly enhanced the outcome, hospital stay, care quality, and patient happiness by doing this [13].

Although many systematic reviews have been conducted to assess the overall impact of this method on patient care, no research has been done on the meta-analysis of the impact of "pharmacists-led intervention" on resolving MRPs among cancer patients undergoing treatment. This systematic review and meta-analysis of randomized control trials (RCTs) was carried out to examine how pharmacist interventions can help patients receiving cancer treatment address both general MRPs and specific MRPs like medication errors, adherence, and adverse drug events (ADEs). For better cancer care and treatment results, this could assist international organizations and governments in developing and enhancing these programs.

3. MATERIALS AND METHODS

Previous research emphasized that improvements in the prudent use of medications for hyperlipidaemia were associated with pharmacist interventions. About 65% of the trials that were analysed here showed that pharmacist interventions had a substantial impact on patients' drug compliance. As a secondary outcome metric, medication adherence was being assessed in three studies [7]. Following the pharmacists' assistance, two of them showed no discernible change in adherence. The total success rate of pharmacists' efforts to increase medication adherence was 60% for telephone interventions, 62.5% for in-person counselling, and 75% for comprehensive treatments. These results showed that the greatest potential for enhancing medication compliance was seen when pharmacists were directly involved in multidimensional care models that included a multidisciplinary collaboration component. Both medications were used in the last four investigations [8]. It should be noted that the adherence outcome measures significantly improved in nearly all of the studies that compared the two drugs [14]. Five out of eight trials that specifically focused on enhancing the outcome measures of adherence for antihypertensive drugs also produced noteworthy findings[10]. Lastly, the pharmacist interventions had a beneficial effect in only two of the five trials that sought to improve adherence to lipid-lowering treatment. Research that assessed the strategy's overall favourable impact on medication compliance found that the intervention considerably improved measures of adherence to antihypertensive medication more than lipid-lowering therapy did[9].

Twelve studies evaluated the impact of pharmacist treatments on clinical outcomes, such as hypertension and hyperlipidemia. Assessing the impact of pharmacist interventions on the clinical outcome of regulated blood pressure or achieving the target LDL-C level was the primary objective of four of these trials. Pharmacist interventions were proven to improve clinical outcomes in just three trials, two of which were multidimensional. Interestingly, those trials had a significant impact on medication adherence but were less likely to have a meaningful impact on clinical outcomes when evaluating combined outcome measures for lipid-lowering and antihypertensive therapy. To measure the degree of patient adherence, the majority of the included studies used pharmacy-refill records as either the proportion of days covered (PDC) or the medication possession ratio (MPR). By dividing the total number of days of pharmaceutical supply during the observation period by the total number of days during the observation period, MPR calculates drug adherence. In order to calculate the covered days, PDC divides the total number of days provided by the study period number by the ratio of days covered over the 360 days after the index date. Self-reporting, objective, quantitative metrics are used in both approaches. Adherence was defined differently in each trial, though; some defined it as MPR $\geq$ 90%, while others defined it

as adherence = MPR ≥ 80%. Because of its simplicity, affordability, and accessibility of use, this self-reporting assessment instrument has been widely used to quantify adherence to antihypertensive drugs. The overestimation of the degree of adherence caused by the self-reporting is one of the assessment tool's shortcomings.

4. RESULT AND DISCUSSION

The gathered data underwent a descriptive analysis. Key findings were reported in accordance with research outcome measures [15]. The lipid profile, which included both total and LDL cholesterol, was the clinical outcome assessed for hyperlipidemia..

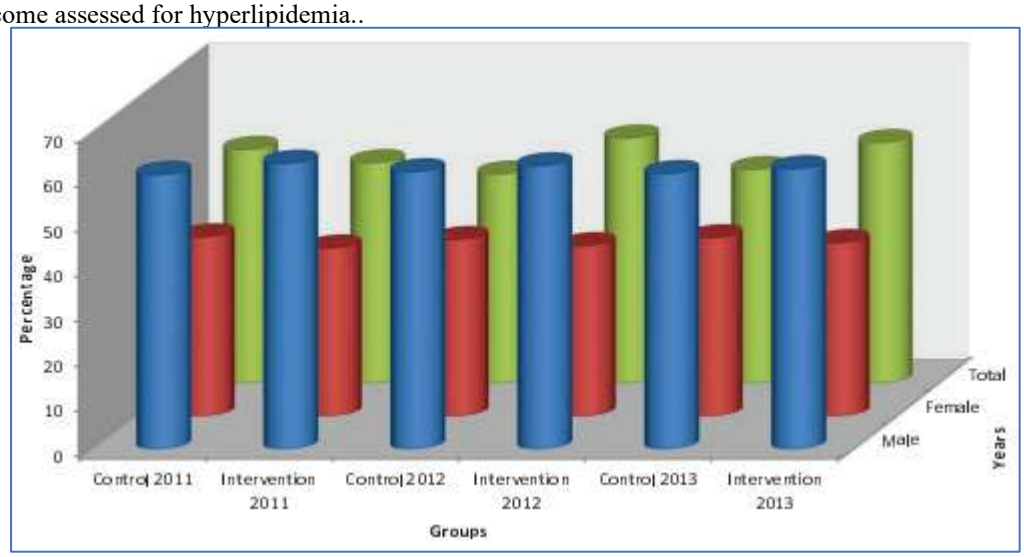

Figure 1: medication adherence in patients

A synopsis of the primary forms of pharmacist interventions, medication adherence measurement techniques, and their effects on patient adherence was given. Pharmacists' interventions were described and categorized into two groups according to how much they enhanced medication adherence. research in which there was a statistically significant (P<0.05) or non-significant (P>0.05) improvement in medication adherenc.

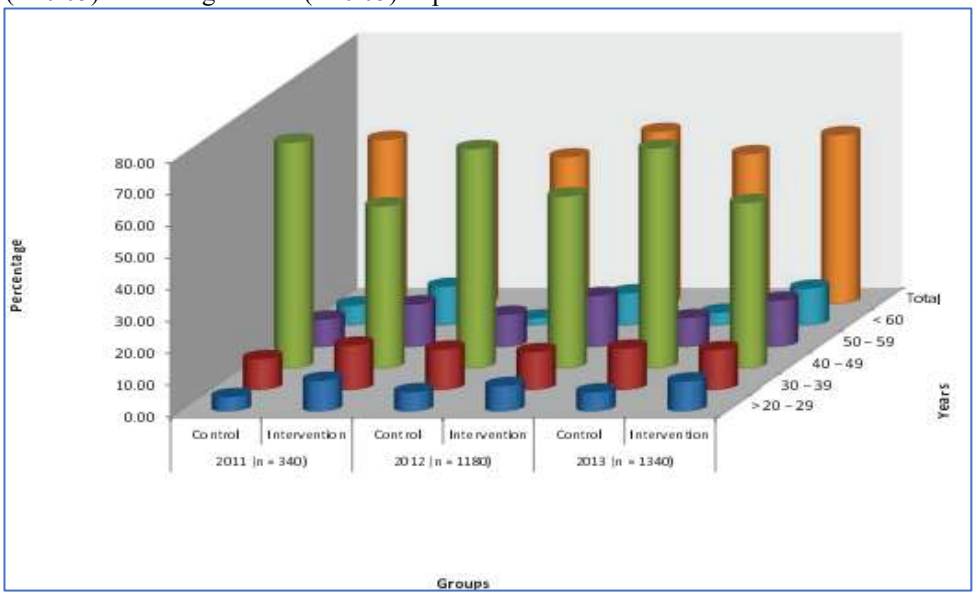

Figure 2:pharmacist-led interventions

Five trials examined adherence to high-cholesterol drugs, while eight examined the effect of pharmacist interventions on adherence to antihypertensive medications. Medication adherence for hypertension and hyperlipidaemia was evaluated in the last four studies.

Three trials included telephone-designed treatments or remote reminders, while three studies employed a comprehensive pharmacist intervention. Two telephone-based therapy, one multimodal intervention, and three in-person counselling sessions all shown non-significant increases in medication adherence.

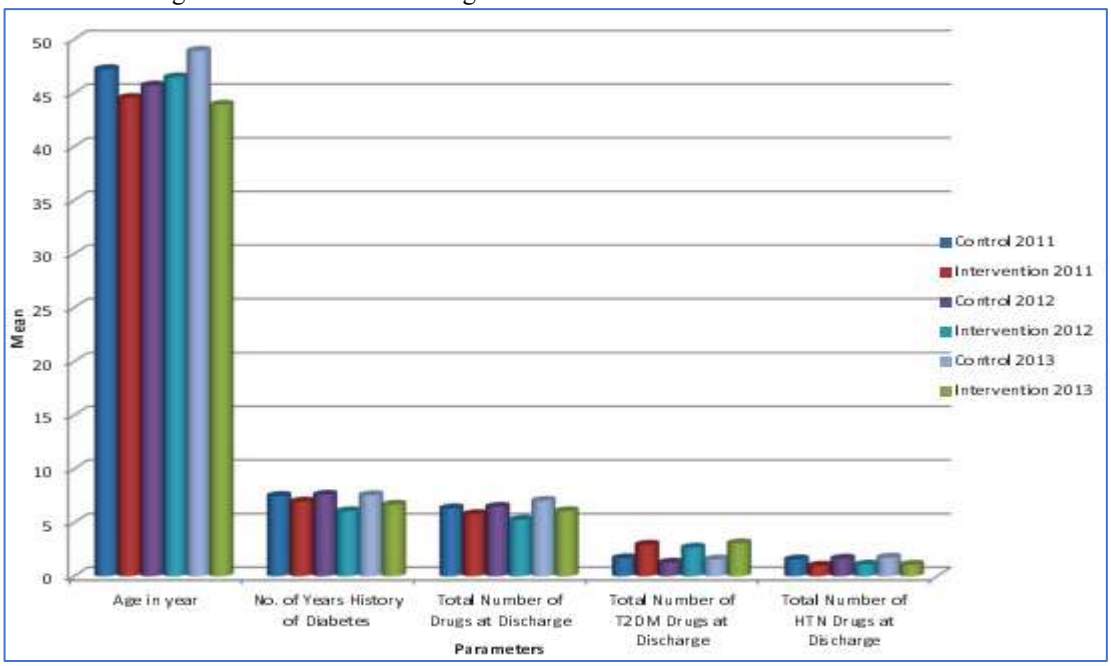

Figure 3:cost-effectiveness of pharmacist-led interventions

Only one of these studies included lipid-lowering therapy, whereas the other three involved antihypertensive drugs. Disparities in the intervention's design and style, control group, primary and secondary endpoint selection, and adherence measurement tools seem to have an effect on the study's findings.

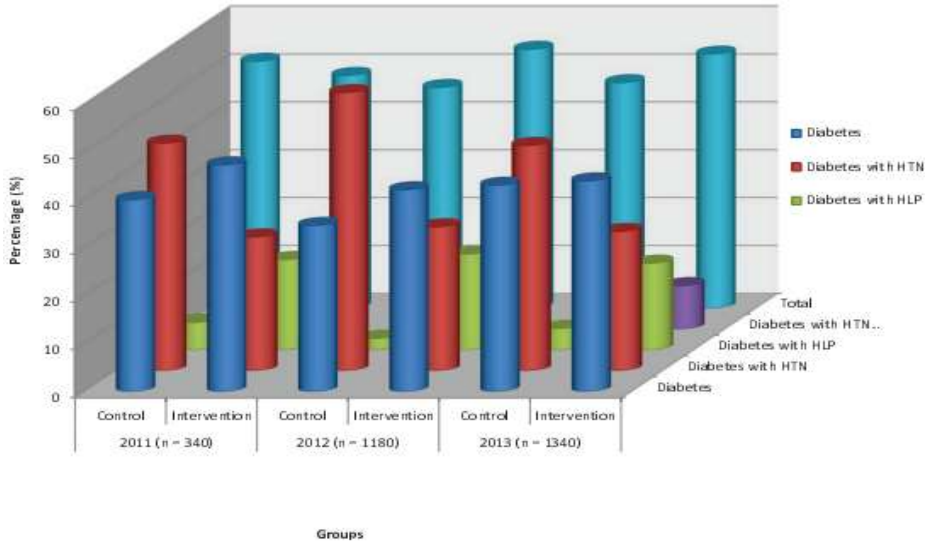

Figure 4: patient satisfaction and quality of life

Following the evaluation of medication adherence as primary outcomes, the majority of the studies examined clinical outcomes as secondary results. It was difficult to look at the relationship between adherence and clinical results because some studies did not measure clinical outcomes.

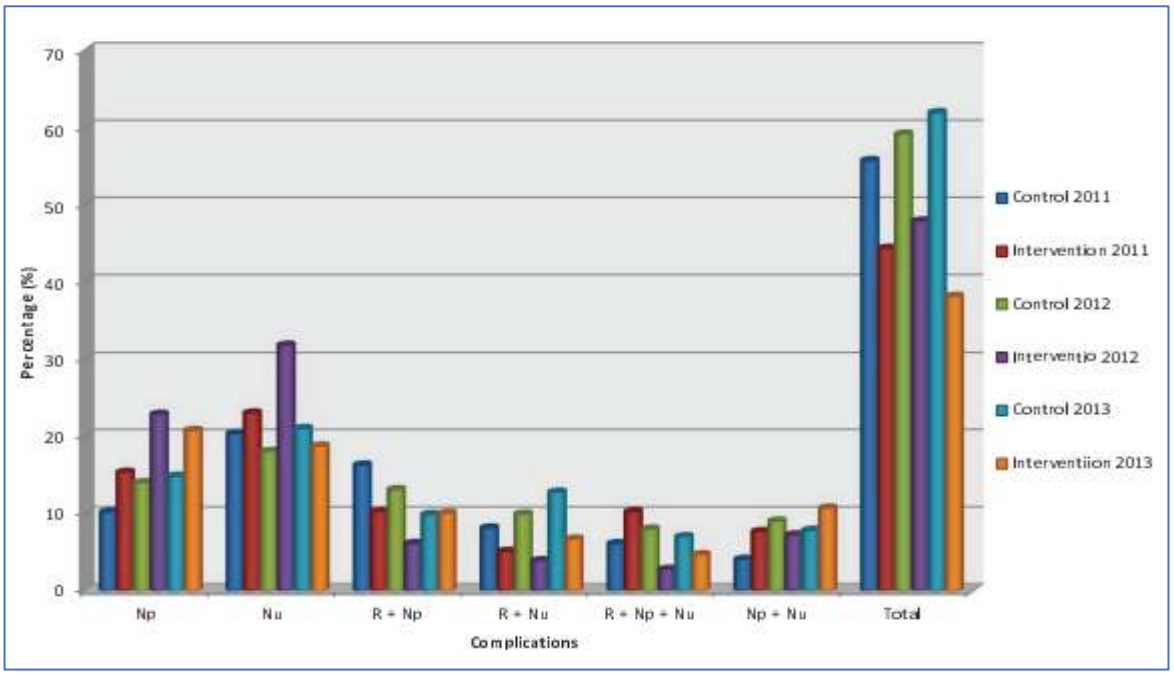

Figure 6:characteristics of patients

According to the study's findings, treatments that included multiple subsequent components, frequent follow-ups, and a range of written and vocal materials had a higher chance of producing favourable results. Since more structured multicomponent interventions have a higher chance of achieving ideal adherence levels, future research including pharmacists' interventions should incorporate regular patient contact.

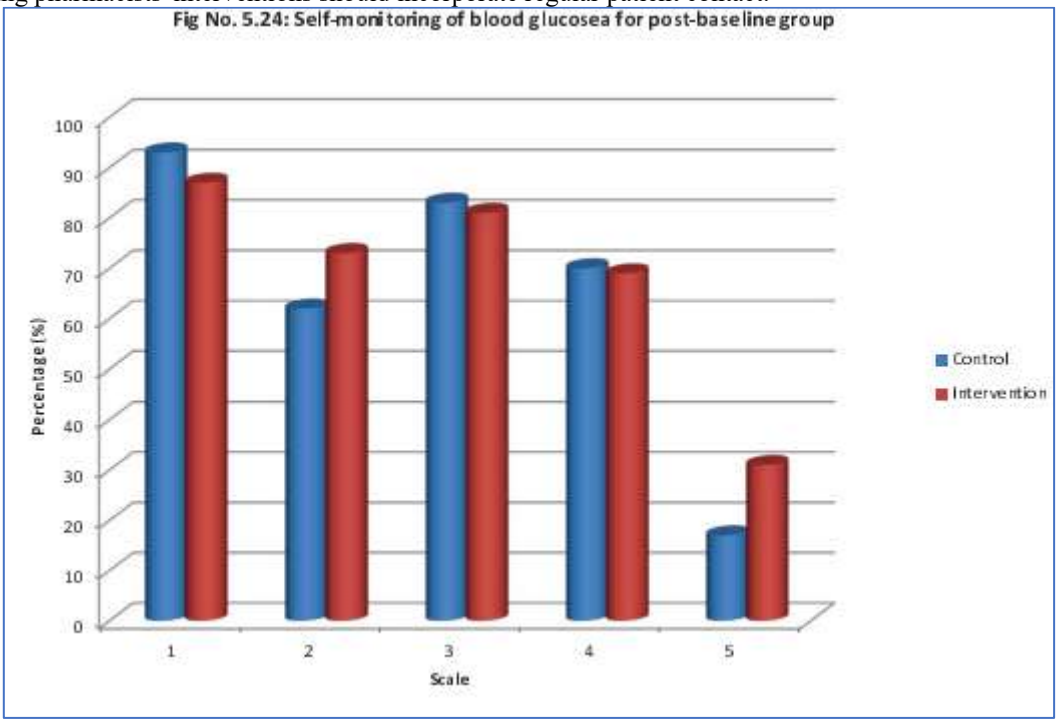

Figure 7: benefit from pharmacist-led interventions

Therefore, in order to maximize the use of the available financial and human resources. Additionally, it would be crucial to look into the characteristics of each patient, such as gender, as these could have an impact on the overall results of the interventions that are carried out.

5. CONCLUSION

There are several restrictions on the study. The included studies' quality was not evaluated. Three databases were the only ones searched, which might have limited the number of eligible research that could have been found in other pertinent databases. Additionally, publication bias is likely because our investigation was limited to only including published literature. Therefore, one may argue that many of the included research did not necessarily provide positive outcomes. In any case, the research was determined using a broad, open, and methodical approach. Pharmacists' office-to-office counselling was the most popular strategy; nevertheless, multi-component interventions were more likely to improve the overall outcome measures. The success of targeted therapy may be increased by meticulous planning that takes into account patient characteristics, additional follow-ups, and better care for the included medications.

REFERENCES

1. Calleja, Luke, Beverley D. Glass, Alice Cairns, and Selina Taylor. "Pharmacist-Led Interventions for Medication Adherence in Patients with Chronic Kidney Disease: A Scoping Review." Pharmacy 11, no. 6 (2023): 185.
2. Otieno, J., & Wanjiru, G. (2024). Seismic Innovations: Strengthening Tall Buildings with Advanced Earthquake-Resistant Technologies. Association Journal of Interdisciplinary Technics in Engineering Mechanics, 2(3), 18-21.
3. Nguyen, Thang, Thao H. Nguyen, Phu T. Nguyen, Ha T. Tran, Ngoc V. Nguyen, Hoa Q. Nguyen, Ban N. Ha, Tam T. Pham, and Katja Taxis. "Pharmacist-led intervention to enhance medication adherence in patients with acute coronary syndrome in Vietnam: a randomized controlled trial." Frontiers in Pharmacology 9 (2018): 656.
4. Basanta Kumar, R., & Sunil, K. (2024). Biotechnological Approaches to Develop Personalized Medicines for Rare Genetic Disorders. Clinical Journal for Medicine, Health and Pharmacy, 2(2), 20-28.
5. Erku, Daniel A., Asnakew A. Ayele, Abebe B. Mekuria, Sewunet A. Belachew, Bisrat Hailemeskel, and Henok G. Tegegn. "The impact of pharmacist-led medication therapy management on medication adherence in patients with type 2 diabetes mellitus: a randomized controlled study." Pharmacy Practice (Granada) 15, no. 3 (2017).
6. Sharma, R., & Maurya, S. (2024). A Sustainable Digital Transformation and Management of Small and Medium Enterprises through Green Enterprise Architecture. Global Perspectives in Management, 2(1), 33-43.
7. Al-Arkee, Sheelan, and Omar Al-Ani. "Community pharmacist-led interventions to improve medication adherence in patients with cardiovascular disease: a systematic review of randomised controlled trials." International Journal of Pharmacy Practice 31, no. 3 (2023): 269-275.
8. Jaiswal, H., & Pradhan, S. (2023). The Economic Significance of Ecosystem Services in Urban Areas for Developing Nations. Aquatic Ecosystems and Environmental Frontiers, 1(1), 1-5.
9. Abdulsalim, Suhaj, Mazhuvancherry Kesavan Unnikrishnan, Mohan K. Manu, Alian A. Alrasheedy, Brian Godman, and Donald E. Morisky. "Structured pharmacist-led intervention programme to improve medication adherence in COPD patients: a randomized controlled study." Research in Social and Administrative Pharmacy 14, no. 10 (2018): 909-914.
10. Ghosh, A., & Chatterjee, V. (2023). Electrocoagulation-Assisted Filtration for the Removal of Emerging Pollutants in Wastewater. Engineering Perspectives in Filtration and Separation, 1(1), 5-8.
11. Wang, Lingjiao, Yuanyuan Zhao, Liping Han, Huan Zhang, Hejun Chen, Aixia Liu, Jing Yu et al. "Pharmacist-Led Management Model and Medication Adherence Among Patients With Chronic Heart Failure: A Randomized Clinical Trial." JAMA Network Open 7, no. 12 (2024): e2453976-e2453976.
12. Fairfax, J., & Sørensen, A. (2024). Integrating Telemedicine and Pharmacists in Chronic Gastrointestinal Diseases: A Critical Role During the COVID-19 Pandemic. Global Journal of Medical Terminology Research and Informatics, 1(1), 23-29.
13. Butt, Mubashra, Adliah Mhd Ali, Mohd Makmor Bakry, and Norlaila Mustafa. "Impact of a pharmacist led diabetes mellitus intervention on HbA1c, medication adherence and quality of life: A randomised controlled study." Saudi pharmaceutical journal 24, no. 1 (2016): 40-48.
14. Jia, Xiaona, Shuang Zhou, Daohuang Luo, Xia Zhao, Ying Zhou, and Yi-min Cui. "Effect of pharmacist-led interventions on medication adherence and inhalation technique in adult patients with asthma or COPD: a systematic review and meta-analysis." Journal of clinical pharmacy and therapeutics 45, no. 5 (2020): 904-917.

15. Elnaem, Mohamed Hassan, Nor Fatin Farahin Rosley, Abdullah A. Alhifany, Mahmoud E. Elrggal, and Ejaz Cheema. "Impact of pharmacist-led interventions on medication adherence and clinical outcomes in patients with hypertension and hyperlipidemia: a scoping review of published literature." Journal of Multidisciplinary Healthcare (2020): 635-645.
16. Presley, Bobby, Wim Groot, and Milena Pavlova. "Pharmacy-led interventions to improve medication adherence among adults with diabetes: a systematic review and meta-analysis." Research in Social and Administrative Pharmacy 15, no. 9 (2019): 1057-1067.
17. Surendar, A. (2025). Coordinated Control of Bidirectional EV Chargers for Grid Stability in High-Density Urban Networks. National Journal of Intelligent Power Systems and Technology, 1(1), 1-11.
18. Madhanraj. (2025).AI-Powered Energy Forecasting Models for Smart Grid-Integrated Solar and Wind Systems.National Journal of Renewable Energy Systems and Innovation, 1-7.
19. Arvinth, N. (2025). Design and Optimization of Ultra-Efficient Brushless DC Drives for Home Appliances. National Journal of Electric Drives and Control Systems, 1-11.
20. Kavitha, M. (2025). Design and Optimization of High-Speed Synchronous Reluctance Machines for Industrial Drives. National Journal of Electrical Machines & Power Conversion, 1-10.
21. Karthika, J. (2025). Power Converter Design for Next-Generation Wind Energy Systems Using GAN Devices. Transactions on Power Electronics and Renewable Energy Systems, 1-12.
22. Kavitha, M. (2025). AI-Driven Battery State-of-Health Estimation Using Real-Time Electrochemical Data. Transactions on Energy Storage Systems and Innovation, 1(1), 1-8.
23. Unciano, N. (2025). AI-augmented metasurface-aided THz communication: A comprehensive survey and future research directions. Electronics, Communications, and Computing Summit, 3(2), 1–9.