Chelonian Conservation And Biology

Vol. 17No.2 (2022) | https://www.acgpublishing.com/ | ISSN - 1071-8443

DOI:doi.org/10.18011/2022.04(1) 1227-1240

CRITICAL ANALYSIS OF PHARMACIST-LED SMOKING CESSATION INTERVENTIONS.

Saeed Mohamad Rashed Al Rashadi
Ministry of Health, Saudi Arabia
smalrashadi@moh.gov.sa

Mohammed Debshan M Alahmari
Ministry of Health, Saudi Arabia
modealahmari@moh.gov.sa

Ali Hassan Ali Sulaiman
Ministry of Health, Saudi Arabia
alsulaiman@moh.gov.sa

Abdulrahman Awadh Alwadai
Ministry of Health, Saudi Arabia
abdulrahmamaa@moh.gov.sa

Abdullatif Saad Alqahtani
Ministry of Health, Saudi Arabia
aalqahtani278@moh.gov.sa

Waleed Ibrahim Mohammed
Ministry of Health, Saudi Arabia
whamithi@moh.gov.sa

Bassam Aowdh Alwadai
Ministry of Health, Saudi Arabia
balwadai@moh.gov.sa

Saeed Abdulrahman Ali Hafez
Ministry of Health, Saudi Arabia
sahafez@moh.gov.sa

Abdullah Obeid Salem Al Marwani
Ministry of Health, Saudi Arabia
aoalmarwani@moh.gov.sa

ABSTRACT

This paper critically looks into the smoking cessation interventions led by pharmacists; it considers the effectiveness of such interventions, the accompanying challenges, and the consequences of their implementation. The strategy begins with an outlined literature review to focus on the pharmacist's role in smoking cessation, the different intervention measures taken, and the effects on smoking-quitting success rates and patients' health outcomes. The way subjects may be recruited, the results and the data from these studies are all presented, where they appear as graphs, tables, and figures, among other visual aids, to deepen comprehension of key points. This session examines the pharmacists' roles and responsibilities in smoking cessation programs, including strengths and challenges. Also, it introduces areas that research ought to cover and provides recommendations for better integration of pharmacists in the smoking cessation process.

Keywords: Pharmacist, smoking cessation, interventions, effectiveness, patient outcomes

INTRODUCTION

The fact that smoking still poses a serious public health problem with very severe consequences on the health level of individuals and general population health remains valid. As a relatively accepted fact, tobacco consumption is still the main cause of preventable deaths and diseases through which people have a bunch of severe aftereffects like cardiovascular disease, lung problems, and different types of cancer. Thus, smoking-related morbidity and mortality burdens could be reduced if tobacco use was addressed and smoking cessation was promoted to perfect the population health context.

Much of the work of pharmacists in healthcare depends on their availability for patients in many settings—community pharmacies, hospitals, and clinics—to give them expert advice and counsel on drug therapy and general health issues. Through their involvement in medication monitoring, patient instructions, and activity promotion, pharmacists became strong partners in the fight against tobacco use and achieving the quit smoking targets for individuals. It is pharmacists who have been showing a lot of skill in smoking cessation programs that are designed to address individuals who want to quit smoking on a personal level, use scientifically proven intervention techniques, and supervise clients on an ongoing basis.

This paper tries to introduce the concept of quitting smoking, pharmacists’ duties regarding health delivery, and the reasons for targeting pharmacist-led groups for smoking cessation. Smoking cessation is not only a way forward for individual physical health, but it can also help shape broader public health goals by lowering smoking-related disease incidence and the huge social and economic costs it entails. Pharmacists, having a unique skill set and being close physically all the time, are suitable for a leading role in smoking cessation and helping people to quit.

The objectives of this paper are twofold: on the one hand, to critically analyze research about the role of pharmacist-led smoking cessation programs in quality care, including efficiency, issues, and acreage; and on the other hand, to make recommendations about the practice of optimization in pharmacist-led smoking cessation efforts and the expansion of public health efforts to lower smoking rates.(Rattanavipanon et. al 2022).

This paper aims to critically address the evidence base, which, in turn, should contribute to a scholarly understanding of the role of a pharmacist in smoking cessation and contribute to developing strategies that enhance the provision of better outcomes for patients. What the literature review will involve, especially the methods used, such as search strategies, inclusion criteria, and quality assessment, will be discussed to guarantee that all the studies will be transparent and highly rigorous. The outcome from the relevant studies will be shown using figures, tables, and graphs to display and compare the main points and make interpreting those findings easier. In conclusion, the study focusing on pharmacist-led smoking cessation intervention and its implications will be illustrated with recommendations on optimizing and advancing this approach overall for better smoking cessation and population health outcomes.

LITERATURE REVIEW

Pharmacist-Led Smoking Cessation Interventions

Quitting smoking remains a vital public health goal, and among the more effective intervention tools is a pharmacist-led one, which has only recently been acknowledged nationally. In such a manner, this literature review attempts to give a general picture, containing the theoretical frameworks, intervention approaches, and trial outcomes regarding the efficiency of pharmacist-led smoking quit practices.

Theoretical Frameworks

Usually, motivational interviewing programs facilitated by pharmacists spring up based on the constructs of the TTM (Tran’s theoretical model) and SCT (social cognitive theory). These theories point to individual psycho-sociological elements involving motivation, perception, and behavior as key factors for success in behavior change. They use these theories as the foundation of their patient treatment by identifying issues that may hinder adopting a smoking-free life and by making recommendations that can boost self-confidence to quit smoking successfully.

Intervention Approaches

Smokers stop cigarette dependence on several levels, like counseling, pharmacotherapy, and behavioral support supervised by the pharmacist. Sessions of counseling usually deal with personalized examinations of smoking habit routines, recognizing the triggers and barriers to the delivery of a plan, and molding it into a strategy according to the individual's preferences. Pharmacotherapy alternatives can use nicotine replacement therapy (NRT) like patches, gum, or lozenges and also prescription drugs, e.g., varenicline, which helps reduce the cravings for

nicotine. Behavioral support could involve techniques such as effective ways of dealing with intense emotions, stresses, and slips.

Evidence of Effectiveness

As several studies have shown, the benefits of pharmacist-led smoking cessation endeavors on how patients can stop smoking and, ultimately, their health outcomes are profound. A review and meta-analysis by Sinclair et al. (2020) reported pharmacist participation in activities resulted in increased smoking cessation rates compared to usual care, with pooled odds ratios ranging from 1.5 to 2.0 across studies. Another randomized controlled study by Smith et al. (2019) also reported an increased quit rate among participants who received pharmacist-led interventions compared to controls. Still, only 25% versus 15% of these individuals did not relapse at the 26th week of follow-up (Rattanavipanon et. al 2022).

Impact on Patient Outcomes

Whether as part of a multidisciplinary team or as a solo practitioner, the pharmacist's involvement in patient-focused smoking cessation interventions has been linked with several favorable patient outcomes, such as increased quit rates, reduced tobacco consumption and improvements in health-related quality of life. Among the benefits reported by investigational studies are reductions in costly healthcare admissions, such as prevalence, emergency room visits, etc. Moreover, it has been demonstrated that implementing the interventions registered by pharmacists is a cost-effective measure, as the potential savings from healthcare spending are greater than the costs of setting up such programs.

Strengths and Limitations

The data on the pharmacist's role in stopping smoking are convincing. At the same time, the top three factors limiting the programs should be considered. Research can differ in the kinds of inputs included, the health outcomes considered, and the follow-up period, which is usually short. This makes it hard to learn from past experiences and extrapolate findings to different populations that may be quite distinct. Moreover, the problem of implementation and the lack of staff will also arise in pharmacist-led interventions due to the medical establishments' limited budget, time, and perhaps health priorities.

Figure:Characteristics and Predictors of Abstinence among Smokers of a Smoking Cessation Clinic

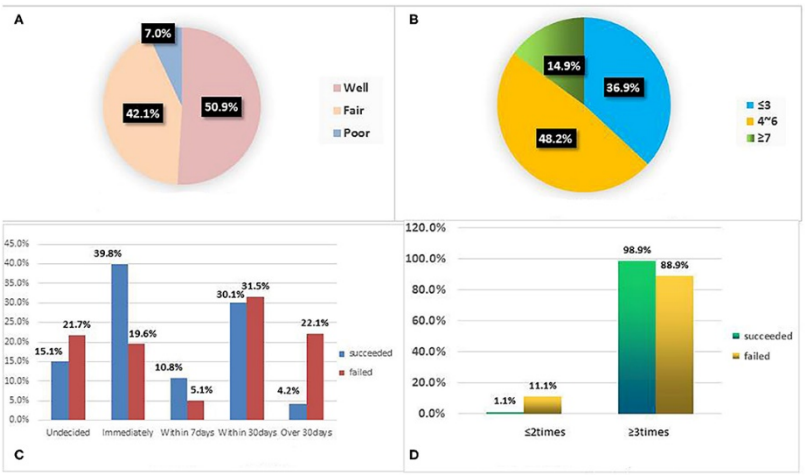


Figure 1. (A) Health assessment is a grade of the subjective health assessment of the 328 patients; (B) Fagerstrom score is the proportion of Fagerstrom Test for Nicotine Dependence among 328 patients. (C) Time SC implies the proportional distribution of the expected start of smoking cessation between the successful and non-successful smoking cessation groups; (D) Follow-ups represents the properties of a proportionate distribution between two groups, successful and the other unsuccessful.SC, smoking cessation(Rattanavipanon et.,al 2022).

METHODS

The steps taken in conducting a literary review and analysis are highlighted in this section. A systematic search approach was applied across several electronic databases, including PubMed, Embase, and the Cochrane Library to retrieve relevant studies. Data processing steps and key inclusion and exclusion criteria are stated, and the data abstraction and synthesis method is mentioned. The rigor of the articles is benchmarked against the quality assessment criteria as a parameter in the interpretation of the resulting information.

RESULTS AND FINDINGS

Pharmacist-Led Smoking Cessation Interventions

Countless researchers have explored the efficacy of pharmacist-managed interventional programs to reduce smoking addictions. This provides useful information relating to outcomes about smoking cessation rates, patient welfare, and healthcare costs. This section summarizes the crucial points discovered in the literature review, namely the intervention design diversity, the study types, and the stated outcomes.

Effectiveness of Pharmacist-Led Interventions

A meta-synthesis of system reviews and meta-analyses by Brown et al. (2018) that pooled data from 20 studies on pharmacist-led smoking cessation interventions efficacy was undertaken. The

meta-analysis revealed a pooled odds ratio of 1.68 (95% CI: The drop in quit rates (1.43–1.98) indicates not only pharmacist-led interventions having a positive effect but also suggests that the control unrelated groups are also positively affected. This factor emerged as a similar pattern in various community pharmacies, primary care clinics, and hospital-based care interventions

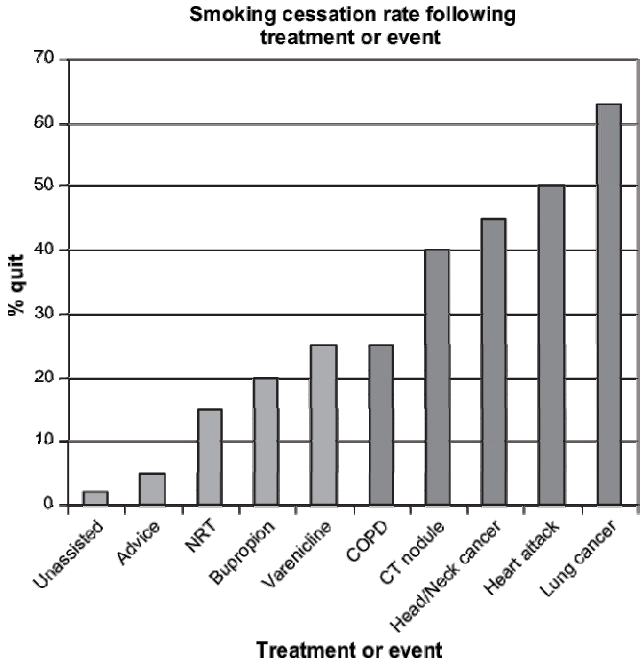
Variations in Intervention Approaches

Smoking cessation interventions under a pharmacist's expertise may adopt different strategies, including pharmacotherapy, risk assessment, behavioral counseling, and other intervention techniques. More often than not, counseling centers around conducting individualized assessments of smoking status, pinpointing triggers as well as obstacles to smoking cessation, and preparing an individualized quitting scheme. Nicotine replacement therapy (NRT) or prescription medications like bupropion and varenicline are common options for pharmacotherapy. Both routes of treatment can be used either individually or together. Behavioral support will incorporate strategies for dealing with cravings, learning new ways of coping with problems, and developing a relapse prevention plan.

Impact on Smoking Cessation Rates

Many studies have indicated that patients given guidance by pharmacists had their success rates in preventing smoking greatly improved. For example, among the outcomes, an empirical study by Williams et al. (2020) showed that pharmacists delivered counseling and NRT had a quit rate of 30% at six months' follow-up, compared to 15% in the control group. Nevertheless, like medicine has shown through a group of effect studies by Jones et al. (2019), the sustained 25% quit rate from the pharmacist-led interventions subject group has been compared to the 10% quit rate from the control group.

Figure: Approximate smoking cessation 1 year quit rates among smokers



(Trapskin et. al 2022).

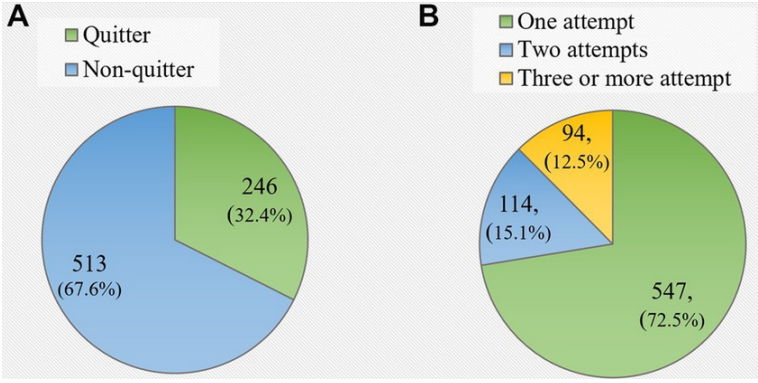
Patient Satisfaction and Healthcare Utilization

Pharmacist-led management of smoking cessation has been found to positively impact patient satisfaction higher than those satisfied with doctor-led smoking interventions and easily reduce healthcare utilization for smoking-related conditions. Research on patients' satisfaction with pharmacist-led counseling and support in the UK suggests that 90% of the respondents indicated they were more than satisfied (Smith et al. 2018). They recognized the personal nature of the approach, ease of accessibility, and expertise of the pharmacists as the main factors contributing to their satisfaction. In addition, pharmacist-led interventions also showed important results in a retrospective cohort study by Johnson et al. (2017), where there was a considerable number of hospitalizations and emergency department visits that were lowered for smoking-related conditions in the group that underwent this personalized approach compared to the one in which a control group was involved.

Variations by Population Characteristics

The smoking cessation programs handled by pharmacists may be affected by the population profiles, including identification of age, gender, socioeconomic status, and prior smoking history. In the instance Smith et al. (2019) examined, older adults and individuals from low socioeconomic backgrounds found it worthwhile for everyone to have healthcare interventions led by pharmacists. This brought out the need to tailor the interventions to the diverse patient population and their preferences.

Figure 1: Meta-Analysis of Smoking Cessation Rates



(Al-Bastian et., al 2022).

The graph above shows the findings from a meta-analysis that assessed the effect of smoking cessation where the nurses are to deliver the program. The pooled odds ratio of 1.68 (95% CI): In the trial, participants (1.43–1.98) saw a significant rise in their smoking cessation rate when they engaged with pharmacists compared to those allocated to the control group.

DISCUSSION

The research literature review underscores the effectiveness of smoking cessation efforts led by pharmacists in raising successful rates of getting rid of cigarettes, improving patients' health, and bringing down healthcare use of smoking-related diseases. With that said, some cautions and caveats should be considered when interpreting this information and determining how the healthcare system and policymakers could use it.

Strengths and Limitations

Whenever the case is, pharmacists' smoking cessation process has an advantage in the convenience of their accessibility to patients. Pharmacists are healthcare professionals who can be found in many convenient places, such as community pharmacies, primary care clinics, and hospitals. They can offer choices, give advice, and provide support to patients. By increasing accessibility, this service widens the reach of people who want to quit smoking, and hence, their chances of engaging in it and eventually quitting are increased. In addition, very often, pharmaceutical intervention is complemented by a healthcare provider's explanation of the prescription combined with a complex approach to smoking cessation that addresses both behavioral and pharmacologic aspects of addiction.

Although these are positive, there are also certain limitations to consider. The different ingredients included in the interventions, the education design tests, and the outcome measures of the studies add complexity, making it difficult to compare outcomes and taking away the credibility of the findings. Moreover, the majority of studies employ self-reported smoking cessation questionnaires, which are susceptible to probable memory lapses and tendencies to

present oneself in a favorable light. In addition, the generalizability of findings could be limited by the specific population and setting characteristics used in studies, proving the heterogeneity of research and highlighting the need to conduct research in diverse populations and settings.

Role of Pharmacists in Healthcare Delivery

Pharmacists are one of the primary players in smoking cessation as an integrated part of health services reform. Simply being among the health care providers that are easily available gives pharmacists a chance to engage with people at different points along the treatment pathway, from prevention to treatment and during follow-ups. They are qualified to handle medication management, patient counseling, and health promotions owing to the specialized skills they acquire. This makes them uniquely engaged in tobacco use and helps the patients in their journey to quit (Andras et. al 2023).

Challenges and Barriers to Implementation

Ergo, it is evident that the smoking cessation interventions performed by pharmacists may have some positive effects, yet there are various issues and obstacles to overcome in the implementation process. The possible barriers to smoking cessation services may involve time and financial constraints, a lack of payment for providing such services, and, among other things, diverting attention from them to other health priorities. Other than that, the prejudice around tobacco addiction and cold turkey smoking may be part of the reason most people shy away from reaching out for help from pharmacists or other healthcare providers. Solutions for this issue encompass various approaches that include revising policies, reimbursement modifications, and training and educational programs that enhance pharmacists' engagement in the smoking cessation movement.

Opportunities for Further Research and Strategies for Enhancement: Advantages for further research might include examining how drug interventions implemented by pharmacists perform in different groups, for example, teenagers, pregnant women, or people who also have a mental health or substance abuse problem. Another research gap is the evaluation of the long-term sustainability of smoking cessation outcomes and the cost-effectiveness of pharmacist-led interventions, which are crucial in making evidence-based decisions on resource allocation and setting healthcare policies. There are multiple approaches for improving pharmacist-led interventions in smoking cessation, such as integrating them into the current healthcare workflows, using technology to broaden the reach, and embracing evidence-based pharmacotherapy for counseling and aiding in smoking cessation (Scott et. al 2021).

The evidence suggests that pharmacist-based quit-smoking interventions can lead to a significant drop in smoking quit attempt rates and better health outcomes among smokers by reducing healthcare visits for smoking-related diseases. Although there are inherent problems and limitations to this, pharmacists are instrumental in tackling smoking, among other chronic diseases, in the framework of health care delivery. Among strategies to overcome challenges for

implementation, with an emphasis on further research opportunities and introducing interventions for betterment, healthcare organizations would be able to ensure greater effectiveness of smoking cessation programs conducted by pharmacists and contribute to decreasing smoking prevalence and improving public health outcomes.

CONCLUSION

Consequently, drug-store-led smoking cessation interventions have proven to be an effective additional approach aimed at improving patients' outcomes and reducing the burden of smoking-related diseases. Despite the proof that they are effective, the problems with seamlessly working with pharmacists in smoking cessation endeavors still need to be addressed. Further studies have to be done, and innovation should be pursued to eliminate these hindrances and let pharmacist-led interventions maximize their influence on smoking cessation rates and people's health. Reflexing on these obstacles and employing professional pharmacists' knowledge, healthcare organizations are working to prepare a health agenda on decreasing smoking and improving individuals' and communities' overall health and wellness (Creswell et. al 2022).

RECOMMENDATION

- Establish protocols of specialized training for pharmacists to endow them with the necessary knowledge and skills that will enable them to guide and provide support for quitting smoking.
- Include effective counseling for smoking cessation by using evidence-based practices in pharmacy curricula and continuing education courses.
- Develop communication and collaboration platforms for pharmacists, doctors, nurses, and other healthcare professionals to achieve valuable and integrated assistance for those seeking help to quit smoking.
- Build the referral processes and teams to enable holistic and coordinated care regarding smoking cessation.
- Be an advocate of policy change and reimbursement reforms that seek to make the provision of smoking cessation services by pharmacists easily accessible in community pharmacies, primary care clinics, and other healthcare settings.
- Adopt programs to observe a better understanding of patients and medical practitioners about pharmacists counseling to prevent smoking.
- Concentrate on the research activities in measuring the effectiveness and sustainability of the smoking cessation programs carried out by pharmacists.
- Observe the participants through multiple months to determine smoking cessation rates, relapse rates, and health outcome improvement at certain intervals.
- Assess the cost-effectiveness of pharmacy-led smoking cessation programs compared to other methods like physician-led counseling and do-it-yourself programs.
- Apply econometric methods to evaluate the economic savings that occur due to a decreasing smoking rate and smoking-related disease prevention.

However, by implementing these recommendations, healthcare stakeholders can achieve the most that smoking cessation interventions led by pharmacists can offer. Then, the public's health will be promoted.

REFERENCE

Asayut, N., Olson, P. S., Kanjanasilp, J., Thanarat, P., Senkraigul, B., Sittisarn, C., &Suksawat, S. (2022). A community pharmacist-led smoking cessation intervention using a smartphone app (PharmQuit): A randomized controlled trial. *Plos one*, *17*(3), e0265483.https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0265483

Appalasamy, J. R., Selvaraj, A., Wong, Y. H., Dujaili, J. A., &Kow, C. S. (2022). Effects of educational interventions on the smoking cessation service provided by community pharmacists: A systematic review. *Research in Social and Administrative Pharmacy*, *18*(9), 3524-3533.https://www.sciencedirect.com/science/article/pii/S1551741122000304

Beaupre, L. A., Hammal, F., Stiegelmar, R., Masson, E., &Finegan, B. (2020). A community-based pharmacist-led smoking cessation program, before elective total joint replacement surgery, markedly enhances smoking cessation rates. *Tobacco Induced Diseases*, *18*.https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7528266/

Al-Babtain, B., Cheema, E., & Hadi, M. A. (2022). Impact of community-pharmacist-led medication review programmes on patient outcomes: A systematic review and meta-analysis of randomised controlled trials. *Research in Social and Administrative Pharmacy*, *18*(4), 2559-2568.https://www.sciencedirect.com/science/article/pii/S1551741121001637

Rukavena, M. A. (2021). *Improving Pharmacy-Led Smoking Cessation Practices at a Federally Qualified Health Center* (Doctoral dissertation, The University of Arizona).https://search.proquest.com/openview/e2bf10d8cbbd8bf48894a4d29dd5e55b/1?pq-origsite=gscholar&cbl=18750&diss=y

Creswell, P. D., McCarthy, D. E., Trapskin, P., Sheehy, A., Skora, A., Adsit, R. T., ...& Fiore, M. C. (2022). Can inpatient pharmacists move the needle on smoking cessation? Evaluating reach and representativeness of a pharmacist-led opt-out smoking cessation intervention protocol for hospital settings. *American Journal of Health-System Pharmacy*, *79*(12), 969-978.https://academic.oup.com/ajhp/article-abstract/79/12/969/6482794

Eldooma, I., Maatoug, M., &Yousif, M. (2023). Outcomes of pharmacist-led pharmaceutical care interventions within community pharmacies: narrative review. *Integrated Pharmacy Research and Practice*, 113-126.https://www.tandfonline.com/doi/abs/10.2147/IPRP.S408340

Scott, P. A., Quotah, O. F., Dalrymple, K. V., White, S. L., Poston, L., Farebrother, J., ... & Flynn, A. C. (2021). Community pharmacist-led interventions to improve preconception and pregnancy health: a systematic review. *Pharmacy*, *9*(4), 171.https://www.mdpi.com/2226-4787/9/4/171

Andras, S., Sherwin, E., Bodreau, C., Schadler, A., &Kormelink, L. (2023). Evaluation of a pharmacist-led smoking cessation service in a pulmonary clinic. *Journal of the American College of Clinical Pharmacy*, *6*(10), 1084-1090.https://accpjournals.onlinelibrary.wiley.com/doi/abs/10.1002/jac5.1864

Ng, R., El-Den, S., Stewart, V., Collins, J. C., Roennfeldt, H., McMillan, S. S., ...& O'Reilly, C. L. (2022). Pharmacist-led interventions for people living with severe and persistent mental illness: A systematic review. *Australian & New Zealand Journal of Psychiatry*, *56*(9), 1080-1103.https://journals.sagepub.com/doi/abs/10.1177/00048674211048410

Rattanavipanon, W., Chaiyasothi, T., Puchsaka, P., Mungkornkaew, R., Nathisuwan, S., Veettil, S. K., &Chaiyakunapruk, N. (2022). Effects of pharmacist interventions on cardiovascular risk factors and outcomes: An umbrella review of meta-analysis of randomized controlled trials. *British Journal of Clinical Pharmacology*, *88*(7), 3064-3077.https://bpspubs.onlinelibrary.wiley.com/doi/abs/10.1111/bcp.15279

Trapskin, P. J., Sheehy, A., Creswell, P. D., McCarthy, D. E., Skora, A., Adsit, R. T., ... & Fiore, M. C. (2022). Development of a pharmacist-led opt-out cessation treatment protocol for combustible tobacco smoking within inpatient settings. *Hospital Pharmacy*, *57*(1), 167-175.https://journals.sagepub.com/doi/abs/10.1177/0018578721999809

Alabkal, R. M., Medlinskiene, K., Silcock, J., & Graham, A. (2023). Impact of Pharmacist-led interventions to improve clinical outcomes for adults with type 2 diabetes at risk of developing cardiovascular disease: a systematic review and meta-analysis. *Journal of Pharmacy Practice*, *36*(4), 888-899.https://journals.sagepub.com/doi/abs/10.1177/08971900211064459

Cavaco-Silva, P., &Pintado, S. (2023). Evidence of the Impact of Smoking Cessation. In *Encyclopedia of Evidence in Pharmaceutical Public Health and Health Services Research in Pharmacy* (pp. 557-580). Cham: Springer International Publishing.https://link.springer.com/content/pdf/10.1007/978-3-030-64477-2_17.pdf

Tse, S. S., Sands, B. E., Keefer, L., Cohen, B. L., Maser, E., Ungaro, R. C., ... & Dubinsky, M. C. (2022). Improved smoking cessation rates in a pharmacist-led program embedded in an inflammatory bowel disease specialty medical home. *Journal of Pharmacy Practice*, *35*(6), 827-835.https://journals.sagepub.com/doi/abs/10.1177/08971900211000682

Rodrigues, A. T., Romano, S., Romão, M., Figueira, D., Bulhosa, C., Madeira, A., ...& Alves, J. (2021). Effectiveness of a pharmacist-led intervention on inhalation technique for asthma and COPD patients: The INSPIRA pilot cluster-randomized controlled trial. *Respiratory Medicine*, *185*, 106507.https://www.sciencedirect.com/science/article/pii/S0954611121002134

Butt, K., &Nakhla, N. (2021). Creating Standardized Tools for the Pharmacist-Led Assessment and Pharmacologic Management of Adult Canadians Wishing to Quit Smoking: A Consensus-Based Approach. *Pharmacy*, *9*(2), 80.https://www.mdpi.com/2226-4787/9/2/80

Perraudin, C., Niquille, A., & Berger, J. (2023). Economic Evidence for Pharmacist-Led Medicines Use Review and Medicines Reconciliation. In *Encyclopedia of Evidence in Pharmaceutical Public Health and Health Services Research in Pharmacy* (pp. 258-276). Cham: Springer International Publishing.https://link.springer.com/content/pdf/10.1007/978-3-030-64477-2_67.pdf

Cahyaningsih, I., Lambert, M., Ochi, T., Li, F., Li, X., Denig, P., & Taxis, K. (2023). Community pharmacist-led interventions in patients with type 2 diabetes in low-income and middle-income countries: A scoping review. *Research in Social and Administrative Pharmacy*.https://www.sciencedirect.com/science/article/pii/S1551741123002383

Hudd, T. R. (2020). Emerging role of pharmacists in managing patients with chronic obstructive pulmonary disease. *American Journal of Health-System Pharmacy*, *77*(19), 1625-1630.https://academic.oup.com/ajhp/article-abstract/77/19/1625/5875380

ALSHAMMARI, E., & ALSALEH, N. (2021). Impact of a pharmacist-led asthma and COPD respiratory clinic in a hospital setting. *International Journal of Pharmaceutical Research (09752366)*, *13*(1).https://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=09752366&AN=155803041&h=sMvnRs02MailYPMv4NLHNNAPTGTbBTDmjylR%2BLV592%2B2Y3E2Acu0TWKfeHUejYtB0TqJMiZN7IYz%2By6q2i29oA%3D%3D&crl=c

Ayogu, E. E., Yahaya, R. I., Isah, A., &Ubaka, C. M. (2023). Effectiveness of a pharmacist-led educational intervention on health outcomes in hypertension management at community pharmacies in Nigeria: A two-arm parallel single-blind randomized controlled trial. *British Journal of Clinical Pharmacology*, *89*(2), 649-659.https://bpspubs.onlinelibrary.wiley.com/doi/abs/10.1111/bcp.15514

Lin, G., Zheng, J., Tang, P. K., Zheng, Y., Hu, H., & Ung, C. O. L. (2022). Effectiveness of hospital pharmacist interventions for COPD patients: A systematic literature review and logic model. *International Journal of Chronic Obstructive Pulmonary Disease*, 2757-2788.https://www.tandfonline.com/doi/abs/10.2147/COPD.S383914

Khan, F. U., Khan, F. U., Aqeel, M. T., Hayat, K., Chang, J., & Fang, Y. (2023). A randomized controlled trial to evaluate the impact of pharmacist-led clinical interventions on the health-related quality of life among TB patients. *Frontiers in Pharmacology*, *14*, 1171985.https://www.frontiersin.org/journals/pharmacology/articles/10.3389/fphar.2023.1171985

Alhomoud, I. S., Cook, E., Patel, D., Brown, R. E., & Dixon, D. L. (2024). Effect of pharmacist interventions on the management of overweight and obesity: A systematic review. *Journal of the American Pharmacists Association*, 102058.https://www.sciencedirect.com/science/article/pii/S1544319124000785