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Pharmacist-Delivered Interventions on Pain Management: Review and Cluster-Randomized Trial

Dr. Bimal[1], and Dr.K. Dhamala[2]

[1] *Department of Pharmacy, Gandaki Medical College, Nepal.*

[2] *Department of Pharmacy, Gandaki Medical College, Nepal.*

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Abstract

Pharmacists have played a vital role in the oversight of chronic pain, guaranteeing the optimal use of medication. There is variability in the therapies administered by pharmacists and their effects. Six Internet sources were examined from the start to July 2024 for English-language literature investigating the pharmacist's role in chronic discomfort treatment interventions. Research examining the impact of pharmacist interventions, individually or as part of collaborative groups, on chronic pain treatment was considered. This review encompassed fourteen research with 2400 individuals. Six research studies included randomized controlled experiments, while the others were qualitative research studies in which pharmacists delivered interventions independently or in conjunction with other healthcare providers. The pharmacist predominantly conducted drug evaluations as their primary treatment. The pooled study revealed that pharmacist-delivered therapies decreased pain intensities in people with chronic pain. Pharmacist-delivered opiate management was successful; nevertheless, the intervention's effects on physical well-being, depressive disorders, anxiety, and quality of life yielded mixed findings. The action taken by the pharmacist incurred more costs than the standard therapy. Pharmacists play a significant role in chronic pain treatment by assuring the optimal administration of medication, which leads to decreased pain severity. Additional research with a robust design is required to assess the effects of pharmacist-delivered interventions, either independently or within an integrated group, on economic advantages and other medical results.

Keywords: Pharmacist, Interventions, Pain Management, Review.

1 INTRODUCTION

Acute and chronic pain is a substantial public health issue globally, impacting the welfare of millions. With the increasing frequency of pain-related illnesses, it is essential to discover appropriate pain treatment solutions (Chuan et al., 2021). This requires a multidisciplinary strategy, including diverse healthcare specialists, each significantly enhancing patients' health. Pharmacists have become vital partners in pain treatment, providing specialized skills and knowledge that improve pain results.

Chronic pain is characterized as pain that endures beyond the typical healing process of three months or more (Knotkova et al., 2021). It constitutes a significant worldwide health issue and a source of impairment. Research demonstrates a substantial incidence of chronic pain, affecting between 12% and 50% of individuals in impoverished nations and up to 65% in affluent countries. The financial cost

of pain is substantial, according to estimates ranging from $580 billion to $650 billion in the US. Chronic pain is linked to psychological disorders, including anxiousness and depression, which impair a person's standard of life (Ma et al., 2021). The significant incidence and persistent nature of chronic pain have resulted in an increase in research focused on optimal management strategies for this illness.

Even with the existing data, several obstacles impede efficient pain treatment. The need for more clearly delineated pain treatment procedures, limited knowledge and competencies among medical professionals, the absence of collaboration among staff, customers' apprehension regarding harmful effects, and hesitance to utilize analgesics are significant obstacles to successful pain management (Raffaeli et al., 2021). The participation of pharmacists in drug evaluations and instruction on pain represents a potential approach to diminish pain intensity and improve physical functioning. Engaging medical pharmacists skilled in pain treatment alleviates the strain on physicians and optimizes opioid utilization (Gregory & Austin, 2021). Recognized as drug specialists, pharmacists are integral to pain treatment. Implementing cluster-based randomized trials and guaranteeing the secure and efficient use of analgesics substantially enhance patient care and results. Pharmacists engage in counseling with patients, drug treatment leadership, and joint decision-making with other medical professionals. They optimize drugs to reduce unwanted effects and improve patient compliance with pain relief strategies.

2 BACKGROUND

Numerous studies have investigated the effects of pharmacists collaborating with a multidisciplinary managing pain group to inform patients and do medication assessments (Nees et al., 2020). Aly et al. assessed the impact of distributing an instructional booklet to individuals with knee pain in local pharmacies, effectively enhancing patient understanding of pain (Aly et al., 2020). Axon et al. conducted research in which they gave patient information to individuals with pain, resulting in enhanced self-perceived health and functionality (Axon et al., 2022). The positive outcomes indicate that local pharmacists can contribute to bridging the gap in pain treatment for patients, particularly in low- and middle-income countries, through training and medication assessment.

Nepal is a lower-middle-income country in South Asia, where medicine is delivered through a dual system comprising government-funded services and private healthcare institutions (Shahbaz & Howard, 2024). Medicine is disproportionately allocated and predominantly focused in metropolitan regions of the country. Neighborhood pharmacies frequently serve as the initial point for most individuals in Nepal, owing to their affordable services, convenient accessibility, and faith in their medical advice.

Dassieu et al. observed in their initial review that pharmacists' offering of pain information effectively decreased medication-related adverse reactions and severity of pain (Dassieu et al., 2022). Lexow et al. observed in their review that pharmacist-delivered medication evaluations reduce pain severity, enhance physical performance, and increase patient satisfaction (Lexow et al., 2022). A narrative analysis by Perry et al. emphasized that pharmacist-delivered chronic pain training and

medication administration effectively mitigated pain and adverse drug-related events in neighborhood pharmacies (Perry et al., 2023). These investigations concentrated solely on a singular intervention component or environment and did not provide a complete analysis of pharmacist-delivered therapy of chronic pain (Rajballi-Naidoo et al., 2023). This study seeks to thoroughly describe pharmacist-delivered interventions in pain treatment, whether conducted alone or within a multidisciplinary group, regardless of the environment (Thapa et al., 2021; Zheng et al., 2022). This study is to examine the effects of a local pharmacist-delivered medication evaluation and educational program on pain levels, mobility, expertise, depressive disorders, and overall quality of life in individuals with pain.

3 MATERIALS AND METHODS

3.1 Study Design

This research was a multicenter, open-label, cluster-randomized investigation including 22 community pharmacies situated in Pokhara, Nepal. The study was carried out from May 2020 to July 2024. Neighborhood pharmacies (clusters) were assigned to participate in the treatment, which entailed training pharmacists and personnel at every local pharmacy. This approach decreased the danger of contaminating the treatment effects.

3.2 Participating Community Pharmacies

Neighborhood pharmacies in the Pokhara Valley were arbitrarily contacted by telephone or in reality to assess their willingness to participate in the research. If the community pharmacy expressed fascination, data on their daily client volume was acquired. The pharmacist was informed about the research specifics and its response. Participating neighborhood pharmacies were classified into blocks based on daily client traffic and randomly assigned in a 1:1 ratio to either the treatment or control group using a computer-generated permuted block layout. The selection of participants was conducted in a blinded manner by a third-party investigator using cluster-based randomized trials. Due to the study's environment, blinding was unfeasible for the subjects and the investigator.

3.3 Participants and Recruitment

The research enlisted participants aged 18 and older who had received a clinical diagnosis of pain and had endured persistent pain for three months or more. Participants in the trial were limited to those who consented. At the same time, exclusions were made for persons unable to give written authorization, those with advanced disease, and people scoring above 80% on the pain knowledge measure.

Advertisements enlisted potential volunteers in neighborhood pharmacies. All prospective volunteers received a comprehensive description of the study's objectives, methodologies, and pertinent details regarding the research. Individuals indicating a desire to enroll were requested to sign a consent form written and exceptionally crafted in English to facilitate understanding.

3.4 Intervention Group

This study included educational and drug review treatments to facilitate shifts in behavior and enhance the proper application of drugs in people with pain for alleviating pain over six weeks. The academic action, supported by a leaflet and film, was expected to augment the physical and psychological capacities of those taking part by enhancing their understanding of pain management and related signs and symptoms. The author trained neighborhood pharmacists from several shops to implement the treatment, which included counseling and prescription monitoring.

Every person in the cluster-based randomized trials got personalized educational counseling on pain and managing pain. Individuals had an evaluation of their drugs. Participants were questioned on their understanding of pharmaceuticals, including indications, proper usage, side effects, compliance challenges, and self-medication behaviors. They had a further evaluation for the potential ill effects associated. Participants were advised and referred to a doctor if any drug overuse, incorrect dosage, or possible adverse reactions were detected.

Respondents viewed a video vignette depicting the care of pain involving an individual and a pharmacy technician to reinforce the instructional material. Over the six-week duration, respondents engaged in weekly consultations with the local pharmacist to address any inquiries regarding the learning resources and received counseling as necessary.

3.5 Control Group

Patients in the control group got standard treatment administered by community pharmacists. This encompassed the provision of drugs, guidance on their administration, and fundamental counseling for pain care. To guarantee that participants had optimal treatment, all individuals were provided with treatment education counseling resources (brochures and video) and underwent a review of their medications after their trial.

3.6 Primary Outcomes

The principal outcome significance was the alteration in pain score, evaluated using a Numerical Rating System (NRS) on an 11-point scale from starting to three weeks and after the trial. The research assessed the alteration in physical functioning using the West of Ontario and McMaster Colleges Pain Index, quantifying discomfort, stiffness, and challenges in executing daily tasks in individuals with pain. This was augmented by an evaluation of participants' knowledge of pain, conducted through a knowledge evaluation questionnaire created via an extensive literature review and questions modified from the verified pain patient understanding survey. The last poll consisted of 12 multiple-choice inquiries, with three items dedicated to evaluating information on pain, its associated risks, medication usage, the significance of physical activity, and self-care practices. Expert comments were solicited from doctors and pharmacists to guarantee content validity, and the survey was revised accordingly.

Pilot research, including twelve individuals with pain, established internal coherence with a Cronbach alpha score of 0.85.

3.7 Secondary Outcome

The additional relevant results included alterations in participants' depressive scores and quality of life. Sadness was evaluated utilizing the Patient-Reported Outcomes Measurement Integrated System melancholy 8b short-form survey. The instrument evaluates self-reported adverse feelings (sorrow, guilt), self-perceptions (self-criticism, inadequacy, social thinking (isolation, relational estrangement), and diminished beneficial effects (loss of fascination, significance, and goal).

3.8 Sample Size

Based on findings from a prior study, the research anticipated that the measure would provide a moderate impact, resulting in a decrease of 0.51 points in the pain rating and 0.49 points in bodily functioning. A sample size of 120 patients was calculated to get a threshold for significance of 0.06, using a 70% efficiency. After considering a 25% dropout rate, a final representative sample of 150 respondents was established, with 85 individuals in the nonintervention and intervention categories.

3.9 Statistical Analysis

Each analysis was conducted utilizing a modified intention-to-treat approach. A descriptive approach was employed across the randomized categories, with category variables shown as frequency and percent. Constant variables were expressed as average and standard deviation. A repeated measures analysis of covariance was employed to investigate the variance in impacts for both primary and secondary results. The multiple imputation approach was employed to substitute the missing information during the follow-up intervals. Each analysis used the Statistical Program for the Social Sciences (SPSS version 26.0).

3.10 Fidelity Monitoring

Compliance and integrity were assessed using the telephone call records and data collecting sheets. The leading researcher arranged monthly visits and discussions with regional pharmacists to verify that the measure was well implemented and that the information collection adhered to the stated methodology.

4 RESULTS AND DISCUSSIONS

4.1 Study Characteristics

A total of 520 publications were discovered, of which 30 were subjected to additional scrutiny. Fourteen papers were chosen, comprising six Randomized Controlled Experiments (RCTs), three retroactive chart evaluations, two before-and-after research, one retroactive population research, one planned cohort research, and one cross-sectional research (Figure 1). The investigations were

performed in the USA, UK, France, Switzerland, and Japan across regular workplaces, medical facilities, or specialist environments such as pain treatments and rehabilitation institutions.

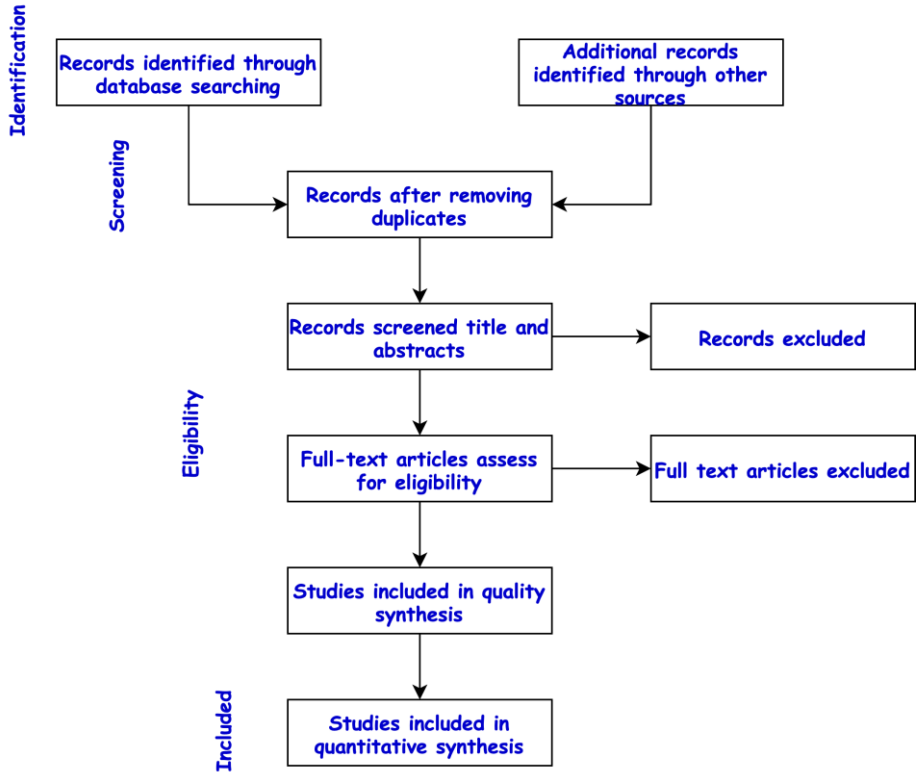

Figure 1: Workflow of the Research

The investigations enrolled 2400 people, with a median population sample of 120. The average age of the respondents ranged from 43 to 70 years, with a predominance of females. Respondents in this research indicated persistent discomfort originating from the muscles and tendons (knee, vertebrae, joint, back), the nervous system (headaches and migraines), and nonspecific chronic pain.

4.2 Quality of Studies

4.2.1 Randomized Controlled Studies

The six considered RCTs showed a minimal risk of bias across most of the evaluated criteria. Nonetheless, there were concerns over the potential for bias arising from deviations from the original goal across all trials, attributable to the lack of blinding for patients and workers, given that most of the research was open-label. Two investigations were assessed to possess an elevated risk due to the evaluation of outcomes and selection of information provided.

4.2.2 Observational Studies

The majority of the investigations were assessed as being of moderate quality. Two investigations were evaluated to have a significant risk of bias, five had a medium risk, and just one had a small likelihood of prejudice. The investigations were assessed to possess a substantial risk of bias from choosing participants and variable confounding.

4.3 Pharmacist Intervention

4.3.1 Medication Review

The pharmacist's most prevalent treatment was prescription assessment, conducted in eight trials. In these evaluations, pharmacists evaluated sensitivities and adverse reactions to drugs, examined medications, and proposed modifications to the prescription regimen. Pharmacists personalized pharmacotherapy and evaluated for medication-related issues and unresolved symptoms. Three investigations detailed how pharmacists established a pharmaceutical treatment strategy, including medication monitoring.

4.3.2 Multidisciplinary Group for Managing Pain

The research found five trials in which pharmacists participated in the transdisciplinary or multidisciplinary group for pain treatment. Pharmacists assessed patient prescriptions, implemented opiate management by screening and evaluating opioid usage to promote its prudent application, and delivered education to patients. These methods resulted in enhancements in pain scores, pain disability indices, feelings of depressive and anxiety disorders, confidence, degree of pain, and disruption, along with a decreased requirement for morphine administration.

4.3.3 Intervention Via Instructive Video

The research employed training films as an intervention tool, facilitating group discussions with pharmacists and doctors. Each film lasted 10 minutes and informed patients about managing pain and analgesic drugs. After the trial, patients' understanding of pain was enhanced, although no effect was noted on their functional condition.

4.4 Outcome Metrics of Randomized Controlled Trials

4.4.1 Pain Assessment/Intensity

Five trials documented the effect of pharmacist intervention on the level of pain. Shared estimates from the five trials indicated that pharmacist engagement lowered the severity of pain ratings in people with chronic pain relative to the control group. Subgroup evaluations suggested that the intervention by pharmacists was more efficacious when lasting a minimum of three months, particularly for individuals with musculoskeletal pain, and when it included an examination of medications handled or pharmaceutical treatment within the medication examine category, as well as across various pain aetiologies.

4.4.2 Physiological Functioning

Five studies identified physical health as an outcome criterion for their treatment. The pharmacist-delivered treatment showed a varied effect on the physical functioning of the individuals. Pooled estimations indicated that pharmacist-delivered interventions had a negligible impact on enhancing the

physical health of those who took part. No differences were detected when trials were categorized by length, pain caused, or pharmacist-delivered interventions.

4.4.3 Mental Health

In two trials assessing individuals' mental wellness, aggregated estimates indicated that pharmacist-delivered interventions had a negligible impact on their mental well-being.

4.4.4 Anxiety and Depression

Pharmacist-delivered interventions yielded variable outcomes for depression and anxiety. In the research, pharmacist assistance decreased depression and anxiety; however, no enhancements were observed in an alternative investigation.

4.4.5 Quality of Life

The pharmacist-delivered treatment has varied effects on individuals' quality of life. Although the study indicated an enhancement in quality of life, no alterations were seen within the survey.

4.4.6 Contentment and Acceptance of Pharmacist Treatment

Three investigations indicated that clients were pleased with pharmacists' participation in their ongoing medical administration since they saw improved service delivery. Likewise, healthcare professionals had favorable opinions regarding the involvement of pharmacists in the execution of pharmaceutical care plans, including prescription reviews, and concurred with the recommendations presented in the research.

4.4.7 Expenses and Advantages

Only a single research evaluated the expenses and advantages of pharmacist-delivered treatment. The intervention cost was determined by the expenses associated with pharmacist instruction, the execution of the treatment, pharmacist follow-up visits, and the utilization of medicine, as well as both primary and secondary health services. Compared to standard therapy, pharmacist-delivered intervention incurred more extraordinary expenses, mainly attributed to elevated salary costs, resulting in an extra cost of £54 to £77 per person in the therapy group vs the standard treatment group.

4.5 Outcome Metrics of Observational Research

This review encompassed eight studies based on observation. Six research documented pain intensity ratings. Pharmacists or interdisciplinary pain treatment programs that include pharmacists have a varied effect on patients' pain ratings. Four studies indicated an enhancement in scores. In five published investigations, physical health increased in four, while one research showed no effect.

Pharmacists implemented opiate stewardship and adjusted morphine dosage, resulting in dose reductions in two investigations and a dose increase in one research. Pharmacists detected and addressed medication-related issues in two investigations. Numerous studies included in the study

documented endpoints such as depressive disorders, quality of life, happiness, and acceptance of the treatment. The research indicated a beneficial effect on these results due to the administered treatment.

5 CONCLUSION

The study illustrated neighborhood pharmacists' significance in enhancing patients' understanding and alleviating pain through focused educational activities and thorough medication evaluations. Although the therapies enhanced pain scores, the improvement was clinically modest and did not substantially affect physical well-being, quality of life, or depression. The results underscore the necessity of counseling and assistance to persons with pain in communal environments. This analysis indicated mixed outcomes regarding the effect of the intervention by pharmacists on chronic pain treatment; nonetheless, there was encouraging evidence that the treatment decreased pain magnitude, with reviewing medications being the most prevalent interventional technique. The influence on physical and psychological well-being was not particularly substantial because of the variability in the intervention methodology, its characterization, and the contexts in which it was applied. There is a need for enhanced investigation and reporting of research assessing significant patient-reported results.

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