

Balancing Pain Management Best Practices: A Review Opioid and Non-Opioid Strategies in Pain Management Strategies in Low- and- Middle Income Countries.

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Abstract

The study assessed the availability and utilization of opioid and non-opioid pain management strategies in Low- and Middle-Income Countries (LMICs), analyzing disparities, and challenges in accessing and adopting these strategies. Adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, a rigorous methodology was employed, ensuring methodological transparency and comprehensive reporting. Inclusion criteria encompassed peer-reviewed publications from 2015 to 2023, focusing on LMIC-specific pain treatment techniques while excluding non-peer-reviewed literature and studies unrelated to LMICs or pain management. Using PubMed, EMBASE, Scopus, and the Cochrane Library, the search technique combined keywords and Medical Subject Headings (MeSH) terms with careful consideration. Boolean operators optimized the search process by combining keywords to refine or broaden the search scope, ensuring the retrieval of relevant articles. Data analysis followed a thematic approach, as recommended by Braun and Clarke (2006), enabling the comprehensive synthesis of findings. The research highlighted complex global disparities in opioid availability, impacted by inadequate data, unequal access, and low priority on pain management. Factors such as patient fatalism, training insufficiencies, and cultural norms affected opioid use. There were issues with public understanding and awareness of non-opioid medications, mostly due to the impact of the mainstream media. This discrepancy underscores the need for a balanced, multi-faceted approach to address these issues in LMICs.

Keywords: Pain Management, Opioids, Non-Opioid Analgesics, Low- and Middle-Income Countries (LMICs), Healthcare Disparities

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1. Introduction

Anekar (2023), pain management encompasses a range of strategies that are intended to advance the quality of life for those who are in pain by reducing suffering, mostly via medical engagement. Opioid methods include the use of drugs that operate on the central nervous system to lessen the experience of pain, such as morphine, codeine, and oxycodone; these drugs are derived from opium (Pathan Williams, 2012). Treatments and interventions that do not rely on opioid drugs are referred to as non-opioid methods. Also, non-opioid drugs for pain management include NSAIDs, acetaminophen, antidepressants, anticonvulsants, local anesthetics, and muscle relaxants. In comprehensive pain treatment approaches, a variety of non-opioid methods are employed. Non-pharmacological methods such as mindfulness, group support activities, cognitive-behavioral treatments, exercise therapy, and stress reduction are included in these. Supplementary treatments that are included in the multimodal integrative therapies used for pain management include physical therapy, yoga, acupuncture, and spinal manipulation. According to Kassim et al. (2023), Licina et al. (2023), and Shi & Wu (2023), patient education is an essential element of all these techniques and helps them be more successful in managing pain.

Since non-opioid techniques can reduce pain without the side effects and addiction that come with opioid drugs, such as overdose and addiction, they are becoming more and more important in the management of pain (NEJM + Team, 2022). As well, Licina et al. (2023) highlights the usefulness of non-steroidal anti-inflammatory drugs (NSAIDs) and other non-opioid painkillers in treating particular kinds of pain, such as acute and persistent low back pain, making them essential elements of non-opioid pain management approaches.

Efficient pain management is a complicated global issue that affects healthcare, social, and economic systems (Al-Mahrezi, 2017; Goldberg & McGee, 2011; Liu & Kelliher, 2022). The management of pain through the use of opioid and non-opioid medications has been a topic of discussion in policy talks (National Academies of Sciences et al., 2017b), clinical practice, and medical literature (National Academies of Sciences et al., 2017a, for example). Millions of people worldwide suffer greatly from chronic pain, which lowers the quality of life, causes huge personal suffering, and places a significant financial burden on society (Breivik et al., 2013; Phillips, 2009). Notably, wealthy countries and low- and middle-income countries (LMICs) differ significantly in terms

of geography, with the latter group suffering disproportionately from these issues.

LMIC, an abbreviation used for low and middle-income countries, is a classification that describes countries with a relatively moderate or lower economic status in gross domestic product (GDP) per capita, (Hamadeh et al., 2022). This term is often used by international organizations such as the World Bank and the United Nations to rank countries according to their economic prosperity.

This categorization includes both lower- and middle-income economies, as well as nations with differing income levels. When compared to middle-income economies, which still have lower levels of income than high-income nations, lower-income economies often have lower gross national incomes (Hamadeh et al., 2022). The following are a few examples of countries that belong to the LMIC category: Afghanistan, Bangladesh, Bolivia, Egypt, India, Kenya, Morocco, Nigeria, Pakistan, Sri Lanka, and Vietnam. These nations serve as examples of the multiplicity of economic environments and socioeconomic brackets seen in LMICs. The widespread problem of uneven access to painkillers in various economic environments is clarified by Knaul et al. (2022). Humphreys et al. (2022), Ju et al. (2022), and Knaul et al. (2022) highlight the striking differences between high-income areas—like the USA and Canada—that are dealing with an opioid overdose epidemic and low- and middle-income countries (LMICs) that are struggling to obtain necessary painkillers. The line drawn by Humphreys et al. (2022) and Knaul et al. (2022) depicts the 10–90 pain divide, which shows the disparity in which the richest 10% of countries possess 90% of the distributed morphine-equivalent opioids, leaving a significant portion of the world's population without access to sufficient pain relief. Knaul et al. (2018) addressed the disparity in research interest by pointing out that most of the emphasis is focused on opioid misuse and abuse, particularly in relation to the opioid epidemic in the United States. This focus has unintentionally sidelined the larger global health issue of unequal access to necessary pain medication, which is especially common in low- and middle-income countries. World Health Organization [WHO] (2019) highlights a research gap by highlighting how some essential painkillers, including tramadol and methadone, are excluded from empirical studies due to unclear medical justifications or scheduling issues.

Knaul et al. (2022) support a well-informed approach, emphasizing the necessity to separate the demands of providing pain alleviation in LMICs from the difficulties faced in high-income nations. Rather, it advocates for an implementation plan that incorporates knowledge from the experiences of high-income countries to avoid similar problems in LMICs thereby avoiding unnecessary barriers to the use/consumption of opioid analgesics. Overall, there appear to be urgent and significant pain treatment challenges that LMICs confront. Both opioid and non-opioid pain management options are scarce in these areas, which presents two key challenges. Given these critical discrepancies in access to pain management strategies, a systematic review is crucial. This review should encompass an in-depth analysis of the availability, utilization, and balance in the employing of both opioid and non-opioid strategies within LMICs. The focus would involve evaluating the differences between these two strategies (Opioid and non-opioid), their adoption rates, and the potential barriers hindering their accessibility and utilization. Such an extensive review could offer actionable insights into rectifying the imbalances and disparities in access to pain management strategies within LMICs, thereby paving the way for a more equitable, comprehensive, and effective approach to managing pain in these regions.

So far, there are several systematic reviews of literature across LMICs (e.g., Fleckner et al., 2023; Morriss & Roques, 2018; Yao et al., 2023a; Yao et al., 2023b). These authors offer important perspectives on the challenges associated with pain management, especially in LMICs. When taken as a whole, these studies highlight the complexity and variety of obstacles that prevent access to and proper use of opioid medication for pain relief in LMICs. These authors offer important perspectives on the challenges associated with pain management, especially in LMICs. When taken as a whole, these studies highlight the complexity and variety of obstacles that prevent access to and proper use of opioid medications to reduce the intensity of pain in LMICs.

Yao et al. (2023b) drew attention to the severe shortages of opioid distribution, particularly in rural regions of the Sub-Saharan part of Africa, highlighting how important it is to have a sufficient supply to treat severe and post-operative pain. Key obstacles are identified by the scoping review, including restricted availability, the primary use of non-opioid analgesics for pain management, bureaucratic obstacles impeding local production, gaps in healthcare practitioners' understanding regarding opioid use, and the critical need for thorough education and training. The study provides persuasive evidence of the complex issues across several areas, indicating the need for comprehensive changes to eliminate shortages and enhance access. Morriss and Roques (2018) provided insight into the significant obstacles to pain management in LMICs. The report outlines important challenges, such as insufficient awareness of and attitudes toward managing pain, inadequate emphasis placed on pain management by governments and medical facilities, unsuitable laws, and a shortage or lack of pain

remedies. It highlights how education plays a vital role in breaking down these complex obstacles and how educational programs are essential to improving pain management in LMICs.

Additionally, Fleckner et al. (2023) focused particularly on the treatment associated with cancer and the limited availability of opioid analgesics in different nations. The study emphasizes how difficult it is to overcome social, structural, educational, patient-related, and regulatory obstacles that obstruct licit access to medicinal opioids. One important lesson is the emphasis on the interdependence of these obstacles, how they are reinforced, and how important it is to take an interdisciplinary approach. To overcome these obstacles, Fleckner et al. emphasize how critical it is to close the knowledge and awareness gaps regarding effective cancer pain treatment. They do this by promoting a rights-based strategy that guarantees optimal health, including pain relief.

Together, these studies reaffirm the need for an integrated, multidisciplinary approach, highlighting the fact that to achieve optimal pain relief for every person, improved pain management practices in LMICs need coordinated efforts across multiple sectors, including healthcare, policy, education, and societal awareness.

Although these studies thoroughly evaluated the obstacles associated with opioid analgesics, there is a noticeable lack of investigation into the application, difficulties, and effectiveness of non-opioid approaches in the context of pain care in these resource-constrained environments. This disparity highlights the need for additional study and focus on comprehending and using non-opioid strategies in LMICs to provide a more thorough and equitable framework for pain management.

The context of LMICs often differs significantly from high-income settings due to various factors, including limited healthcare resources, different sociocultural norms, and varying access to medications (Cabieses & Bird, 2014; Dawkins et al., 2021; Ojo et al., 2021; Peters et al., 2008). Understanding the utilization and efficacy of both opioid and non-opioid strategies within LMICs is fundamental. This investigation can shed light on the potential barriers, acceptance, and adaptability of these strategies in resource-constrained environments, potentially offering insights into tailoring effective pain management approaches specifically for these settings.

While there are existing systematic reviews, that are focused on non-opioid realities outside of the LMICs, there is a dearth of systematic review knowledge on non-opioid strategies in LMICs. For example, although these studies by Sohi et al. (2022) and Chang et al. (2023) provided important insights regarding the effectiveness of non-opioid strategies for pain associated with cancer and the effects of non-opioid intravenous analgesics following hip surgery, they did not particularly target LMICs in their research.

Owing to the above background, the present study aimed to comprehensively evaluate the availability, utilization, and barriers associated with opioid and non-opioid pain management strategies in LMICs. More specifically, the study attempted to achieve the following study objectives:

- Assess the availability and utilization of opioid and non-opioid pain management strategies within LMICs.
- Analyze the disparities and challenges in access to and adoption of these strategies within resource-constrained environments.

2. Methodology

2.1 Design

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which are essential for guaranteeing methodological rigor, transparency, and robustness in the review process, provide a structured and rigorous approach that forms the foundation of this systematic review's methodology (Page et al., 2021). PRISMA guidelines provide a crucial framework that directs researchers in the methodical application of selection criteria, search tactics, and the synthesis of pertinent material for systematic reviews. The PRISMA guidelines were first developed by Moher et al. (2009) and then revised by Page et al. (2021), providing a comprehensive and strong framework for carrying out systematic reviews. The aforementioned principles aim to foster methodological transparency and guarantee the thorough reporting of all stages of the systematic review process, ranging from study selection and search strategy to finding synthesis and reporting. By including these recommendations, the current systematic review hopes to maintain a high level of quality, dependability, and attention to detail throughout the review procedure. Systematic review studies on pain management that have not only focused on opioid and non-opioid strategies but also adopted the PRISMA design are numerous (e.g., Chang et al., 2023; Sohi et al., 2022; Yao et al., 2023a; Yao et al., 2023b). These studies have effectively demonstrated the PRISMA design's capability to systematically synthesize and address diverse issues within the domain of pain management. The successful integration and utility of the PRISMA guidelines within these prior

studies significantly influenced the decision to employ PRISMA in the current research.

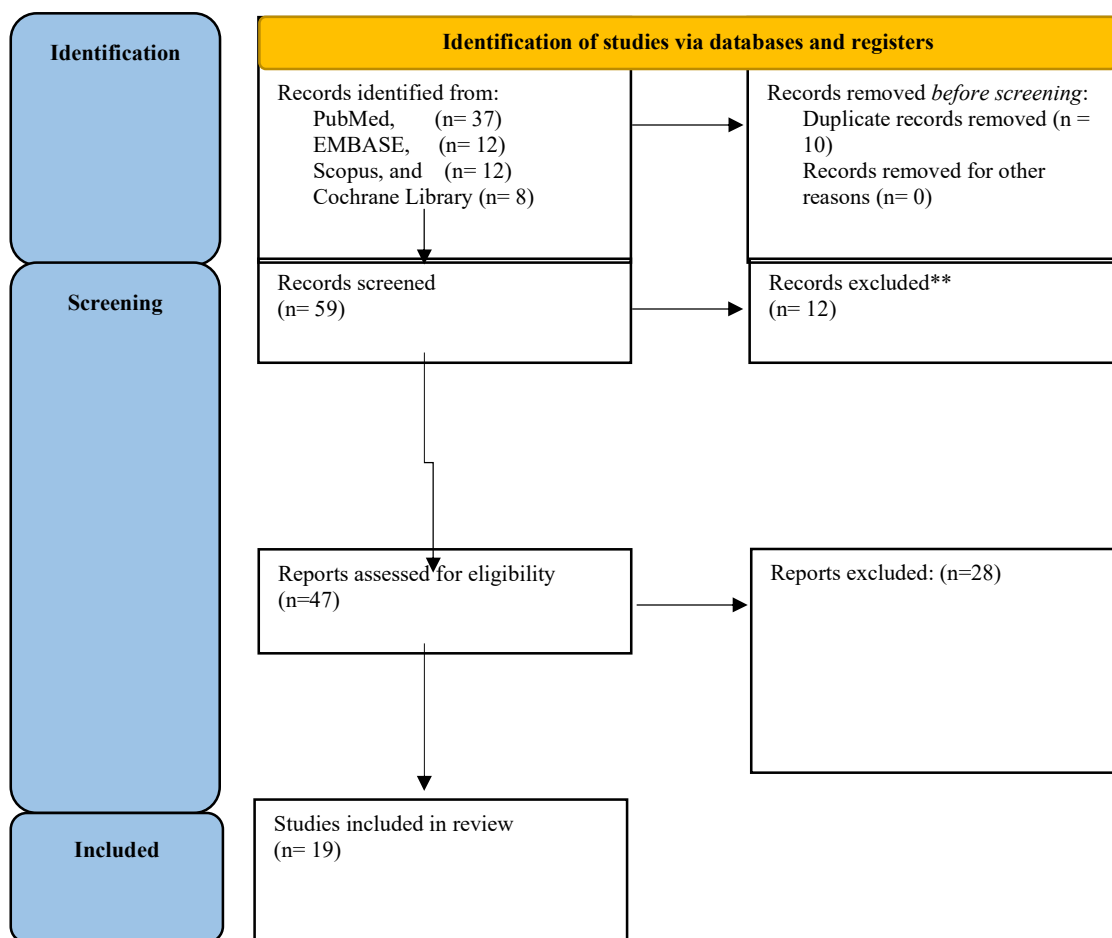
2.2 Inclusion Criteria

- Publication Type: publications from peer-reviewed journals, systematic reviews, meta-analyses, and grey literature that highlight LMIC-specific pain treatment techniques.
- Publication Date: studies that were published between 2015 and 2023 to guarantee up-to-date and relevant studies.
- Study Design: Original articles addressing the availability, feasibility, or barriers to opioid and non-opioid pain treatment methods, as well as systematic reviews and meta-analyses.
- Population: Research carried out in LMICs that focus on patients, medical personnel, or healthcare systems that manage pain.
- Language: Studies published in English.

2.3 Exclusion Criteria

- Publication Type: Non-peer-reviewed literature, conference abstracts, letters, editorials, commentaries, and books.
- Publication Date: Research that was published before 2015.
- Study Design: Case studies, non-research papers, and studies that don't specifically include opioid and non-opioid pain relief techniques in LMICs.
- Population: Studies that concentrate on conditions or treatments unrelated to pain management or that include populations outside of LMICs.
- Language: Studies published in languages other than English.

2.4



Source: Page et al. (2021)

2.5 Search Strategy

To exhaustively compile pertinent literature on pain management strategies adopted in LMICs, the search method adhered to strict PRISMA requirements. Because of their vast coverage of medical literature, reputable databases such as PubMed, EMBASE, Scopus, and the Cochrane Library were used to guarantee a thorough search (Page et al., 2021). A methodical merger of keywords and Medical Subject Headings (MeSH) terminology was applied to grasp a wide range of publications focusing on opioid and non-opioid pain management tactics inside low- and middle-income countries. These search terms included synonyms and variants for pain treatment, opioids, non-opioids, LMICs, and other pertinent ideas. This allowed for a more thorough investigation without compromising the specificity of the articles that were retrieved.

The use of Boolean operators such as 'AND', 'OR', and 'NOT' enabled precise combinations of keywords and optimized the search process. This strategy helped us narrow or expand our search and ensure that we found articles that met our specified inclusion criteria. For example, the operator "AND" was used to link phrases related to LMICs with both opioid and non-opioid pain treatment regimens. This combination made sure that the papers that were retrieved talked about both kinds of LMIC pain management techniques. For instance, the search term "opioid AND non-opioid pain management strategies AND LMICs" produced results for publications that addressed both kinds of LMIC strategies in detail.

By adding synonyms or similar phrases, the operator "OR" helped to increase the search's breadth. For example, adding LMIC-related keywords to variations like "non-opioid OR non-narcotic pain management strategies" expanded the search to include a larger range of papers that covered non-opioid tactics in LMICs. Furthermore, the operator "NOT" aided in excluding items that were not pertinent to the study's objectives. For instance, combining phrases like "opioid AND non-opioid NOT high-income countries" allowed for a more concentrated search on LMICs by effectively removing papers discussing these methods just inside high-income countries.

2.6 Data Analysis

About the study data analysis, the information that was retrieved was thoroughly examined and synthesized. The collected data were systematically categorized and analyzed using thematic analysis, as recommended by Braun and Clarke (2006). Using this approach, the most essential and relevant material was extracted from the evaluated literature by carefully identifying and analyzing major themes and patterns. As noted in related systematic reviews in the area, this study made it easier to synthesize an extensive overview of pain treatment techniques that concentrate on both opioid and non-opioid methods in LMICs (Chang et al., 2023; Sohi et al., 2022; Yao et al., 2023a; Yao et al., 2023b).

2.7 Result

In all 19 studies were analyzed. The analyzed research includes a wide range of demographic settings and geographic regions, demonstrating a diversified and worldwide viewpoint around the accessibility, availability, and use of opioids and non-opioids forms of treatment. These studies include a wide range of geographical areas including Afghanistan, Ghana, Pakistan, Kenya, Nigeria and other low- and middle-income nations; they also cover Southern Africa (more particularly, Mozambique, Swaziland, and Zimbabwe). The research included a wide range of demographics, cultural origins, and socioeconomic situations and engaged a variety of population groups, including young people, college students, marginalized women, construction workers, and the public. The authors underscore the complex issues and variables that impact the use of opioid and non-opioid analgesics. These factors include but are not limited to availability, utilization patterns, knowledge gaps, socioenvironmental influences, and impediments associated with the health system.

2.8

Objective 1: Assessment of the availability and utilization of opioid and non-opioid pain management strategies within LMICs

*Table 1.
 Available and Utilisation of Opioids in LMICs*

<i>Author</i>	<i>Methodology</i>	<i>Availability and Utilisation of Opioids</i>
Kurth et al. (2018)	Systematic review using databases (PubMed, CINAHL, SCOPUS, Google Scholar) from 2000 to 2018; focused on opioid use in Africa, resources, and policy needs.	ODU is common, exposing shortcomings in policies and administration to lower transmission.
Sajwani and Williams (2022)	Systematic literature review; quality assessment of studies on THN programs and barriers in LMICs.	Identified barriers impeding opioid availability in LMICs, lack of training, legislative restrictions, and stigma.
Rajagopal et al. (2017)	Analysis of oral morphine use data from Kerala (2012-2015) to describe utilization and geographic disparities.	Oral morphine use has increased, although it is still far less than what is thought to be needed; geographical differences are evident.
Yao et al. (2023)	Scoping review using MEDLINE, EMBASE, and SCOPUS; identified themes related to opioid availability and usage in Sub-Saharan Africa.	Sub-Saharan Africa has severe opioid shortages and a high prevalence of non-opioid analgesic usage as a result of these shortages.
Nelson and Alichie (2023)	In-depth interviews with marginalized Nigerian women with long-term pain to determine obstacles to obtaining reputable sources of opioids.	Due to restrictions on obtaining legal opioids and dependence on unlicensed sources, pathways to opioid abuse have been discovered.
Zandibeni et al. (2023)	An exploratory mixed-method study that includes qualitative surveys with patients, managers, healthcare professionals, and carers, and a descriptive study of opioid availability at hospital pharmacies.	- The stock data for opioid analgesics was frequently of low quality and incompleteness. - Reports of frequent stock-outs. In 2020, there were data on opioid prescriptions at just five hospital pharmacies.

The results of several research on the availability and use of opioids in LMICs point to a concerning and complicated situation. When taken as a whole, these studies provide a disturbing picture of the difficulties in offering and gaining access to opioid-based pain management techniques in these areas.

Research such as those of Rajagopal et al. (2017) and Kurth et al. (2018) draw attention to important problems with resource management and policy. Kurth et al. have brought attention to the prevalence of Opioid Use Disorder (ODU) in Africa, which highlights the shortcomings in policy frameworks and resource management. This illustrates the breadth of opioid abuse as well as the deficiency of effective legislative controls on the distribution and use of opioids. Oral morphine use has increased in Kerala, according to Rajagopal et al.'s data, although it is still far less than what is thought to be needed. This indicates inefficiencies and geographical differences in the provision of necessary painkillers.

The severe opioid shortage was highlighted by Yao et al. (2023) and Zandibeni et al. (2023). The acute lack of opioids in Sub-Saharan Africa has made non-opioid analgesics more widely used since they are more difficult to find. These replacements might be harmful to your health and provide insufficient pain relief. Hospital pharmacies were found to have recurring stock-outs and inconsistent stock data by Zandibeni et al. This suggests deficiencies in operations and logistical problems, which may be part of the reason why opioids are scarce in certain environments. The difficulties people have obtaining legal opiates have been highlighted by Nelson and Alichie (2023), necessitating their reliance on unauthorized suppliers. This highlights regulatory shortcomings and puts vulnerable people at risk of abuse and dependency.

In summary, all the findings indicate systemic problems, such as inadequate policies, regional differences, logistical difficulties, and regulatory flaws, which limit the availability of opioids for pain relief in LMICs. To enable equal availability to necessary pain management measures, addressing these concerns requires substantial reforms in policy, budget allocation, regulatory systems, and logistical management. If these shortcomings are not addressed, people who require effective pain management may continue to suffer, and the abuse and reliance on possibly less effective alternative pain relief treatments may worsen.

Table 2
Available and Utilisation of Non-Opioids in LMICs

<i>Author</i>	<i>Methodology</i>	<i>Availability of non-opioid</i>	<i>Level of Utilization</i>
Jamiu et al. (2017)	Six hundred and thirty (630) Ilorin inhabitants were surveyed; chi-square and logistic regression analyses were performed.	There are non-opioid analgesics available, however, 65.9% of people are not aware of their negative effects.	Significant usage is demonstrated by the frequency of improper use (34.3%) and self-medication (21.1%).
Badzi and Ackumeh (2017)	Two hundred and six (206) construction workers participated in cross-sectional research with chi-square analysis.	There are non-opioid analgesics (such as those made locally) yet only 31.6% of people are aware of their potential negative effects.	Significant usage was demonstrated by the majority of users (68.0%) of the analgesic produced locally.
Fidelis et al. (2017)	Two hundred and five (205) medical professionals in the city of Sokoto were surveyed; an SPSS analysis was done.	Analgesics that aren't opioids are commonly accessible from a variety of sources (such as patent medicine stores).	The majority (85.9%) self-prescribe non-opioid analgesics, especially for headaches (63.9%), demonstrating high use.
Niguse and Sosengo (2021)	An institution-based cross-sectional study was utilized	Ninety-five percent of the participants had ever taken analgesics. - Ibuprofen, Diclofenac, and Paracetamol were often used analgesics. - Knowledge of possible side effects, such as liver damage from excessive paracetamol dosages. - Understanding drug interactions, such as avoiding alcohol when taking paracetamol.	- Headache, menstruation pain, fever, experience, publications, and suggestions from other people are the reasons for using it. Substantial percentages of participants lacked the necessary expertise.

Analyzed findings on the availability and use of non-opioids in LMICs raise several important questions about the approaches to pain management used in these areas. The results show a situation in which non-opioid analgesics are accessible, but there are still problems with knowledge, comprehension, and usage habits, highlighting some difficulties.

Based on the findings of Jamiu et al. (2017) and Badzi and Ackumeh (2017), there is a serious dearth of knowledge on the drawbacks of non-opioid analgesics. According to Jamiu et al., a significant percentage of respondents in Ilorin (65.9%) were not aware of the possible side effects of these drugs, while Badzi and Ackumeh found that 31.6% of Ghanaian construction workers also did not know about these side effects. Concerns over the possible hazards people may be exposed to because of incorrect or ignorant use of these drugs are raised by this lack of information.

Both Niguse and Sosengo (2021) and Fidelis et al. (2017) reported high non-opioid analgesic usage rates across various groups. The results showed that most individuals, especially for diseases like headaches, tended to self-prescribe and use these prescriptions. But Niguse and Sosengo's investigation revealed some concerning findings as well. A sizable portion of participants were found to be ignorant of important information regarding these analgesics, such as possible interactions and adverse effects. A sizable percentage of people have this knowledge gap, which increases the possibility of poor management and unfavorable outcomes because of insufficient comprehension.

In conclusion, although nonopioid analgesics are readily available and commonly used for pain management in LMICs, research shows that there are significant gaps in public knowledge and understanding of non-opioid analgesics. is highlighted. Due to a lack of education and comprehension of these non-opioid pain management techniques, people may be at risk for incorrect use, adverse effects, and problems. To guarantee non-opioid analgesics' safe and efficient use in pain treatment in LMICs, it is imperative to close these knowledge gaps and improve public education and awareness about them.

The critical differences between the availability and utilization of opioids and non-opioids in LMICs in the analyzed studies:

Opioids:

- In LMICs, especially in areas like Sub-Saharan Africa, severe shortages of opioids have been brought to light.
- Legislative limitations, a lack of expertise, and inadequate stock data that frequently caused shortages were among the obstacles to availability.
- One route to opioid abuse has been identified: dependence on unlicensed sources because of limitations on getting authorized opioids.

Non-Opioids:

- In LMICs, non-opioid analgesics were easily accessible.
- It is concerning to note that a sizable segment of consumers were ignorant of the side effects associated with non-opioid analgesics.
- Due to a lack of knowledge, people began self-medicating and using drugs improperly, which raised possible health hazards.

The contrast between the availability and utilization of opioids and non-opioids in LMICs presents a critical dichotomy in pain management. This discrepancy accentuates the pressing need for balanced strategies: addressing opioid shortages in LMICs while concurrently enhancing education and awareness on the appropriate use of non-opioid pain relief alternatives to ensure safe and effective pain management practices.

Objective 2: Analysis of the disparities in the challenges in access to and adoption of these strategies within resource-constrained environments

*Table 3.
 Factors Affecting Availability and Utilization of Opioids*

<i>Author</i>	<i>Sample or Study Area</i>	<i>Factors Affecting Availability of Opioids</i>	<i>Factors Affecting Utilization of Opioids</i>
Morriss and Roque (2018)	HICs & LMICs	Inadequate data/research, unequal access to analgesics, low understanding and attitudes, low priority given to pain management, and differences in the world's opioid usage.	Patient fatalism, inadequate training for healthcare professionals, shortcomings in the broader healthcare system, cultural norms, financial obstacles, and a lack of available treatments.
Iqbal et al. (2023)	Pakistan	There is a dearth of research on the elements that precede opioid usage, which include policy practices, commodity management techniques, human resource practices, and the prudent use of opioids.	Techniques to address issues that impact access to opioids and lead to the misuse of opioids.
Gathit et al. (2017)	Nyeri County, Kenya	Commodity management, sensible usage, and human resource procedures are important variables. Access to opioids was not significantly impacted by palliative care policies.	Access to opioids is greatly influenced by human resource practices, commodity management, and rational usage. It is also necessary to develop the competencies and abilities of human resources.
Alhassan (2022)	West Africa, Ghana	Theoretical justifications for youth's structural use of tramadol emphasize the agony that precedes the misuse of the drug, government reactions, user interviews, and the difficulties in comprehending tramadol usage.	The need for a harm reduction strategy stem from structural violence, moral panic theories, anxiety, displacement, and work-related causes for tramadol usage.
Danso and Anto (2021)	Accra Metropolitan Area, Ghana	factors linked to commercial drivers' and helpers' misuse of tramadol. Age, conflict in the family, drug misuse by family members or acquaintances, and the purpose of use (pain alleviation, sexual enhancement) are risk factors.	High prevalence of misuse and tramadol dependency, as well as the necessity for interventional programs and socioenvironmental variables that influence abuse.
Namisango et al. (2018)	Mozambique, Swaziland, Zimbabwe (Southern Africa)	law governing regulated drugs that is unduly stringent; knowledge gaps about opiate prescriptions, storage, and distribution; severe prescriber shortage; Environmental constraints imposed by law	Key papers with stigmatizing wording; imprecise methods for estimating opioid usage; high financial costs that patients must pay out of pocket; Recommendation for an action plan including administrators, legislators, and service providers
Haidary (2015)	Kabul, Afghanistan	Opioids are easily obtained and inexpensive; they are also widely used; and they are sourced from drug traffickers and other users.	- Individual characteristics: young age (15–22 years), lack of education, history of snuff usage or cigarette smoking, and use of opium for pain alleviation - Behavioural: Constant exposure to drugs, peer influence, and pressure Social: Family issues and strained relationships, tensions due to the conflict, drug usage among friends and family Economic: Migrant labour, demanding employment, job insecurity, unemployment, and inadequate preventive and therapeutic initiatives

The availability and utilization of opioids in LMICs are influenced by a variety of circumstances, as Table (3) above illustrates. These characteristics have significant consequences for the efficient treatment of pain. The restricted availability of opioids in both high-income and LMIC contexts is mostly caused by inadequate data, uneven access to analgesics, and diverse worldwide opioid consumption patterns (Iqbal et al., 2023). The appropriate consumption of available opioids is hampered by several factors, including patient fatalism, insufficient training for healthcare professionals, systemic flaws, cultural norms, financial constraints, and restricted treatment alternatives (Gathitut et al., 2017). These factors further exacerbate the shortage of opioids. Furthermore, structural explanations for opioid misuse—especially for medications such as tramadol—emphasize the role that preexisting pain played in the development of abuse, in addition to socioenvironmental factors like age, family conflict, peer pressure, and socioeconomic difficulties (Alhassan, 2022; Danso & Anto, 2021). These results highlight the need for an all-encompassing, multifaceted strategy that addresses institutional, cultural, and individual variables to advance opioid availability and responsible use in LMICs, which is essential for efficient pain treatment (Namisango et al., 2018).

Table 4.
Factors Affecting Availability and Utilization of Non-Opioids

<i>Author</i>	<i>Sample/Study Area</i>	<i>Factors Affecting Availability of Non-Opioids</i>	<i>Factors Affecting Utilization of Non-Opioids</i>
Badzi and Ackumey (2017)	Ghanaian construction workers in the Ga-East Municipality in the Greater Accra area	Insufficient knowledge about the use of analgesics and their harmful adverse effects. The impact of radio and television commercials.	- Insufficient understanding of potential harmful side effects. The impact of radio and television commercials.
Kawuma et al. (2021)	Sub-Saharan Africa	sources: family, friends, pharmacies, and pharmacy stores; obstacles to accessing health services	common usage for fever and headaches; information from neighbors, relatives, and friends; more prevalent in women, elderly people, and those with less education

Badzi and Ackumey (2017) noted a common lack of knowledge about the use and potential side effects of non-opioid analgesics among Ghanaian construction workers based on the data in Table 4. The way that people perceived and were aware of these analgesics seems to be greatly influenced by the mass media, particularly by radio and television ads. The sources of non-opioid analgesics were found to be pharmacies, drugstores, acquaintances, and family in a separate study conducted in Sub-Saharan Africa by Kawuma et al. (2021). Significant barriers to healthcare services were observed, nevertheless, indicating possible difficulties in receiving appropriate medical advice. The frequent use of non-opioid analgesics for fever and headaches, combined with information from friends and family, particularly in the case of women, the elderly, and those with lower educational attainment, suggests that self-medication and reliance on unofficial networks for healthcare advice are commonplace in these communities.

These results point to the critical need for enhanced teaching programs that increase public knowledge of non-opioid analgesics and any associated risks. Better access to formal healthcare facilities and increased healthcare literacy may also help reduce the need for unofficial sources of medical knowledge and address the problem of non-opioid analgesic self-medication. The potential for precise and focused health messaging to improve knowledge and safe use of non-opioid analgesics in LMICs is also implied by the influence of mass media in forming views.

The critical differences between the factors affecting the availability and utilization of opioids and non-opioids in LMICs in the analyzed studies:

Opioids:

Availability:

- Challenges include disparities in the use of opioids throughout the world, insufficient data and research, unequal access, and a low emphasis placed on pain management.
- Lack of information and awareness, together with cultural norms and budgetary constraints, are the root causes of availability problems.

Utilization:

- Patient fatalism, a lack of treatment alternatives, systemic inadequacies, and inadequate training for

- healthcare professionals are some of the factors that impact utilization.
- Systemic problems, moral panic, and social factors like fear and relocation all have an impact on misuse.

Non-Opioids:

Availability:

- Lack of knowledge of analgesics and its associated side effects, which are impacted by media influence (TV and radio ads), is one of the availability challenges.
- Non-opioid analgesics are easier to obtain from friends, family, and pharmacies, but formal health services are more difficult to reach.

Utilization:

- Usage patterns show that people frequently use medications for fever and headaches, especially women, the elderly, and those with lower levels of education. These medications are obtained from friends, neighbors, and family members.

These distinctions draw attention to the variety of factors influencing availability and usage, highlighting the necessity of all-encompassing approaches that address institutional, educational, and cultural elements for pain management that work in LMICs.

3. Implications for Balancing Pain Management Best Practices

3.1 Opioids' Availability Challenges vs. Non-Opioids' Accessibility

The stark difference in the availability of opioids compared to non-opioids highlights the need for a well-rounded approach. While non-opioids are more widely available yet have less knowledge of their negative effects and are obtained informally (Fidelis et al., 2017; Jamiu et al., 2017), opioids are subject to global inequities, inadequate data, and cultural obstacles that affect their availability (Kurth et al., 2018 Sajwani & Williams 2022). This emphasizes the necessity of targeted intervention, such as improving knowledge and formal healthcare accessible for non-opioid users while also guaranteeing improved accessibility to opioids.

National Academies of Sciences et al. (2017b) state that inadequate and vulnerable to collapse due to a lack of comprehensive support for alternatives are the current strategies for improving prescriber education on pain management and opioid misuse, especially initiatives like the NIH CoEPEs. Nevertheless, the National Academies of Sciences et al. (2017b) stress that any nation's national strategy for requiring pain-related medical education must undergo a substantial paradigm change. It claims that these constrained educational resources are insufficient and criticizes the widespread dependence on quick online programs. Rather, Holliday et al. (2017) support the recommendation, which calls for a more thorough and significant change in medical education about pain management. This recommendation advocates for a more comprehensive educational approach to effectively manage pain and the challenges associated with opioid prescription. One such recommendation advises investing in research to enhance understanding in three key areas: pain's neurobiology, non-addictive pain treatments, and the relationship between pain and opioid use disorder, emphasizing the need for innovative, individualized, and effective pain management strategies (National Academies of Sciences et al., 2017c).

3.2 Utilization Disparities

The differences in how opioids and non-opioids are used highlight different patterns of usage. Systemic issues with opioids that prevent them from being used appropriately are brought to light by things like patient fatalism, poor treatment options, and inadequate training for medical personnel (Morriss & Roque, 2018; Iqbal et al., 2023). On the other hand, non-opioids are often utilized, especially for certain conditions including fever and headaches, and are frequently obtained unofficially from friends and family (Badzi & Ackumey, 2017; Kawuma et al., 2021). To even out this disparity, all-encompassing strategies that prioritize medication use monitoring, more formal healthcare access, and education are required.

Multimodal techniques can be used in interventions that attempt to address the differences in opioid and non-opioid use in low- and middle-income countries. These might include teaching programs that emphasize the correct use and possible adverse effects of non-opioid analgesics, to raise knowledge and comprehension of them (Jamiu et al., 2017; Badzi & Ackumey, 2017). Enhancing access to and provision of official healthcare services might lessen the need for non-opioid sources that are obtained informally (Kawuma et al., 2021). To guarantee their appropriate utilization while addressing systemic difficulties impacting their availability, extensive education on opioid consumption, safety, and appropriate pain management measures is essential (Morriss & Roque, 2018; Iqbal et al., 2023). To promote safe and fair access to both kinds of pain treatment options and to

balance their usage in low- and middle-income settings, these initiatives should be combined with legislative and policy measures.

3.4 Need for Multifaceted Approaches

The multifaceted challenges revealed in these studies (e.g., (Badzi & Ackumey, 2017; Kawuma et al., 2021; Morriss & Roque, 2018; Iqbal et al., 2023; Gathitut et al., 2017; Alhassan, 2022; Danso & Anto, 2021; Namisango et al., 2018; Haidary, 2015) underscore the necessity for comprehensive strategies. These demands addressing systemic inadequacies, regulatory flaws, and logistical problems affecting opioid availability while simultaneously focusing on enhancing public knowledge, formal healthcare access, and healthcare literacy for non-opioids. A well-rounded approach is necessary to ensure effective pain management that caters to the specific needs and challenges of LMICs.

4. Concluding Remarks

The collective body of evidence gleaned from this comprehensive systematic review of literature underscores the intricate challenges and disparities ingrained within the global landscape of pain management in LMICs. The disparities in the availability and use of opioids and non-opioids highlight the critical need for a comprehensive, multifaceted strategy. It is critical to address the discrepancies in opioid accessibility, which include inadequate data, uneven access, and cultural obstacles. In addition, it is crucial to make sure that formal healthcare is accessible, that education is improved, and that non-opioid consumption is closely monitored. This synthesis of varied viewpoints forces the need for targeted interventions that bridge policy, education, healthcare systems, and public perception to close the gaps that now exist. The synthesis serves as a clarion call for a paradigm shift in global pain management strategies, compelling a unified effort towards comprehensive, equitable, and effective pain relief approaches in resource-constrained settings.

The research is limited by the variety of the studies examined, which offers a thorough perspective but also raises the possibility of a lack of standardization between research methods, which might compromise the comparability of results. But the review's greatest gift is its diversity, which offers a rich tapestry of viewpoints from different social contexts, demographics, and geographic regions. This variety adds to our understanding of the complex issues surrounding pain care in LMICs by illuminating subtle variables influencing the availability and use of both opioid and non-opioid medications.

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