



Thematic evolution and determinants of patient acceptance of generic medicines: A systematic review and bibliometric analysis with special reference to India

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ABSTRACT

The article focuses on the thematic evaluation of generic medicine and identifies the factors that are responsible for patients accepting the same by patients. A total of 1,035 full-length articles were considered from the Scopus database from 1973 to 2024, and systematic literature was performed as per the guidance of PRISMA framework. The findings of the study indicate that misconception and misperception are the main two factors that hamper patient acceptance towards branded medicine over its generic counterpart. Other factors such as cost, prior experience medicine severity also plays a supportive crucial role in patient's choice. In spite of multiple government initiatives worldwide, particularly in India, where health expenses are very high with limited insurance coverage, the awareness of generic medicine is less, which leads to therapeutic non-adherence. The current review highlights that although India is the largest supplier of generic medicine globally, its domestic consumption is less due to concerns related to trust, professional recommendation, and quality. The study highlights the urgent need to educate people and involve healthcare professionals to clear up misunderstandings about generic medicines. By educating the patient by showing the value of generic medicine over branded drug, without any compromise in safety, healthcare systems can encourage better medicine use, lower treatment costs, and make essential drugs more accessible to everyone.

1. INTRODUCTION/BACKGROUND

India, the world's most populated country, faces many health problems and has a healthcare system that is poorly organized, lacks development, and enough funding [1–3]. With just 1.25% of GDP, India spends the least on public healthcare expenditures. Even though it has decreased, out-of-pocket expenditures still account for 58.7% of total health expenditures, which was 74% in 2001 and 55% in 2019 [4–8]. The insufficient out-of-pocket expenditures can be explained by the low health insurance coverage and inadequate access to essential medicines,

which range from 17% to 51% across states. Thus, the need for affordable healthcare becomes a priority [5,6,9].

In low- and middle-income countries, the use of generic medicines can significantly reduce healthcare expenditures without compromising access to medicines [2,9–11]. The WHO defines generics as “a pharmaceutical product, usually intended to be interchangeable with an innovator product that is manufactured without a license from the innovator company and marketed after the expiry date of the patent or other exclusive rights” [12]. Generics must be shown to be therapeutically equivalent and interchangeable in the active ingredients, safety, and efficacy of the innovator products, and differ only in the physical form and inactive ingredients [12–14].

The Indian pharmaceutical industry, known as the “Pharmacy of the World,” is the largest supplier of generics in the world and exports to over 200 countries, accounting for 20% of

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the world's exports and 16%–18% of the world's generics [2,15–17]. Between 2016 and 2020, the sector experienced a Compound Annual Growth Rate growth of 8.7%–10.53% while the global market was projected to reach 150 billion dollars by 2020 [2,18].

Even though the generic market is growing and makes up 20% of all exports, India is still having trouble finding high-quality medicines [2,15–18]. The increased use of generic medicines has been demonstrated to lower medical expenses and is essential to the long-term sustainability of the healthcare system [16]. Therefore, many national governments and third-party payers have launched and implemented a variety of policies, initiatives, and strategies to encourage the use of generic medicines as an essential component of the healthcare system in order to combat the rising costs of healthcare in general and pharmaceutical costs in particular [17,18].

Despite the government's best efforts through policy and schemes like Pradhan Mantri Bharatiya Janaushadhi Pariyojana 37 (PMBJP), the usage of generic medicines is not widely accepted in India [12,19]. Patients' adoption of generic medicines is noteworthy since they are the ones who use these pharmaceutical products in the end. To be sure, patients must have positive attitudes and awareness before they can accept generic medicines [19]. Research identified disease, experience, and cost, along with recommendations made by providers, as the main drivers behind patient decision-making towards generic medicine [9,12,20]. The lack of studies focusing on thematic progression and behavioural factors, in particular, patient adherence, is puzzling, as existing literature provides valuable insight only into physician and patient perspectives [12,21,22].

The current review bridges this gap by systematically performing a bibliometric analysis on 1,035 articles indexed by Scopus, dated from 1973 to 2024. It documents the development of major themes of bioequivalence, drug commercialisation, patient attitude, and legislation, and maps the most prominent scholars, journals, and networks of collaboration that have framed the conversation on generic drugs, particularly in the context of healthcare in India.

2. RESEARCH QUESTIONS

The study focused on addressing the following research questions.

- RQ1. How has the concept of generic medicine evolved from 1973 to 2024, and what have been the major shifts in scholarly focus?
- RQ2. What notable themes emerged during the study period in relation to drug marketing, bioequivalence, and the perception of patients towards generic medicines?
- RQ3. What are the most influential works and journals in the field of generic medicine?
- RQ4. How do factors such as price, effectiveness, safety, and prior experiences as a whole influence patients' choice of generic medicines?
- RQ5. What do patients' perceptions, attitudes, and awareness regarding generic medicine stand in the way of in terms of acceptance and usage?
- RQ6. What is the influence of doctors and pharmacists on the patients' willingness to use generic medicines, and how is this done through advice and information given to patients?

3. RESEARCH METHODOLOGY

This research employs a Systematic Literature Review (SLR) approach to explore how studies on generic medicines have developed thematically between 1973 and 2024, emphasizing the key factors that shape patient choices. Publications were retrieved from Scopus using the search string:

TITLE-ABS-KEY("Generic Medicine" OR "Health care spending" OR "name-brand drugs" OR "PMBJP") AND (EXCLUDE (DOCTYPE,"re") OR EXCLUDE (DOCTYPE,"ch") OR EXCLUDE (DOCTYPE,"cp") OR EXCLUDE (DOCTYPE,"no") OR EXCLUDE (DOCTYPE,"ed") OR EXCLUDE (DOCTYPE,"sh") OR EXCLUDE (DOCTYPE,"le") OR EXCLUDE (DOCTYPE,"bk") OR EXCLUDE (DOCTYPE,"er")) AND (LIMIT-TO (LANGUAGE,"English")) AND (LIMIT-TO (PUBSTAGE,"final"))

To ensure relevance, only final peer-reviewed English-language journal articles reporting original empirical results were included. With the exclusion criteria, the removed reviews, book chapters, conference proceedings, editorials, surveys, correspondence, and errata.

The initial search produced 3,446 records, which were further refined through a PRISMA protocol (refer Fig. 1). Through Screening, deleted duplicates ($n = 355$), non-English articles ($n = 125$), in-press articles ($n = 10$), irrelevant documents ($n = 1,008$), and non-journal publications ($n = 913$), resulting in 1,035 publications for analysis. R using Bibliometrix and the Biblioshiny interface allowed for a mix of qualitative and quantitative data analysis, including thematic analysis, mapping of emerging themes (drug promotion and patent conflicts, bioequivalence, perceptions, economic impact), publication and author/journal attribution trends, ranks, and various forms of lexical visualisation, including word clouds.

While the reliance on Scopus and English-only sources may limit global inclusivity, the review provides a comprehensive synthesis of five decades of literature, charting a trajectory from early debates on formulation integrity and promotion to contemporary concerns with patient outcomes, safety, and cost-effectiveness.

4. LITERATURE ON GENERIC MEDICINE

The literature on the topic of generic pharmaceuticals has progressed on several fronts, including but by no means limited to bioequivalence, pricing, regulations, and attitudes of the patients. Initial contributions like [9,12,14] laid the groundwork by arguing that the quality, safety, and efficacy of generic pharmaceuticals are above the minimum standards, and justifying the reason why the public continues to distrust them. Studies [23–26] documented a lack of awareness, entrenched misconceptions, and the need for education and regulation that was implemented in a culturally relevant manner and in a manner that was visible in Malaysia, Iraq, and Afghanistan. In a comparable manner, [27–29] discussed the lack of uptake in Europe because of economic and poorly structured policies in reference to tiered pricing and demand-side policies.

Even though bioequivalence has been proven through meta-analyses and systematic reviews [30], there is still patient-level distrust, lack of adequate professional guidance, and

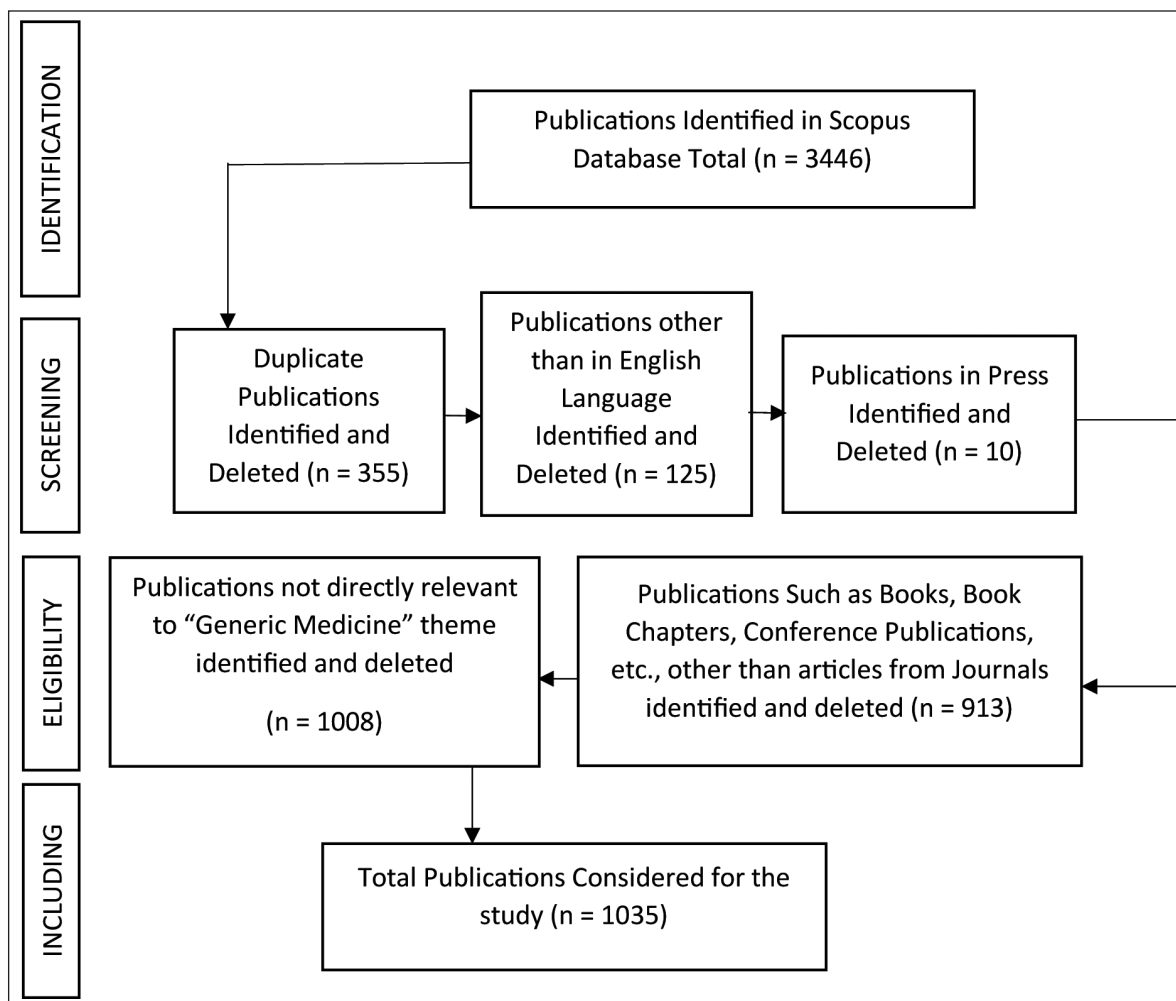


Figure 1. PRISMA flow chart for data filtering and screening; Source: Authors.

consequently lack of acceptance in countries like India [23,31]. Unpublished and published studies [32–39] have documented systemic challenges like patent clustering, unregulated markups, and pharmacist indecision, whereas [23,40–44] discussed prescriber reluctance and South Asian and Gulf pricing disparities.

These provide useful insights, but the literature is still unintegrated and, in some cases, poorly so, particularly on the nexus of bibliometric influences and behavioural factors. For example, “drug cost,” “drug safety,” and “drug quality” dominate the author word clusters (Fig. 6), but there is little data quantifying and contextualising lost patient-terms. Additionally, the thematic evolution (Fig. 7) analysis demonstrates a shift from a focus on systemic, product-level issues to broader structural issues, but very few studies seek to address the barriers to improve the uptake of generics in India.

4.1. Annual scientific production

Figure 2 illustrates the annual scientific production on generic medicine from 1973 to 2024.

Over time, the overall number of publications has increased consistently, with a significant surge starting around

1990. This pattern reflects an increasing focus and scholarly engagement with generic medicines. The steady rise shown by the linear trend line points to ongoing and continuous development in research within this domain.

4.2. Top journals publishing about generic medicine

Figure 3 shows the top journals publishing on generic medicine from 1973 to 2024, based on the count of articles publications in each journal during this period. The Journal of Generic Medicines leads with 45 publications, followed by BMC Health Services Research with 22, PLOS ONE with 19, and the Journal of Pharmaceutical Policy and Practice with 18 publications. Other notable journals include Health Policy with 15 publications, GABI Journal with 14, and Research in Social and Administrative Pharmacy with 13. Both the International Journal of Clinical Pharmacy and The Pharmaceutical Journal contribute 12 publications each, while Atención Primaria accounts for 10 publications. The spread of publications shows that research on generic medicines covers a wide variety of themes and viewpoints, with studies appearing in many different journals. This reflects the broad and evolving interest in the field.

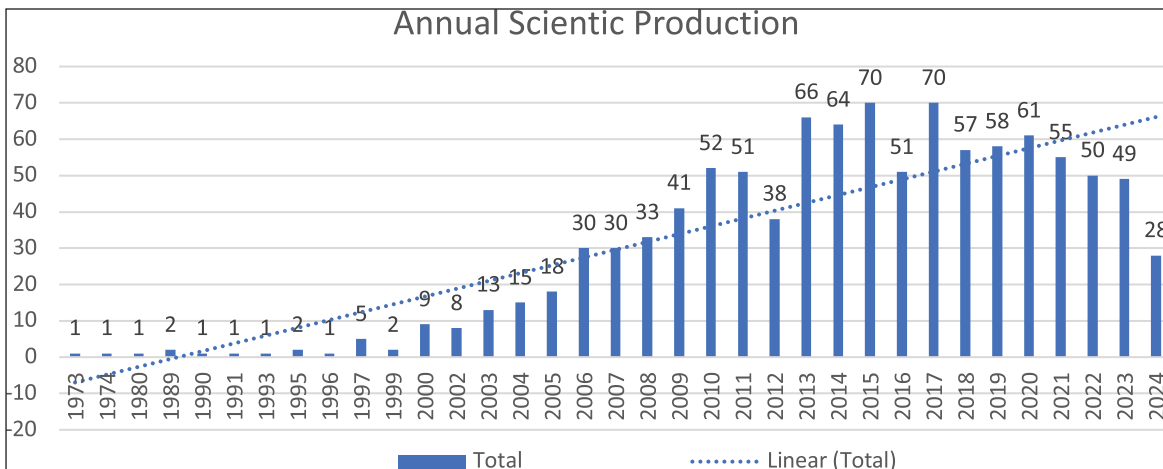


Figure 2. Annual scientific production on generic medicine; Source: Authors.

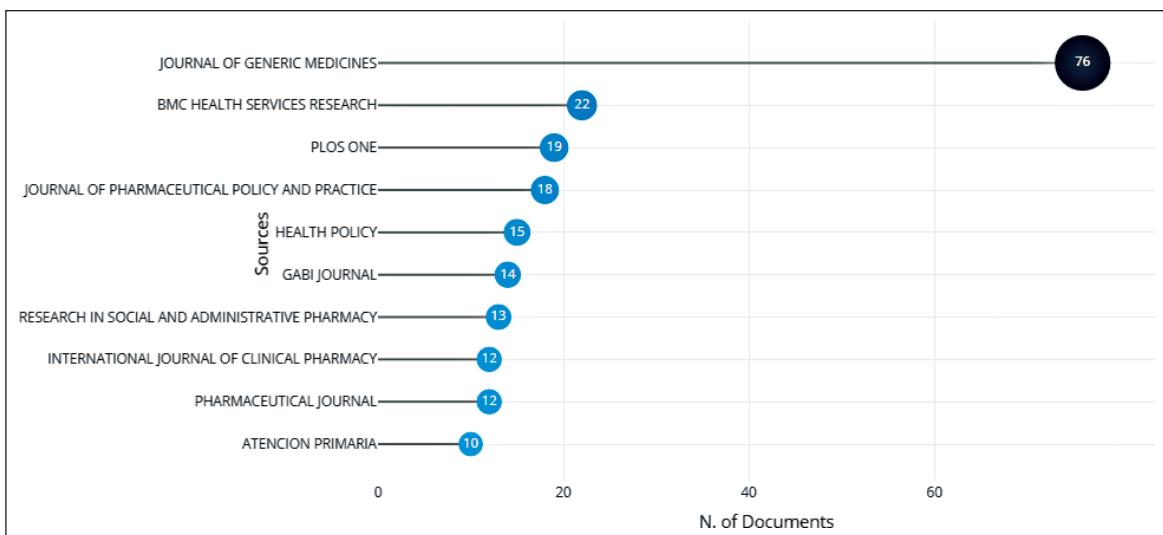


Figure 3. Top journals publishing about generic medicine; Source: Author.

4.3. Top authors publishing on generic medicine

In Figure 3, the top authors who have written on the topic of generic medicines over the years are outlined and ranked according to their published works. The most prolific among them, with 53 works published, is Hassali, who, alongside many of his collaborations, has worked on patient perception and the understanding and cultural attitudes toward health in Malaysia, Iraq, and Afghanistan. In his study [26], Hassali found that almost half of the people in Malaysia who were surveyed were not aware of generics and were under the impression that generics are not effective. Similarly [27], in Iraq, the public’s knowledge of generics was described as dim, while [28], in Afghanistan, concentrated on the student population who appreciated the inexpensive generics but were doubtful of their quality. In all of these instances, Hassali advocates for public and professional education, regulatory transparency, and culturally appropriate policy change to improve the acceptance of policy barriers.

In total, Simoens has written 34 works and has researched primarily on the economic and regulatory issues surrounding generics in Europe. In his work [29], he described the slow uptake of generics in the elderly population as strangely low, while [30] focused on the 27 European countries and calculated the potential savings that could be achieved, noting the need for reform in demand-side incentives for prescribers, dispensers, and patients. In [32], he analysed the pricing and reimbursement policies in generic medicines, proposing the policy of unbundled and tiered delinked pricing as a means to monopolise the generic medicines market. Overall, his work illustrates expansive control over the price of medicines, affordability for the public, and regionally coordinated efforts on policies for Europe.

Policy and pricing-oriented research gives Ibrahim MIM (22 publications) and his contributions [33,34] documented sizeable gaps where patent clustering and bureaucratic inefficiency have stagnated the availability of

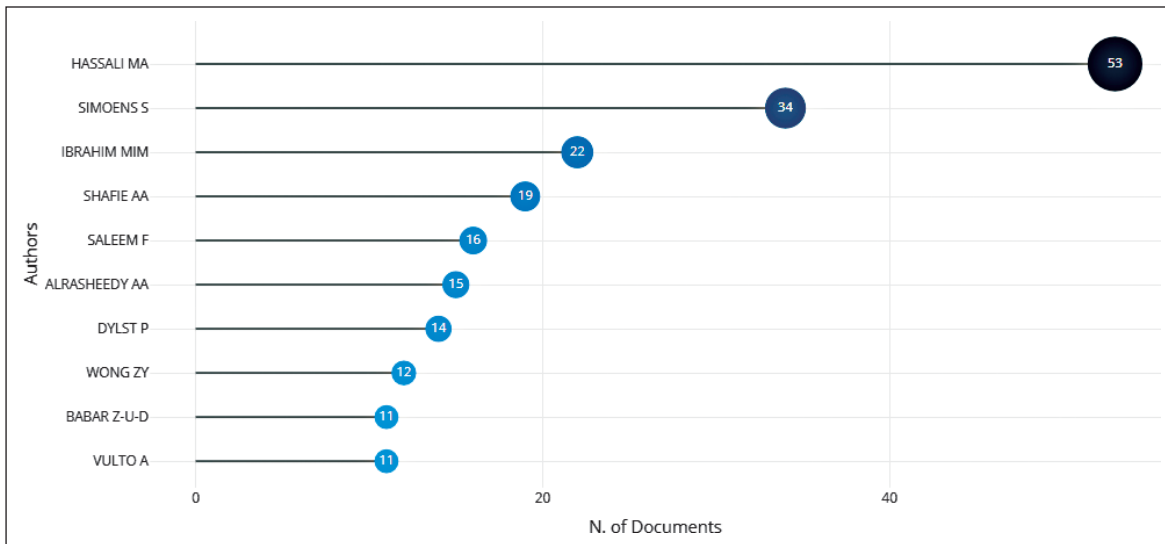


Figure 4. Top authors publishing on generic medicine; Source: Authors.

generics in Malaysia. His discovered unregulated markups in [35], however, advances the debate at hand on the pressing need for national pricing policies. In his investigated perception studies [36], Ibrahim found contradictory notions of trust, understanding, and the need for evidence-based substitution tools among pharmacists and patients. It is irrefutable, however, that his research on the topic illustrates the need for regulatory reform, stakeholder engagement, and reformation of educational aspects.

Substitution, pricing, and perception were described in the works of Shafie (19 publications). Most prominent for him is the finding that students in Asia were supportive of, but uninformed about, bioequivalence [37]. In Malaysia, pharmacists were found who generically prescribed medication, but who were also unsure about the interchangeability and the level of control standards [38,39]. In [40], pricing disparities were evident, with some local generics paradoxically costlier than imports. His work consistently points to knowledge gaps, regulatory opacity, and the need for targeted education and clearer substitution guidelines.

Saleem in his 16 publications focuses on the outpatient prescribing practices and the barriers to prescription drug access in the South and South East Asia and South Asia region. Wong *et al.* [41] and Kumar *et al.* [42] evidenced the physician doubts in the quality of and ignorance of the approval processes in the private sector of some countries, such as Malaysia. Educational strategies such as in [43] proved that within a single lecture, there can be a marked improvement in the physicians' understanding about the critical clinical concepts of bioequivalence and safety. As for Afghanistan, [28] describes the position of some pharmacists as cautious optimists who had some nagging doubts about the reliability of the supply. Saleem advocates for district-level policies on substitution and advocates for greater national transparency.

Alrasheedy [44] (15 publications) focuses on the value of a medication and substitution at the Gulf level [44] studied the Gulf of Saudi Arabia and the region's pricing and economically

analysed Saudi Arabia's pricing policies and pricing systems, and found regions of incongruence where the imported generic was sometimes lower priced than the local. He also proposed the creation of a national formulary to encourage substitution and to boost confidence among pharmacists, which is currently are described as economics of medication equivalence [16]. His collaborative studies in Malaysia [41,42] described the concepts regarding safety that some physicians hold and demonstrated that physician attitude change is possible through education.

The publications of the authors above show that the research on generic medicines covers a number of major regions and many different aspects, yet almost all major aspects are the same: lack of education concerning generic medicines, lack of trust in the quality of generics, pricing, and regulatory barriers, all inadequacy of the system, and the need for education and systemic change.

The works of Hassali, Simoens, and Ibrahim show that the themes of "drug cost," "bioequivalence," and "patient perception" along with their bibliometric prominence, reflect the changing factors that shape patient decision-making. This calls for action to bridge the gap between academic knowledge and practical barriers to understanding and intervening in the low uptake of generic medicines.

4.4. Collaboration of country wise authors

Figure 5 showing author collaborations indicates that India's lead in publications on generic medicines is followed by the USA and Malaysia. Both single and multicountry studies show active international cooperation. India's local problems are critical gaps in research driven by these global efforts. International bioequivalence, safety, and regulation research characterised by studies [12,43] is certainly Western dominated. The work of [33,34,37] and work cited in [28,45] show developing country persistent pricing regulatory inefficiencies and unresolved knowledge gaps in South and Southeast Asia healthcare systems, respectively. Meta-analyses like [46] confirm bioequivalence, but very few studies

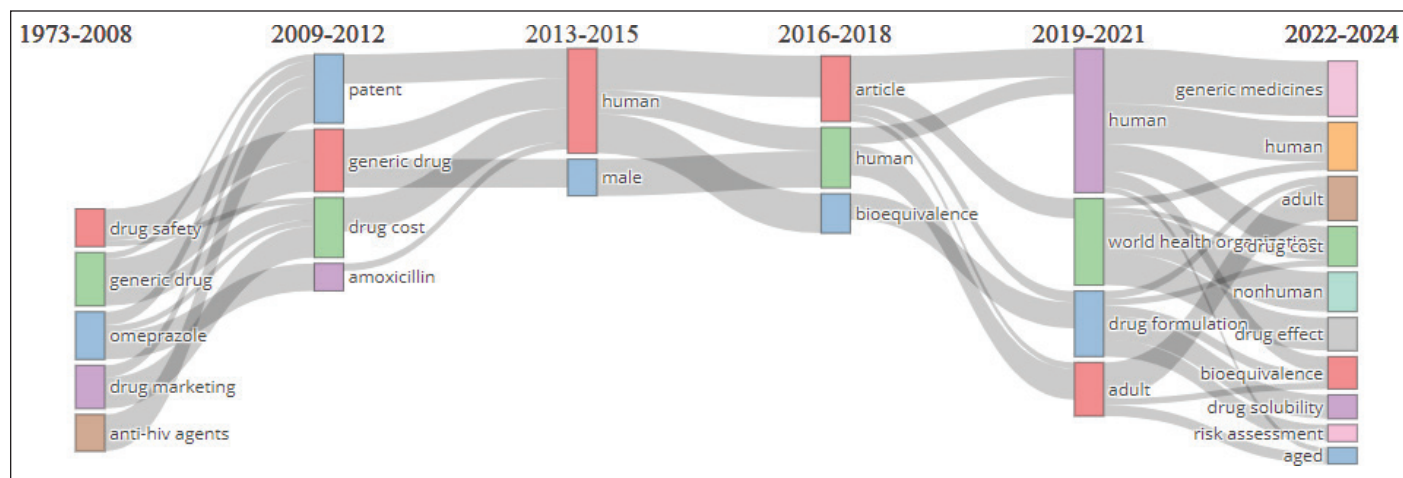


Figure 7. Thematic evolution; Source: Authors.

substantial shifts in focus areas. In the initial stage of the research (1973–2008), the focus was on certain drugs like omeprazole and anti-HIV drugs, while the burgeoning marketing of drugs showed the emergence of generics in competing markets. Figueiras *et al.* [48,49] constructed and validated a scale on generic medicines and assessed the generic beliefs, which indicated early public skepticism regarding generics, especially concerning their perceived efficacy and safety.

From 2009 to 2012, the focus was on regulation and the economics of the research, particularly on drug patenting and the price of drugs. Fatokun *et al.* [34] analysed the generic medicines policy in Malaysia in terms of the time taken to enter the market, illustrating how patenting processes obstruct market entry, and thereby price control. Ngo *et al.* [50] investigated the attitudes of patients with epilepsy to generic drugs and their substitution for anti-epileptic drugs, discovering a deficit of knowledge and discordant attitudes regarding therapeutic equivalence, which pointed to a lack of necessary education and information.

In the period 2013 to 2015, the thematic focus of research was more on the clinical side and on the people and their characteristics. Jamshed *et al.* [37] explored the attitudes of final-year pharmacy students in Pakistan towards generic medicines and found a high degree of ignorance and a low level of comprehension about generic medicines among prospective health practitioners. This period showed the beginning of attention to, though far from enough, socio-demographic aspects of the use of generic medicines.

Between 2016 and 2018, bioequivalence, prescription costs, and human-related issues emerged at the forefront. Manzoli *et al.* [46] carried out a meta-analysis and found supporting evidence on the clinical equivalence of generics and argued for the approval of generics based on the existing regulatory systems. However, subsequent studies continued to show that technical proof of equivalence was not associated with increased confidence of practitioners nor acceptance of patients, particularly in developing nations.

Between 2019 and 2021, the scope of thematic further extended to cover the involvement of the WHO and drug

pricing in the context of international discussions on increasing access to cheap medicines. Studies such as [47] found that in the case of India, the general population knew much less than what they ought to know about schemes such as PMBJP, which were detrimental for the increased use of generics. Regulatory gaps and fragmented policy approaches continued to be the primary obstacles to progress [29,46].

The latest period of 2022 to 2024 has seen a further shift to advanced technical issues such as drug formulation, methods of production, and the socio-economic category of the aged. Frisk *et al.* [51] have pointed out that improved formulation processes relate directly to the issues of patient safety and efficacy, which adds to the formulation of policy on medicines. Tyagi *et al.* [47] brought to attention that aged patients still have considerable mistrust towards generics, which suggests further research is needed in India on population-tailored issues.

As a whole, the socio-political evolution has progressed from research purely about a product to investigations about regulatory bio-equivalence and other systemic issues. However, a significant amount of research is still purely theoretical with little actionable knowledge that could resolve provider, patient, and policy issues in India.

4.7. Clustering by coupling

The clustering by coupling analysis of the topic “Generic Medicine” presented in Figure 8 depicts thematic subdivisions by impact and centrality of the research. In this case, “impact” is the scholarly impact a study has, as quantified by the number of citations, while “centrality” is the interconnectedness of a theme in the web of research, thus, its relationship with other important topics. The themes “generic drug,” “human,” and “female” within the upper right quadrant, characterised by high impact and centrality, attest to the dominance of patient-centred research in synthesising academic discourse, particularly research examining the population’s attitude toward generic drugs and the role of gender. For example, [48,49] studied public attitudes toward generics and developed scales to measure them, including the attitudes and gender associated with the patient perspective, particularly

socio-behavioural constructs on the acceptance of generics, particularly in the Indian context that is characterised by limited public spending on healthcare [4–8] and poor public confidence in generics [16,31]. In addition, the thematic progression (Fig. 7) exhibits a movement from debates that are product-centric to those on systems, with little studies conducting empirical work around these derived conjectures.

Consequently, it is crucial that policy recommendations reflect these behavioural findings, supporting context-sensitive interventions such as targeted education [12,16]; direct substitution frameworks [23,41]; and provider engagement [41,42], instead of depending only on monetary motivation or regulatory control.

5. FACTORS AFFECTING PATIENTS' DECISION TO TAKE GENERIC MEDICATIONS

The choice of generic medication is not always favoured by customers, despite many attempts to promote generic medicines with the backing of government corporations [47]. Patient choice is crucial for better decision-making and enhanced service delivery outcomes [3]. Additionally, the patient empowerment paradigm has to be incorporated into any health marketing strategy that seeks to improve quality of life and general health behaviour changes [3].

There are several barriers to the marketing of generic medications and patients' acceptance of these medicines depends on several factors [9,53,54]. Some of the factors that affect a patient's or caregivers' decision to use generic or branded medications include the type of medical or disease condition with its severity, professional recommendations, cost differences (i.e., cost savings), previous knowledge with generic medications, and knowledge or information about generic medications [12].

5.1. Patients perception/awareness

This has much to do with the government's effort to assess patients' perceptions of generic versus branded medicines [13]. Although the WHO advises that basic medicines be widely available and reasonably priced for the general public, a study of the literature reveals that people's perceptions of generic medicines are unfavourable [13,54,55]. Research conducted out in Western nations where generic replacement is a common practice have revealed how people see generic medicines [31,55,56]. However, smaller sample sizes are included in the majority of Indian studies that describe how Indian patients view generic medicines [13,31,55–57].

The Indian government started the PMBJP program to educate patients about generic medicines [47]. Additionally, studies conducted globally and in India on patients' comprehension of using generic medicines have shown a variety of results. Several studies revealed that patients' understanding of generic medicines ranged from low to good, or 25%–92% [9,13,55–57]. Research based out of Houston, Texas, revealed favourable attitudes toward substituting branded medications with generics, with significant correlation ($r = 0.63$, $p = 0.001$) between attitudes toward generics and acceptance of substitution. Nonetheless, the sample involved only urban tertiary care patients, which poses methodological

and broader contextualization, particularly in the case of India. More studies in diverse settings are needed to establish these conclusions [12]. Therefore, patients need to have correct knowledge and information, which can make appropriate views regarding generic medications to increase the usage and acceptability of these medicines [9,51,58]. Additionally, a study revealed that opinions on whether generic medicines were riskier than branded ones varied widely, with responses ranging from 14.2% for cough to 53.8% for cardiac problems [12].

5.2. Patients' misconceptions

Misconceptions and negative perceptions may pose a significant obstacle to patients' acceptance and use of generic medicines [51,58,59]. The Food and Drugs Administration has identified some common misconceptions about generic medicines, such as the assertions that they are less effective, of lower quality, less safe, and have delayed benefits [9]. Reports state that a sizable proportion of consumers with unfavourable attitudes and false beliefs about generic medicines varies by nation [12]. Additionally, studies concentrating on certain populations (e.g., those with renal disease, epilepsy, or psychosis) demonstrated an increased resistance or unfavourable impression to the use of generic medicines [12]. For instance, patients suffering from epilepsy have mostly preferred generic medicine over branded medicine. In a pilot study conducted in the US, 70% of patients expressed their concern regarding generic medicine, and 87% of patients would be willing to replace generic medicine with branded medicine only if approved by their healthcare practitioner [58]. A Sweden-based national survey showed that 46% of epilepsy patients opposed substitution, with 71% of those participants fearing negative outcomes [12]. These results indicate that within sensitive healthcare settings, unconstructive views stem from a perception of danger and unfavourable clinical outcomes. While a significant percentage of participants (61%) supported the view that they could replace a branded medicine with a generic, 20% of respondents reported that it prevented them from accessing optimal medications, and 22% stated that it restricted them from receiving prescription drugs from their healthcare providers [12].

5.3. Cost advantage

The financial advantages of generic medicines are a proven and indisputable fact [13]. A study found that patients' perception towards the risk of the medical condition increased with the cost savings linked to switching to a generic medication [12]. Furthermore, it should be noted that generic medicines are widely available and may be used to treat a wide range of medical ailments, giving patients the chance to significantly reduce the cost of their healthcare budget [47]. Additionally, studies show that generic medicines are often less costly than branded ones, thus the usage of more generic drugs would cut the expenses of medical treatment without compromising the medications' quality [9]. Almost 13,000, trustworthy generic medicines are available in the market for patients at incredibly low prices [47]. Since generic medicines are widely available and reasonably priced, they are essential to the lives of the

majority of Indians [60]. Also, a study's results showed that 67% of patients trusted that generic medicines to be less in cost than name-brand drugs [13]. Similar results were obtained from a national study of patients with commercial insurance carried out in the United States, which revealed that 94% of participants thought generic medicines to be less costly than name-brand counterparts [61].

5.4. Efficacy

The government has made efforts to support generic medicines, yet there is still a great deal of debate over their efficacy [31]. There are contradictory findings on the effectiveness of generic medicines. Since not everyone has trust in generic formulations, the public's encouragement to take generic medicine depends on the efficacy of the generic formulations. A study found that generic medicines are equally efficacious as branded ones and do not lack any quality in comparison to branded drugs [48]. Studies examining patients' perceptions of the effectiveness of generic medicines have shown a range of results, from 42.25% to 93%, suggesting that generics were just as effective as branded ones [31,55,56]. Additionally, a meta-analysis of small randomized studies on cardiovascular drugs revealed no differences in soft or hard clinical outcomes between branded and generic medicines [46]. However, a study found that many consumers also believed generic medicines were not "genuine," and those who took them thought they were less effective than branded ones [13]. A nationwide survey of 5,000 Brazilians found that 30.4% of participants believed branded drugs to be more efficacious than generic ones [13]. Additionally, a systematic analysis found that, among lay people, generic medications were thought of as being lower quality by 25.1% (95% CI, 24.2%–26.0%) and as being less effective than branded medicines by 35.6% (95% CI, 34.8%–36.4%) [21].

5.5. Safety/side effects profile

To encourage the public to utilize generic medicines, the results of studies on the safety and adverse effects of these medicines are also essential. A study revealed that, when it came to the safety and adverse effect profiles of these drugs, 61% of patients believed that switching to generic versions would not increase side effects [12]. Additionally, 85% of patients in another study did not believe that switching to generic medicines was harmful [62]. 30% and 56% of patients believed branded and generic medicines to be similarly safe [48,49]. However, it has been observed that when consumers of branded medicines convert to generic ones, they often experience very minor variations [63].

Some of the studies reported that there were no discernible variation adverse drug reactions between consumers of name-brand and generic medications. Additionally, individuals in a different study who used both branded and generic medicines reported side effects ranging from 10% to 15%, with no noticeable difference [31]. However, contrary to the prevailing consensus, more than 80% of respondents in a Maharashtra (India) survey believed that consuming generic drugs are often lesser in safety than their name-brand

equivalents [64]. In rare cases, a patient may experience side effects from a generic medicine due to inactive ingredients such as fillers, coatings, preservatives, colours, and flavours [47].

5.6. Generic medications' quality

Patients' decisions to utilize generic medications are significantly influenced by their perceptions of the quality of these drugs. Studies reveal that 20% of patients believed that switching to generic medication treatment led to drugs with low in quality in terms of the generics' quality profile [12]. Furthermore, in another study, almost one-third of the participants (mainly patients over 60, with a chronic illness, and/or without a college degree) thought that the comparatively low-priced generic medicines were either completely different from name-branded drugs or low in quality [31]. To ensure the quality of the drugs that would be supplied, PMBJP, however, acquires medicines from the Food Safety Standards Authority of India (FSSAI), WHO-GMP, and other authorized suppliers in India for all Indian people [47].

5.7. Disease types

Several chronic and acute conditions may require the use of generic medications as part of standard therapy [12]. The decision between utilizing a brand-name drug and a generic medicine was found to be significantly influenced by the kind and severity of the medical condition. Research has demonstrated that perceptions of patients vary towards the risk depending on the type of medical illness [12]. Further, there is a common belief that generic medicines are not "genuine" and should only be used for minor illnesses [31]. The outcomes of a study revealed that, regardless of cost or savings, a greater proportion of participants (27.2%) would not take generic medicines for cardiac problems, compared to just 2.6% for a cough [31].

These findings were also supported by data from another study on the effectiveness of generic medicines for angina, asthma, and influenza. The type of illness had a significant impact on how much people agreed to use generic medications. The perception of sickness severity had a substantial impact on the uptake of generic medications [12]. Additionally, studies about people suffering from renal disease, psychosis, or epilepsy reported a greater resistance due to a negative attitude about utilizing generic medicines [50,65–67].

5.8. Trust on generic medicine

Meanwhile, the role of trust in the pharmaceutical sector is also very important. Clear communication, constant quality, positive health results, and effective outcomes are important to earn and retain trust. India's generic market is an interesting example whereby value generic brands charge much lower prices, whereas top tier brands are much more expensive, and inexplicably enjoy far greater trust, which is illustrated in a study [68]. Further investigation demonstrated that many individuals were confused mistrusted and mistrusted about generic medicines [12]. But it is also important to remember that 90% of people who moved from branded to generic medicines were satisfied with their decision,

demonstrating how generics are starting to establish confidence in our community.

5.9. Accessibility of generic medicine

The lack of high-quality generic formulations on the market seems to be a significant obstacle to the broader acceptance of generics in prescription and dispensing practices [31]. According to the Ministry of Health and Family Welfare, the “mandatory generic drug use” policy has been in effect in hospitals funded by the government since 2012 [13]. Therefore, in the initial stages in India, the usage of generic medications has typically been limited to government hospitals [13]. Moreover, generic medicines were scarce in the Indian market and were restricted to government, private, and medical dispensary hospitals. The PMBJP was introduced by the Indian government in 2015 to make high-quality, non-branded medicines accessible and affordable for everyone, particularly the impoverished and disadvantaged. This was accomplished through the establishment of exclusive retail stores known as “Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP),” having pharmacies that sell mostly medicines with generic molecule names to patients to minimize their out-of-pocket expenses [69]. Additionally, the study demonstrated that both the generic and brand groups had similar access to and storage for medications [31].

5.10. Collaboration of patients, physicians, pharmacists

The idea that physicians and pharmacists collaborate to promote generic medications and assist patients in accepting their usage and substitution is well supported by the research [12]. Furthermore, research indicates that using generic medicines is negatively correlated with insufficient patient-physician communication [9,59,70]. Studies have shown that when physicians counsel, advise, and advocate for their patients about the equivalent efficacy and lower cost of generics, patients’ awareness, comprehension, and acceptability of generics may increase [9]. Another study found that 64.5% and 88.7% of patients, respectively, were prepared to take generic replacements on the recommendation of their medical doctors and pharmacists [12]. Additionally, studies show that 82.4% and 86.2% of patients indicated that they trusted their physicians and pharmacists, respectively, to choose the right product [12]. A significant positive correlation ($r = 0.40$, $p = 0.001$) was found between the participants’ opinions about generic replacement and their willingness to ask their pharmacists to provide one [12]. Further investigation, however, showed that physicians seldom ever prescribe generic medications due to grave worries about the effectiveness and safety of these therapies. Furthermore, a survey revealed that just 13%–18.19% of patients had taken generic medicines in the preceding six months. One possible explanation for the low level of generic usage is that fewer doctors are prescribing them [55]. Further investigation showed that around 81.0% of patients denied receiving advice or suggestions from a physician or pharmacist to switch from name-brand to generic medicine [12,13,21,55]. Consequently, improving primary care physicians’ opinions of generics will surely result in more of them being prescribed and used [71].

5.11. Patients’ knowledge

It is suggested that patients should also get knowledge regarding generic medicines via the educational and media programs because any fears they may have might lead them to decline the use of a generic substitute, confuse them, or make it difficult for them to take their prescription as prescribed [12]. Research indicates that the major sources of information on generic medicines were doctors (55.6%), pharmacists (50.4%), public campaigns (27.3%), health magazines (16.1%), and the Internet (14.6%) [12].

5.12. Miscellaneous factors

We also studied the effect of other demographic factors on the patient’s choice to use generic medications. A study found that participants’ demographics and degree of concurrence with utilizing generic medications to treat ailments such as angina pectoris, hypertension, influenza, and asthma did not differ significantly [48]. In addition, no statistically significant relationship was observed between beliefs about generic medicines and gender. However, the limited sample size and urban tertiary care setting may limit the generalisability of this finding. The need for further research across the Indian context is underscored by methodological issues such as possible sample bias and poorly-defined diversity thresholds, particularly in the Indian context [12].

Conversely, the study found that older participants (mean score 3.13 ± 0.61 for 24 years old, 3.29 ± 0.63 for 25–44 years old, and 3.39 ± 0.59 for 45–64 years old; $p = 0.002$) were more likely than younger participants to think that a generic product was comparable to the name brand [12]. Additionally, participants with greater levels of qualification were also more likely to think that generic medicines work (mean score 3.57 ± 0.69 for nine years of education, 3.80 ± 0.57 for 12 years of education, and 3.92 ± 0.54 for graduates; $p = 0.001$) [49]. Furthermore, studies have shown that patients’ decisions were also reportedly influenced, albeit to a lower extent, by the product’s manufacturer (10%), splittability (24%), excipients (16%), place of origin (25%), and brand name (8%). Moreover, the study’s participants placed little weight on other features such as form, colour, or pack design [12].

6. IMPLICATIONS FOR PRACTICE, POLICY, AND FUTURE RESEARCH

To ensure patients view generic medicines positively and use them appropriately, patients must understand the safety, effectiveness, and quality of these alternatives. Various studies have focused on the implications for low acceptance and therapeutic non-adherence when patients have limited information, or, as one recent work notes, when patients hold firm beliefs that low-cost medicines mean low quality [9,12,13,47]. Awareness campaign on generic medicine directed at the public are thus critical to address and remedy the misperceptions and underscore the science of bioequivalence, which certifies generics are interchangeable with branded drugs in dosage forms, active ingredients, safety, and therapeutic outcomes [13,27,47].

The most prominent position in the healthcare setup that directly affects patients' choices are healthcare providers, and in particular, physicians and pharmacists. Their support of generics during referrals and prescriptions has a marked impact on patients' choices [9,12,55]. Without question, initiatives to enhance the acceptance of generics must feature provider-oriented approaches, such as training in continuing education, evidence-based substitution frameworks, and responsive communication to address patients' fears and objections.

Studies, as with the example under PMBJP, show promise in affordable access, particularly with the underpopulated segments and the underprivileged [12,67]. Nevertheless, expansion in these initiatives will require proactive adjustments in the policy space around access to regulated and quality medicine, distribution in rural peripheries, and awareness among the providers and the population in demand. Improved and better integrated infrastructures of Jan Aushadhi Kendra with local health systems may increase incentives to the consumption of generics.

Compulsory generic substitutions have not been productive, as the evidence in this review indicate the need to properly evaluate their contextual application. Moreover, other than the multipliers of demand to suggest substitutions, the demand should increase through other motivators such as inclusion in the formulary, the insurance coverage to structured, and the explicit promotion of the generics to the healthcare providers [12,31,41].

The generics research space lacks focus on demographics and region in the perceptions of generic medicine. Research on acceptance of generic medicine provides a good starting point, but the analysis would require a comparative lens cross culturally to understand systemic and moral factors [15,54]. A long-term study on the generics in chronic conditions of cardiovascular diseases, diabetes, and cancer on the efficacy and safety will restore the confidence of the clinical health providers and the patients [27,31].

Confidence in a healthcare system and a pharmaceutical brand is an important factor in the acceptance of generic medicine. Even though generics and branded drugs are clinically the same, patients tend to prefer branded drugs because of the trustworthiness perception [66]. Generics potentially gaining trust because of endorsements from key opinion leaders, trust and regulatory oversight communication, and quality assurance seals should be explored in future work.

As a last point, the impact of public health campaigns designed to spread awareness of prescribing generics should include the willingness of patients to switch to a branded drug and focus on prescription behaviour. Understanding these relationships will help design responsive, evidence-based programmes for the local health system.

7. CONCLUSION

The SLR and bibliometric analysis presented in this study provide a comprehensive assessment of the evolution of research on generic medicines from 1973 to 2024, with a specific focus on patient acceptance in India. The unique element of this research is the identification and organisation of themes and trends such as the cost of the medicine,

bioequivalence, patents, promotion of the medicine, patients' attitudes, legal aspects, and the cognitive dissonance of patients alongside the educational policies. This research shows that despite the considerable academic interest, generic medicine is still shunned due to several misconceptions, safety and efficacy concerns, poor perception, and low knowledge about government programmes like PMBJP, as well as poor regulation. This research is the only one that used bibliometric mapping to show that the most significant deficit in generic medicine research is the lack of patient-centred and demographic research, while the most advanced areas of study are gender and the private sector. It is also noteworthy that the persistent concerns about bioequivalence and the cost of a medicine are in harmony with the growing international interest in the use of generics as a means of containing overall healthcare expenditure. Available evidence shows that this is the first research to address the connection between these technical and policy areas with the behaviours of patients and practitioners in India. This paper enriches the field as it meticulously tracks the development of research themes and maps the trends across time. The insights emphasise the need for tailored educational strategies to correct misconceptions and increase knowledge on the topic, as well as the responsibility to develop policies on the regulatory side and further incorporate generics into the national healthcare systems to increase affordability and access. Although generic medicines are scientifically equivalent to branded medicines, patient acceptance is still low by their concerns about safety, efficacy, and quality. In India, the market for pharmaceutical generics has been growing steadily, driven by government initiatives to improve accessible healthcare. The Pradhan Mantri Bharatiya Janaushadhi Pariyojana (PMBJP) promotes the use of generics by making Jan Aushadhi Kendras more accessible across the nation. These initiatives improved access to generics, as well as the generics awareness of the general public. However, even these initiatives and programs are unable to influence the sale of brand-name prescriptive medication. This points to a larger issue where the healthcare system lacks education on the benefits of using generics, the quality of generics available on the market, and uses the slow adoption of policies intended to promote generic prescribing. To further strengthen acceptance and usage of generics, future research should:

- Measure the impact of generics on out-of-pocket spending in diverse populations, especially rural and low-income groups, quantifying potential savings.
- Assess the long-term clinical outcomes of generic vs branded medicines in chronic disease settings (cardiovascular, diabetes, cancer) within Indian cohorts.
- Evaluate public information campaigns (e.g., through Jan Aushadhi) not only by awareness metrics but by changes in prescription behaviour and market share changes. With such evidence, India has the potential to save substantial amounts on healthcare costs, improve equity in medicine access, and provide models for other lower- and middle-income countries. With such evidence, India has the potential to save substantial amounts on healthcare costs, improve equity in medicine access, and provide models for other lower- and middle-income countries.

8. AUTHOR CONTRIBUTIONS

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval of the version to be published; and agree to be accountable for all aspects of the work. All the authors are eligible to be author as per the International Committee of Medical Journal Editors (ICMJE) requirements/guidelines.

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The authors report no financial or any other conflicts of interest in this work.

11. ETHICAL APPROVALS

This study does not involve experiments on animals or human subjects.

12. DATA AVAILABILITY

The data supporting the results of this research are accessible in standard research databases such as PubMed, Scopus, ScienceDirect, Google Scholar, The Cochrane Library, Web of Science, and/or public domains that are accessible via keywords or DOI numbers.

13. PUBLISHER'S NOTE

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The authors declare that they have not used artificial intelligence (AI)-tools for writing and editing of the manuscript, and no images were manipulated using AI.

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The corresponding author is the Guarantor of Submission.

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