

Clinical research for low back pain in Turkiye: analysis of pubmed-indexed randomized controlled trials

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ABSTRACT

Aims: Low back pain (LBP) is a prevalent condition and a major contributor to disability worldwide. Despite bibliometric analyses of LBP literature, no study has specifically explored Turkiye's contribution to this field through randomized controlled trials (RCTs). This study aims to examine the characteristics of Turkiye-based RCTs on LBP, utilizing PubMed, the most frequently used biomedical search engine.

Methods: A comprehensive search was conducted on PubMed using the terms "low back pain [Title]" and "(Turkiye) OR (Turkiye)." Only interventional RCTs were included. Data points such as publication year, open-access status, first author's specialty, study content, journal quartile (Web of Science), and citation count (Google Scholar) were analyzed.

Results: Most publications are authored by Physical Medicine and Rehabilitation (PMR) specialists (26) and physiotherapists (24), with emergency medicine specialists (6) in third place. The number of publications increased over time, peaking in 2021 (10). Most publications appeared in Q1-Q2-Q3 journals (67). The average citation count is 46.9, median is 29, ranging from 0 to 305, with citation counts strongly influenced by publication year ($p < 0.001$). The most common research topics are Complementary and Alternative Medicine (CAM) (15), Physical Therapy Agents (14), and Injections (10). PMR specialists have more citations than other groups ($p = 0.001$). Open access status did not significantly affect citation counts ($p = 0.277$).

Conclusion: Turkiye-based RCTs on low back pain have steadily increased, with PMR specialists and physiotherapists leading the field. Publications are primarily found in high-impact journals. Key research topics include CAM, physical therapy agents, and injections.

Keywords: Low back pain, randomized controlled trial, Turkiye, bibliometric analysis, PubMed

INTRODUCTION

Low back pain (LBP) is one of the most prevalent musculoskeletal disorders, affecting a substantial portion of the global population.¹ Most individuals experience at least one episode of acute low back pain during their lifetime, and although the condition often resolves on its own, it frequently develops into a chronic issue for many.² Research indicates that over 60% of individuals with mechanical low back pain continue to suffer from pain or experience recurrences within a year of the initial onset.³ Furthermore, low back pain is recognized as a leading cause of global productivity loss and is the primary cause of years lived with disability in numerous countries.⁴ Prevalence estimates indicate that LBP affects around 11.9% of the population at any given time, with a one-month prevalence of 23.3%, particularly in middle-aged and older women.⁵ These figures emphasize the substantial personal and societal burden associated with this condition.

PubMed, a widely used database for biomedical literature, plays a crucial role in disseminating research findings. It

provides access to citations and abstracts from over 5000 life science journals, with coverage extending back to 1948. Serving as an indispensable tool for researchers and clinicians worldwide, PubMed enables millions of searches daily, allowing users to stay updated on the latest scientific developments and contribute to new discoveries.^{6,7} Despite the extensive body of LBP literature indexed in PubMed, few studies have specifically addressed Turkiye's academic contribution to this field.

Although several bibliometric analyses have examined the global and national LBP research landscape, there has been limited focus on Turkiye's specific contributions.⁸⁻¹¹ This study seeks to fill this gap by analyzing the clinical research on low back pain in Turkiye, as indexed in PubMed, with a focus on randomized controlled trials (RCTs). The aim is to provide a comprehensive overview of Turkiye's research output, including details such as the publishing trends, journal impact, and citation performance of these studies.

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METHODS

This study did not involve human or animal subjects, as it is a bibliometric analysis of existing literature. Therefore, no formal ethical approval was required. However, the research was conducted in accordance with general ethical principles, ensuring research integrity and data confidentiality.

This bibliometric analysis focused on RCTs related to LBP indexed in PubMed and conducted by first authors affiliated with institutions in Türkiye. A systematic search of PubMed was performed using the advanced search query “low back pain [Title] AND “(Türkiye) OR (Türkiye),” with a filter applied to include only clinical trials. Only interventional randomized controlled clinical trials were included in the analysis. Non-RCT publications such as letters to the editor, case reports, narrative reviews, and observational studies were excluded from the analysis. Data collected included the year of publication, open-access status, the first author’s medical specialty, the study’s primary research question, the journal’s quartile ranking according to Web of Science, and the citation count from Google Scholar. For some journals, quartile rankings were unavailable in Web of Science.

The studies were grouped based on their primary research question into the following categories: exercise, oral-IV-IM medications, injections, Complementary and Alternative Medicine (CAM), physical therapy agents, balneotherapy, kinesiotaping, patient education, telerehabilitation, and virtual reality. Different massage techniques, manual therapy techniques, vagal stimulation, diet, neural therapy, and mesotherapy techniques were categorized under CAM. Studies primarily focusing on prevalence, risk factors, pain-related factors, disease duration or severity, painkiller usage, and pain assessment methods were outside the scope of this analysis and were not included. Our focus was limited to interventional RCTs addressing treatment approaches.

Some studies were counted in multiple groups due to overlapping content. For example, mesotherapy (1 study) and neural therapy (1 study) studies were included in the “CAM” and also in the “Injections” group. ESWT (1 study) was categorized under physical therapy agents.

Most studies recommended exercise programs for both the intervention and control groups as part of standard care. Studies where the primary focus was to compare exercise methods or specifically evaluate the effectiveness of exercise were categorized separately under the “Exercise” group. Studies that used exercise as part of a standard treatment in both groups were also recorded.

Since the majority of publications were authored by physiatrists and physiotherapists, some comparisons were conducted based on three groups for statistical reasons: physiatrists, physiotherapists, and others (this group includes various medical specialties as well as a small number of nurses and occupational therapists).

Statistical Analysis

It was performed using SPSS (Statistical Package for the Social Sciences) Version 21.0 (IBM Corp., Armonk, NY), with statistical significance defined as $p \leq 0.05$. Descriptive statistics

(mean, standard deviation, median, and range) were used to summarize the data. Non-parametric tests were applied due to the nature of the data distribution. The Kruskal-Wallis test was used to compare citation counts and publication ages among the three groups of authors (physiatrists, physiotherapists, and others). Post-hoc analysis was conducted using the Mann-Whitney U-test where appropriate. Spearman’s rank correlation test was applied to assess the relationship between publication year and citation count.

RESULTS

There are 72 unique publications in total, spanning from 2003 to 2024. These publications show a gradual increase over the years, peaking in 2021 with 10 publications (Figure 1). The majority of publications are authored by Physical Medicine and Rehabilitation (PMR) specialists (26), followed by physiotherapists (24), and emergency medicine specialists (6) (Figure 2). Physiatrists and physiotherapists had more publications than other groups, but there was no significant difference between these two groups.

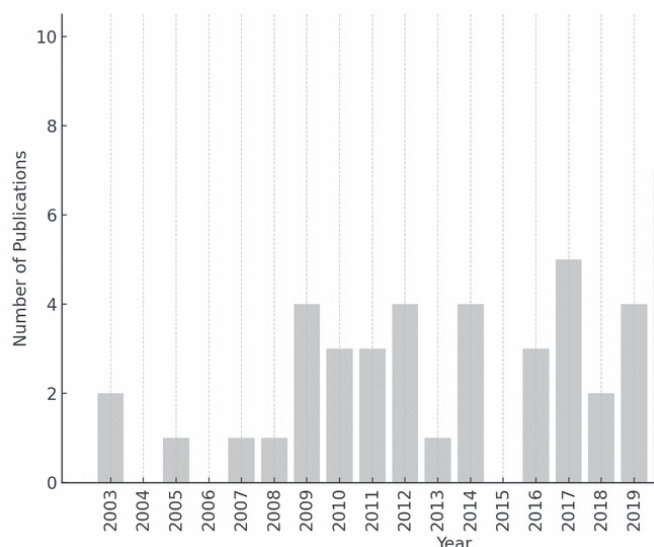


Figure 1. Number of publications by year

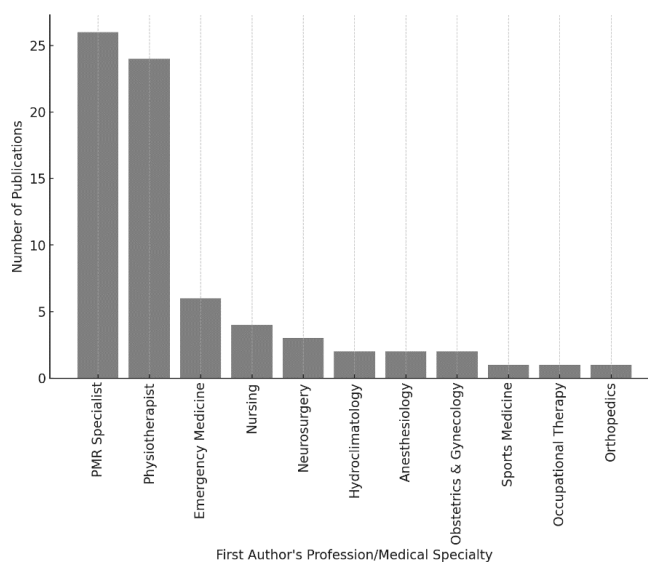


Figure 2. Distribution of publications by first author’s profession/medical specialty

Out of the six studies conducted by emergency medicine specialists, five focused on acute low back pain, while one study included both acute and chronic low back pain patients. Among the other studies analyzed, only six involved patients with acute low back pain. In one of these six studies, both acute and chronic low back pain patients were included.

The majority of the publications appeared in Q1-Q2-Q3 journals (67 publications). Only a few (5) were published in Q4 or non-classified journals (Figure 3).

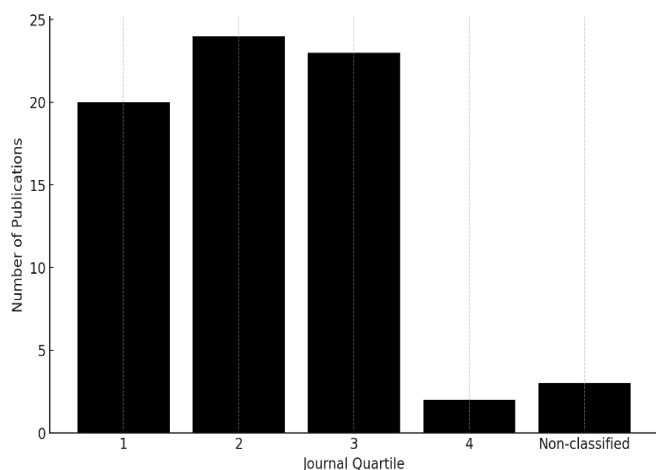


Figure 3. Distribution of publications by journal quartile

The most common research topics were Complementary and Alternative Medicine (15 publications), Physical Therapy Agents (14 publications), Injections (10 publications), Oral-IV-IM Medications (9 publications), and Exercise (8 publications). 36 studies included exercise as a treatment modality, while 36 did not. Among the studies that included exercise, 8 focused exclusively on exercise interventions, while the other 8 incorporated an exercise program alongside the primary treatment being studied (Figure 4).

The average citation count across all publications is 46.9, with a median of 29, ranging from 0 to 305 citations. A Spearman correlation test showed a strong negative correlation between citation count and publication year ($p < 0.001$), indicating that older publications tend to have more citations.

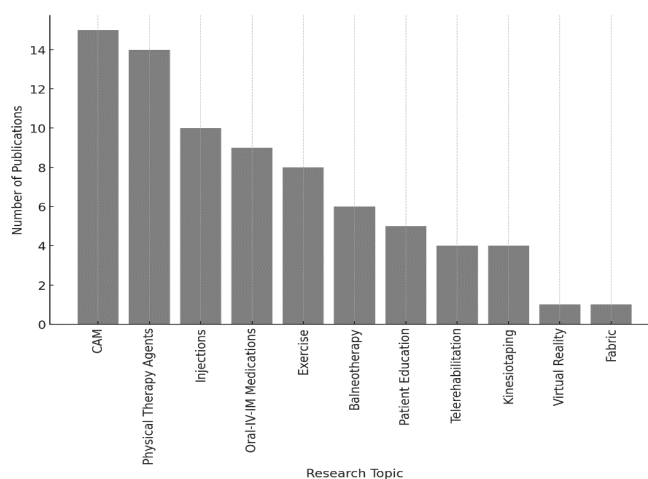


Figure 4. Distribution of publications by research topic

Dividing the publications into three groups (PMR specialists, physiotherapists, and others) and analyzing citation counts using the Kruskal-Wallis test revealed significant differences ($p = 0.002$). Post-hoc analysis showed that PMR specialists had significantly higher citation counts than both physiotherapists ($p = 0.002$) and the other groups ($p = 0.046$), while there was no significant difference between physiotherapists and the other groups ($p = 0.726$) (Table 1).

The analysis of publication years among the three groups (PMR specialists, physiotherapists, and others) also revealed a statistically significant difference in publication age ($p < 0.001$). PMR specialists had the oldest publications, with a significantly higher publication age than both physiotherapists ($p < 0.001$) and the other groups ($p = 0.008$). There was no significant difference between physiotherapists and the other groups ($p = 0.403$) (Table 1).

The 10 most cited studies cover topics such as physical therapy agents, exercise, patient education, and injections, with citation counts ranging from 139 to 305.

Out of the 72 publications, 11 are open access, and 61 are not. The Mann-Whitney U test revealed no statistically significant difference in citation counts between open access and non-open access publications ($p = 0.277$).

Table 1. Citation analysis and years since publication by groups

	Median (min-max)	Mean±SD	p	Post-hoc
Number of citations				
Total	29 (0-305)	46.9 ± 55.0	0.002	0.002(a-b)
Physiatristsa	44 (1-305)	75.6 ± 70.2		
Physiotherapistsb	16 (0-117)	25.7 ± 29.9		
Othersc	18.5 (0-136)	36.2 ± 41.6		0.046(a-c)
Publication age (2024-publication year)				
Total	5 (0-21)	6.9 ± 5.6	<0.001	<0.001 (a-b)
Physiatristsa	11 (2-21)	10.6 ± 5.9		
Physiotherapistsb	2.5 (0-14)	3.3 ± 3.4		
Othersc	5.5 (0-15)	6.6 ± 4.4		

SD: Standard deviation

DISCUSSION

The analysis of RCTs related to LBP in Türkiye reveals several key insights. First, there has been a steady increase in the number of RCTs over the years, with a notable peak in 2021. Physiatrists and physiotherapists were the primary contributors to these studies. The most common research topics included CAM, physical therapy agents, and injections. Older publications had higher citation counts, open-access status did not significantly impact citation performance.

In line with the conclusions from previous bibliometric studies, our analysis shows a clear upward trend in the number of RCTs on LBP in Türkiye over the years.^{8,9,12} Similar to Weng et al.'s⁹ analysis, which identified a consistent annual growth in nonspecific LBP publications from 2000 to 2018, and Huang et al.'s¹² findings that LBP research has gained increasing global attention in the last two decades, our study demonstrates a rising interest in LBP research in Türkiye, peaking in 2021. However, despite this growth, Türkiye has not yet emerged as one of the top countries contributing to LBP-related academic literature, a point that underscores the need for further enhancement of research output and global visibility. Moreover, unlike previous studies, which often did not provide detailed breakdowns by study types, our analysis offers a focused examination of RCTs, providing a unique contribution.

Additionally, as highlighted by Šajnović et al.,⁸ thematic analyses of chronic LBP research have identified six primary themes, including complementary methods in physiotherapy. This finding parallels the results of our study, where CAM emerged as a significant research focus in Türkiye's LBP-related RCTs. The attention given to CAM in the Turkish literature reflects the broader global interest in exploring non-conventional therapies for managing LBP. Our analysis shows that CAM-related trials were among the most frequently studied topics, further underscoring the relevance of this approach within both Turkish and international LBP research.¹³

Considering the publication numbers in 2019, 2020, and 2021, it appears that the COVID-19 pandemic did not negatively affect RCTs related to low back pain in Türkiye. Research activity in this field continued to grow, indicating that clinical trials persisted despite the challenges posed by the pandemic.

The dominance of physiatrists in terms of citation counts could be attributed to their longer history of academic involvement in Türkiye.^{14,15} PMR is an established and longstanding specialty in the country, which may explain why these professionals receive higher citation counts, as they have had more time and experience to contribute to the scientific literature.

The fact that open access status does not significantly affect citation counts may be due to the availability of certain restricted-access publications through alternative platforms. Researchers may still access non-open access articles via academic networks or institutional libraries, which might explain why open access does not have a marked influence on citation performance in this context.

Limitations

One limitation of this study is that the search was restricted to publications indexed in PubMed, which may have excluded relevant studies available in other databases. However, it is important to note that numerous studies have similarly evaluated the contributions of different specialties at a national level using PubMed as the sole database.^{16,17} A second limitation is that only studies with the term "low back pain" in the title were included, potentially omitting studies related to the topic but not explicitly mentioning it in the title. Future research involving more databases and including studies focused on specific diagnoses and causes of low back pain could validate, expand, and provide different perspectives on the preliminary findings of this study.

CONCLUSION

This bibliometric analysis highlights the steady growth of Türkiye-based RCTs on low back pain, particularly led by PMR specialists and physiotherapists. The increasing number of publications, especially in high-impact journals, reflects the country's growing academic contribution to this field. Key research areas, including CAM, physical therapy agents, and injections, align with global trends in LBP research. While citation counts are strongly influenced by the publication year, open access status does not appear to impact citation performance significantly. Future research should expand to include a broader range of databases and study types to offer a more comprehensive understanding of Türkiye's role in the global LBP research landscape.

ETHICAL DECLARATIONS

Ethics Committee Approval

This study did not involve human or animal subjects, as it is a bibliometric analysis of existing literature. Therefore, no formal ethical approval was required. However, the research was conducted in accordance with general ethical principles, ensuring research integrity and data confidentiality.

Informed Consent

This study did not involve human or animal subjects, as it is a bibliometric analysis of existing literature. Therefore, no informed consent was required.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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