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Research Trends in Basketball Injuries: A Systematic Review of Peer-Reviewed Literature

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Abstract
This systematic review examines contemporary research trends in basketball injuries through 41 peer-reviewed studies published between 2021 and 2024. Using Web of Science, the review identified a dominant focus on ***orthopaedics (12 studies)*** *and* ***rehabilitation (10 studies)****, reflecting sustained clinical emphasis on injury management and functional recovery. Publication trends peaked in 2021 (12 studies), declined slightly in 2022 (9 studies), and stabilized in 2023–2024 (10 studies each), likely influenced by pandemic-related disruptions. Notable gaps were observed in interdisciplinary domains, particularly* ***public health, biochemistry, and psychology****, each of which was minimally represented (≤2 studies). The findings highlight opportunities for cross-disciplinary collaboration to address fragmented knowledge and enhance holistic injury prevention strategies. Future research should prioritize integrating perspectives from physiology, sports psychology, and public health to optimize athlete well-being across competitive levels.*

INTRODUCTION

Basketball has established itself as one of the most popular sports in the United States and throughout the world, attracting both male and female athletes across a wide spectrum of ages and competitive levels (Newman & Newberg, 2010; Wen, Dalbo, Burgos, Pyne, & Scanlan, 2018). The global growth of basketball, highlighted by the success and expansion of the National Basketball Association (NBA) and the Women's National Basketball Association (WNBA), has enhanced the sport's visibility, encouraging widespread participation and a growing focus on the health and safety of its athletes (Newman & Newberg, 2010; Deitch, Starkey, Walters, & Moseley, 2006; Karipidis, Fotinakis, Taxildaris, & Fatouros, 2001). Central to this attention is a heightened awareness of the patterns, mechanisms, and prevention strategies associated with basketball injuries. Basketball is unique among major team sports in that it features competitive men's and women's leagues at both the collegiate and professional levels (Newman & Newberg, 2010). This inclusivity, along with the physically demanding nature of the sport, has driven researchers, clinicians, and coaches to investigate the physiological demands of basketball and the specific risk factors that predispose athletes to injury (Wen et al., 2018; Edwards et al., 2018). Physiological assessments have revealed that competitive basketball requires significant aerobic and anaerobic output during games, with players demonstrating high levels of oxygen consumption (VO2) and blood lactate concentrations during play. Male and female players have slightly different physiological profiles in terms of VO2 and lactate accumulation, emphasizing the need for tailored conditioning approaches (Wen et al., 2018). The physical demands of sprinting, jumping, and abrupt changes in direction are characteristic of basketball and contribute to both acute and cumulative fatigue throughout a lengthy season (Edwards et al., 2018). Injury patterns have been extensively studied in the NBA and WNBA, revealing lateral ankle sprains as the most frequent orthopaedic injury, with patellofemoral inflammation accounting for the most games missed (Newman & Newberg, 2010; Deitch et al., 2006). Other common injuries include lumbar strains, hamstring strains, and knee sprains, with foot, ankle, knee, back, and hand injuries occurring most often (Henry, Lareau, & Neigut, 1982). Intriguingly, player demographics—such as age, height, weight, and years of professional experience do not significantly affect injury rates (Newman & Newberg, 2010). Gender disparities in basketball injuries have also been documented. Female professional basketball players tend to experience a higher overall game-related injury rate and a greater frequency of lower extremity injuries compared to their male counterparts (Deitch et al., 2006). The lower extremity remains the most commonly injured body region in both men's and women's leagues, with

lateral ankle sprain consistently ranking as the most prevalent diagnosis (Deitch et al., 2006). Among recreational basketball players, observational studies have identified key risk factors for ankle injuries, including a prior history of ankle injury, wearing shoes with specific air cell structures, and failure to stretch before games (Newman & Newberg, 2010). Such findings underscore the importance of targeted preventive strategies and the need for evidence-based guidelines for injury reduction. Recent research has shifted towards the efficacy of isometric exercises and other conditioning protocols as methods of injury prevention. Isometric training, when tailored to individual athlete characteristics, has shown a measurable reduction in injury rates and improvement in physical fitness indices (Taylor, Ford, Nguyen, Terry, & Hegedus, 2015). Such interventions contribute not only to enhanced injury prevention but also to optimal athletic performance throughout the season.

The rising prevalence of online consumer communities for basketball shoes, a critical piece of equipment for injury prevention, has further influenced the innovation process. These online forums facilitate joint-development activities, enabling highly creative and motivated participants to collaboratively design new shoe models, thereby addressing common injury mechanisms and disseminating best practices among the basketball community (Füller, Jawecki, & Mühlbacher, 2007).

Despite advances in research and coaching practice, a conspicuous gap remains regarding sport-specific physical fitness tests and systematic monitoring of workload and fatigue in basketball (Mancha-Triguero, García-Rubio, Calleja-González, & Ibáñez, 2019; Edwards et al., 2018). The most frequently studied physical capacities include jump performance, aerobic capacity, and anaerobic capacity, but specific tests tailored to basketball are rarely employed (Mancha-Triguero et al., 2019).

METHODOLOGY

Table No. 1.0 Framework of the Systematic Review Process

Phase	Specifics
Database Used	Web of Science
Fields Searched	All fields (title, abstract, keywords, etc.)
Time Frame	2021 to 2024
Total Records Retrieved	751 studies
Inclusion Criteria	-Studies published between 2021 and 2024 -Peer-reviewed articles -Relevant to research focus
Exclusion Criteria	- Outside 2021-2024 - non-peer-reviewed articles, conference abstracts, proceedings - Irrelevant research
Selection Process	- Stage 1: Title and abstract screening of 751 results - Stage 2: Full-text review based on criteria - Final selected studies: 41
Data Extraction & Synthesis	Extracted key info (author, year, objectives, methods, findings); qualitative and/or quantitative synthesis
Quality Assessment	Performed quality appraisal using suitable checklists; only studies meeting minimum quality were included.

Findings

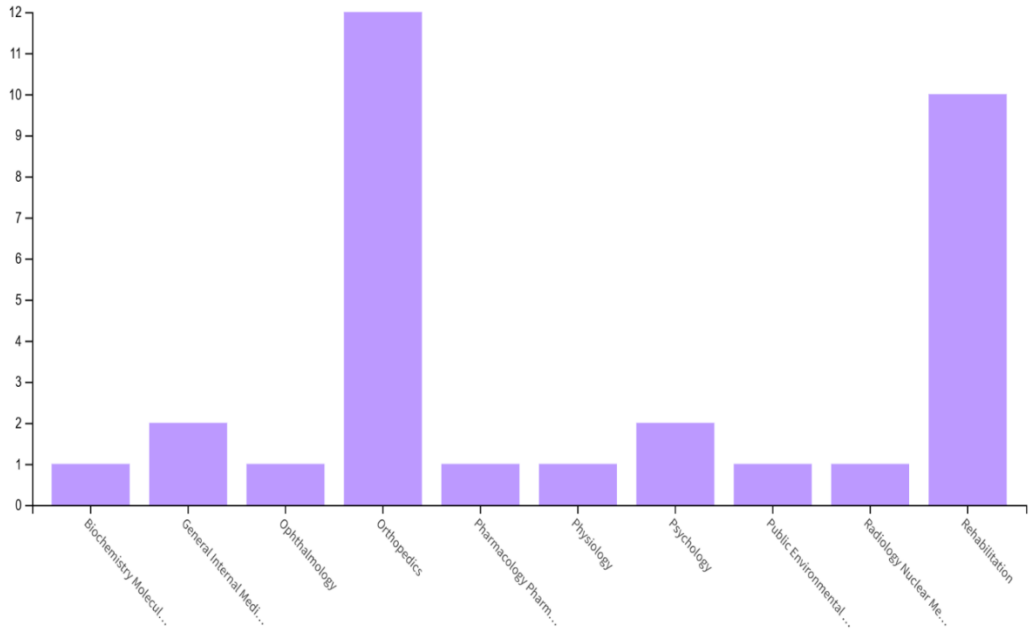

Figure No. 1.0 Distribution of Selected Studies Across Research Discipline

The bar chart illustrates the distribution of the 41 selected studies across various research disciplines from 2021 to 2024. Orthopaedics stands out as the most prominent field, with 12 studies, highlighting a significant research focus in this area. Rehabilitation also shows a strong presence, with 10 studies, indicating considerable attention to this discipline. General Internal Medicine and Psychology each have two studies, suggesting moderate research activity. Other fields such as Biochemistry, Ophthalmology, Pharmacology, Physiology, Public Environmental Health, and Radiology, Nuclear Medicine contribute one study each, reflecting more limited research representation. This distribution provides insight into the dominant and less explored areas within the reviewed literature, helping to identify where research efforts have been concentrated and where potential gaps might exist.

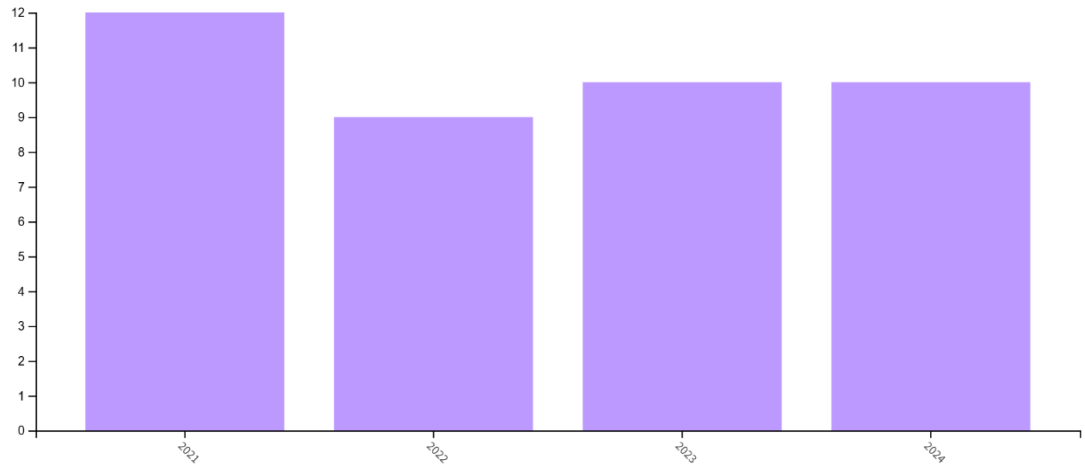

Figure 1.2 Distribution of articles over time

The bar chart shows the annual distribution of the 41 selected studies published between 2021 and 2024. The data reflect how research output varied over these four years within the scope of the review.
In 2021, the highest number of studies was published, with 12 studies, indicating robust research activity at the beginning of the period. The number declined somewhat in 2022 to 9 studies, suggesting a slight decrease in published research within the selected fields. However, research output rebounded in both

2023 and 2024, with 10 studies published in each year, signalling a renewed or sustained interest in the topic areas.

This distribution suggests a relatively stable research interest over the years, with fluctuations that are not overly pronounced. It may reflect ongoing research efforts, funding cycles, or emerging trends influencing publication rates during these years. Understanding this temporal spread helps to contextualise the review within recent scholarly developments.

DISCUSSION OF THE STUDY

The present systematic review provides insight into the evolving research landscape between 2021 and 2024, with a total of 41 peer-reviewed studies meeting the inclusion criteria. The disciplinary distribution reflected a dominant emphasis on orthopaedics (12 studies) and rehabilitation (10 studies), indicating that these two areas remain central to contemporary clinical and translational research. This predominance aligns with findings from recent bibliometric studies, which show that musculoskeletal and rehabilitation sciences have seen increased output in the past decade, driven mainly by the rising global burden of disability and injuries (Dyer et al., 2023). The strong representation of rehabilitation research highlights growing awareness of functional recovery, patient-centred outcomes, and long-term quality of life. This is consistent with global health priorities that emphasise not only acute care but also functional adaptation and integration of multidisciplinary rehabilitation practices across healthcare systems (World Health Organisation [WHO], 2023). The relatively lower representation of fields such as biochemistry, physiology, and pharmacology (one study each) suggests that while mechanistic and laboratory-focused research contributes to the knowledge base, the immediate clinical and applied dimensions—particularly orthopaedics and rehabilitation—remain dominant. The temporal distribution of publications also contributes to an understanding of research patterns. The peak in 2021 (12 studies) possibly reflects a backlog of research dissemination due to pandemic-related disruptions in 2020, which may have delayed publication cycles (Kang et al., 2022). The subsequent dip in 2022 (9 studies) might be explained by shifting research priorities or funding reallocations during and after the COVID-19 pandemic. However, the rebound observed in 2023 and 2024 (10 studies each) suggests a stabilization and renewed commitment to research within the identified domains. These modest fluctuations are consistent with global publication trends observed after 2020, showing that healthcare research output initially slowed but then realigned toward sustained growth (Chahrour et al., 2020) Importantly, the observed disciplinary concentration has implications for research gaps. Fields such as public environmental health, ophthalmology, and nuclear medicine were minimally represented. Overall, the findings emphasize that while orthopaedics and rehabilitation research are expanding robustly, there is an opportunity for greater interdisciplinary convergence. Cross-cutting integration with public health, physiology, and psychological sciences may enhance holistic patient outcomes and reduce existing knowledge fragmentation.

CONCLUSION

This systematic review of 41 studies (2021–2024) found basketball injury research heavily concentrated in orthopaedics and rehabilitation. Publication trends peaked in 2021, dipped in 2022, and stabilized in 2023–2024, likely reflecting pandemic disruptions. Notable gaps exist in interdisciplinary approaches, particularly in public health, biochemistry, and psychology. Future research should prioritize cross-disciplinary collaboration to improve injury prevention strategies across all competitive levels.

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