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A Scoping Review of Clinical Trials on the Efficacy of Curcumin and Its Formulations for Wound Healing

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ABSTRACT

Background: Curcumin, the main component of turmeric, may be effective in wound healing due to its anti-inflammatory and antibacterial effects. Although pre-clinical studies are promising, a comprehensive clinical review is lacking. This scoping review examines clinical trials on the efficacy of curcumin in wound healing.

Method: This study was conducted in accordance with the PRISMA-ScR guidelines and involved a comprehensive search of PubMed, Scopus, Web of Science, and Cochrane Library databases for clinical trials on various forms of curcumin for wound healing in humans, from January 1, 2000 to May 31, 2025.

Results: A total of 920 results were retrieved through the search, of which 19 clinical trials met the predefined inclusion and exclusion criteria and were included in our study. Most studies (14 out of 19) were randomized controlled trials. Curcumin was used in various dosages and treatment durations, and in multiple forms, including topical and oral formulations. Curcumin improved wound healing compared to placebo or conventional care in 89% of the studies. Additionally, no adverse events were reported in 84% of the studies, with minor and temporary side effects observed in the remaining cases.

Conclusions: According to the findings of the current study, curcumin is a safe and effective adjuvant for improving wound healing. However, the significant heterogeneity observed among clinical trials limits the ability to develop consistent treatment guidelines. Future studies should focus on large-scale, standardized trials to better define the role of curcumin in wound care.

1 | Introduction

Human skin is the body's first line of defense against environmental stresses and also plays an essential role in maintaining physiological homeostasis and immunity [1]. A wound, a disruption of this vital barrier, can be classified as acute, resolving within a few weeks, or chronic, in which the healing process may persist for months due to persistent inflammation [2–4]. Chronic wounds have become a major public health concern in the past decades due to their high prevalence, primarily resulting from an aging population and the significant rise in obesity and systemic disorders such as diabetes, heart failure, and peripheral artery disease [5, 6]. Recent studies indicate that 1%–2% of individuals suffer from chronic wounds during their life time [7]. This issue imposes a substantial clinical and financial burden on healthcare systems, with annual treatment costs

exclusion of non-English publications, along with the potential for publication bias, may have further limited the scope of our findings.

5 | Conclusions

This extensive scoping study highlights the safety and effectiveness of curcumin as an adjunctive therapy for enhancing wound healing in various contexts. The available clinical evidence consistently demonstrates beneficial outcomes, including faster healing and reduced inflammation, supported by an excellent safety profile with minimal side effects. However, a major issue identified is the considerable variation among the trials examined, particularly regarding curcumin formulations, dosages, and outcome measures. This variability reduces our ability to establish consistent, evidence-based clinical guidelines. Future studies should focus on large-scale, standardized trials, systematic reviews along with meta-analyses, and network meta-analyses studies to better define the role of curcumin in wound care.

Author Contributions

M.M.P., N.F.H., designed the study. M.M.P., N.F.H., A.A., Y.D., M.A.S. collected the data. M.M.P., A.A., Y.D., M.A.S. drafted the manuscript. M.M.P., N.F.H., Y.D., M.A.S. finalized the manuscript. All authors reviewed the manuscript and approved the final version. They take full responsibility for the content and writing of this article.

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Ethics Statement

This study was approved by the Research Ethics Committee of Shiraz University of Medical Sciences (Ethics Code: IR.SUMS.MED.REC.1404.036).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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