

## Peer Review

# Review of: "Effect of Clown Therapy on Symptoms and Emotions of Children with Neoplastic Disease: A Systematic Review with Meta-Analysis"

Hany Akeel Al-hussaniy<sup>1</sup>

1. University of Baghdad, Iraq

This systematic review and meta-analysis addresses an important and often underexplored aspect of pediatric oncology care by evaluating the effectiveness of clown therapy as a nonpharmacological intervention for symptom and emotional management in children with neoplastic disease. The manuscript demonstrates several notable strengths, particularly its adherence to established methodological standards, including PRISMA reporting, PROSPERO registration, Cochrane RoB 2 bias assessment, and application of the GRADE framework to evaluate evidence certainty. The search strategy is comprehensive and multidisciplinary, covering a broad range of international databases and trial registries without language or date restrictions, which reduces the likelihood of selection bias and enhances transparency. Additionally, the authors provide clear outcome definitions and appropriate statistical techniques, including standardized mean difference calculation, heterogeneity analysis, and sensitivity considerations, supporting the methodological robustness of the quantitative synthesis.

The findings suggesting a potential beneficial effect of clown therapy on anxiety and emotional well-being are clinically relevant, particularly given the increasing emphasis on holistic and patient-centered supportive care in pediatric oncology. The authors appropriately interpret their results cautiously and avoid overgeneralization by clearly acknowledging the very low certainty of evidence and the substantial methodological limitations of the included trials. Their discussion of clinical heterogeneity, cultural variability, intervention standardization, and practitioner training variability reflects a mature and balanced interpretation of the evidence.

Despite these strengths, several methodological and interpretative limitations should be considered. The meta-analysis is based exclusively on quasi-randomized trials, all of which were assessed as having a high risk of bias, particularly regarding outcome measurement and lack of blinding. The extremely high statistical heterogeneity ( $I^2 > 90\%$  in several analyses) raises concerns regarding the validity of pooled effect estimates and suggests that combining results across studies with highly variable intervention protocols, outcome instruments, and participant characteristics may limit interpretability. Additionally, the inclusion of one study available only in abstract form restricts the ability to adequately assess methodological quality and intervention fidelity.

Another limitation relates to the broad variability in intervention delivery, including differences in professional training of clown therapists, duration and frequency of sessions, and individual versus group interaction formats. The absence of standardized intervention protocols and inconsistent reporting of contextual variables, such as parental presence and standard care procedures, reduces reproducibility and external validity. Furthermore, while the study highlights potential improvements in emotional outcomes, the clinical relevance of extremely large standardized effect sizes should be interpreted cautiously given the small sample sizes and high risk of performance and detection bias.

The manuscript could be further strengthened by deeper exploration of mechanistic pathways linking therapeutic humor, psychological stress reduction, neuroendocrine modulation, and immune function in pediatric oncology populations. Additionally, future research directions might benefit from emphasizing pragmatic multicenter randomized controlled trials, standardized intervention frameworks, and inclusion of long-term psychosocial and quality-of-life outcomes.

Overall, this review represents a valuable contribution to supportive pediatric oncology research by synthesizing emerging evidence on therapeutic clowning interventions. While current findings suggest promising benefits for anxiety and emotional well-being, the conclusions are appropriately conservative and highlight the urgent need for higher-quality randomized trials. The article offers meaningful insights for clinicians, researchers, and healthcare policymakers interested in integrative supportive care strategies, supporting its relevance and scholarly merit.

## Declarations

**Potential competing interests:** No potential competing interests to declare.