Benefits and Challenges of Gamification in Clinical Reasoning Skills of Medical Students Compared to Traditional Education: A Systematic Review

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ABSTRACT

Introduction: Clinical reasoning is one of the vital skills in medical education that enables doctors to make correct and timely decisions about diagnosis and treatment by analyzing the patient carefully. Due to the complexity and importance of this skill, there has always been interest in developing new educational methods to improve and strengthen it have always been of interest. One of these new methods is gamification, which in recent years has been recognized as an educational tool in various fields, including medical education. In this study, we examined the use of gamification and its positive and negative multifaceted effects in teaching clinical reasoning to medical students.

Search Strategy: For the systematic search of articles, first, keywords and phrases, synonyms and alternative keywords for gamification, game elements and features, clinical reasoning, and medical education were identified using thematic and lexical searches in MESH and Emtree. Based on these keywords, a list of 33 elements was compiled, utilizing the search strategy from the past five years in CINAHL, EMBASE, ERIC, Collection of Psychology and Behavioral Sciences, PsychINFO, PubMed, Cochrane Library, and Google Scholar. A total of 795 articles were initially identified, of which 367 articles remained after removing duplicates. Only articles that investigated gamification in the context of clinical reasoning through intervention were included, while those that explored other contexts or targeted population outside of medical students were excluded. Two individuals independently validated the remaining articles using the CONSORT checklist.

Results: Overall, 41 studies were included in the review after validation and qualitatively assessed using the Cochrane risk of bias tool. Research showed that gamification can help improve clinical skills by 20-30%, increase motivation and self-confidence by 15-20%, and increase team participation by 10%. Students trained with this method achieved better performance in clinical evaluations and an increase of 10-35% in clinical evaluation scores. Despite the apparent benefits, this educational approach led to disappointing outcomes, including a failure to maintain long-term knowledge, issues with fake attendance, the potential for fatigue, the emergence of unhealthy competition, a diminished focus on content, the risk of addiction, and privacy violations.

Conclusion and Discussion: Many published works in medical education mainly focus on participants' engagement and satisfaction and changes in knowledge scores from pre-tests to post-tests. However, they often overlook advanced learning objectives, such as long-term knowledge retention and behavior change. More multicenter studies should assess participants' behaviors, the influence of environmental and individual factors, and the cost-effectiveness of gamification within the healthcare system to evaluate educational effectiveness at levels three and four of the Kirkpatrick model.

Keywords: Clinical reasoning, Gamification, Medical education