

## Promoting Mental Health in Children and Adolescents through Digital Technology: A Systematic Review and Meta-analysis

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### ADMINISTRATIVE INFORMATION

**Support** - None.

**Review Stage at time of this submission** - Completed but not published.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY2023120004

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 01 December 2023 and was last updated on 01 December 2023.

### INTRODUCTION

**Review question / Objective** The present study reviews research from the past decade on digital technology for promoting adolescent mental health. A systematic literature review and meta-analysis are used to explore which types and features of technology can enhance mental health. This study emphasizes the role and value of digital technology in promoting mental health and offers practical experience and guidance for developing mental health in adolescents. This study seeks to answer the following research questions:

1. What is the current status of global research on digital technology for promoting children and adolescent mental health?
2. What digital technology characteristics support the development of mental health among children and adolescents?

How effective is digital technology in promoting the mental health of children and adolescents? What factors have an impact on the effectiveness of digital technology interventions?

**Condition being studied** Condition being studied is mental health of children and adolescents.

### METHODS

**Search strategy** A literature search will be conducted according to the standard systematic literature review process. Articles will be retrieved from the core collection of the Web of Science and Springer Link online database to ensure the quality of the article. Articles will be limited to those written in English and published between January 2013 and May2023. The following search terms will be used: (a) "mental health" or "psychological health" or "psychological wellbeing" ;(b)

"technology" or "technological" or "technologies" or "digital media" ;(c)"K-12" or "teenager" or "adult" or "adolescents" or "youth". Using these search criteria, a total of 1032 articles will be retrieved.

**Participant or population** Children and adolescents younger than 18 year old.

**Intervention** Digital technology based intervention program.

**Comparator** Traditional intervention programs or no program at all.

**Study designs to be included** Empirical studies such as experiment, observational studies, cross-sectional studies, case studies, and survey studies will be included.

**Eligibility criteria** Between January 2013 and July 2023, empirical studies were published in English examining the use of digital technology for learning purposes among children and adolescents. These studies focused on one or more aspects of mental health.

**Information sources** Web of Science and Springer Link Core Collection Database: SSCI, SCIE, ESCI, and ACHI databases.

**Main outcome(s)** Change in mental health assessment score from baseline to the last available follow-up. Overall effect of digital technology interventions and moderating factors. Levels of mental health measured by self-reported rating, interview or observed behaviors.

**Quality assessment / Risk of bias analysis** We will assess and report on the potential for publication bias, which arises from the selective publication of studies with positive results. Use methods like funnel plots, Begg's test, and the trim and fill method to evaluate publication bias.

**Strategy of data synthesis** After deciding on the coding protocol dimension, two researchers will code five articles and discussed any uncertainties during the coding process in detail to ensure a common understanding between the two coders. The two researchers will then code separately, with the first round of coding being completed within 2 weeks. During the coding process, the two coders will remain in constant communication and jointly resolve any coding uncertainties when they arise. During the coding process, any areas that are difficult for both coders to determine will be recorded and then subsequently discussed with an

expert. Following expert guidance, both coders will undertake secondary coding. This primarily will involve addressing any gaps in the coding table and ensuring the accuracy of the previous coding. The entire coding process is expected to complete within one month.

**Subgroup analysis** No applicable.

**Sensitivity analysis** Sensitivity analysis inclusion/exclusion criteria and employment of different statistical methods/effect sizes. If these two measures do not substantially affect the results, the findings can be considered relatively stable. However, if the results are highly sensitive to these variations, further exploration and explanation of these discrepancies will be conducted.

**Country(ies) involved** China.

**Keywords** mental health problems, teenagers, digital technology, systematic literature review, meta-analysis.

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