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Opportunities and Risks of Generative AI for High-School Students' Mental Health: A Scoping Review Protocol

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ADMINISTRATIVE INFORMATION

Support - Huainan Normal University.

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Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 August 2026 and was last updated on 28 August 2026.

INTRODUCTION

Review question / Objective Primary Research Question:
What are the reported opportunities and risks of generative AI applications for the mental health of high school students?

PCC Framework:
Population (P): High school students (adolescents aged approximately 14–18 years, from any country or region worldwide).
Concept (C): Opportunities (e.g., personalized support, accessibility) and risks (e.g., dependency, misinformation, privacy concerns) of generative AI (e.g., LLMs, chatbots).
Context (C): Educational settings, mental health interventions, and daily life contexts affecting student well-being.

Objective:
To map the existing literature regarding the impact of generative AI on high school students' mental health and identify gaps for future research and policy-making.

Background In recent years, generative AI tools such as large-language models and chatbots have rapidly gained global popularity and become highly accessible to adolescent populations. High-school students aged 14–18 years constitute one of the major user groups of these emerging digital technologies, both for educational purposes and in their daily lives. Generative-AI carries considerable potential benefits for adolescents' learning experience and mental well-being, including personalised learning support, improved access to information, and readily-available emotional-assistance resources. Nevertheless, growing scholarly attention has been drawn to its potential mental-health risks, such as technological dependency, exposure to misinformation, privacy-security concerns, elevated anxiety levels and reduced opportunities for in-person social interaction. While an increasing number of primary studies have investigated the mental-health-related

outcomes of generative-AI use among adolescents worldwide, existing evidence remains scattered across countries, research disciplines and publication types. To date, no scoping review has systematically mapped both the positive opportunities and adverse mental-health risks associated with generative-AI use, with a specific focus on high-school-student populations globally.

Rationale A scoping review methodology is well-suited to this research topic, given that the available body of evidence is broad, heterogeneous and has not yet undergone systematic synthesis. This review aims to identify, collate and organise international empirical and theoretical literature exploring mental-health-related opportunities and risks of generative-AI for high-school students. By charting dominant research themes, outcome categories, the geographical distribution of primary studies and existing research limitations, this work will clarify the current state-of-the-art and identify key unresolved research gaps. Its findings may provide actionable references for educators, youth mental-health practitioners, technology developers and policymakers across world-regions, supporting the development of evidence-informed guidelines for safe and beneficial generative-AI engagement among adolescents. Without this comprehensive mapping exercise, future investigations risk remaining fragmented, and practical guidance on generative-AI usage for high-school students will continue to lack a holistic evidence base.

METHODS

Strategy of data synthesis Search Strategy:
Following PRISMA-ScR guidance, the literature search will be conducted across six discipline-complementary electronic databases, covering multidisciplinary, educational, and psychological domains to ensure comprehensive coverage of relevant evidence. Web of Science Core Collection and Scopus will be adopted as high-coverage multidisciplinary citation databases to retrieve high-impact, international peer-reviewed studies concerning educational technology, adolescent development, and mental health. Two specialized educational databases via EBSCOhost, namely ERIC and Education Source, will be employed to capture secondary education and student-focused studies, providing authoritative literature on school-based generative AI application and adolescent learning contexts. APA PsycInfo via ProQuest will be included as the core psychological database to systematically collect empirical evidence on adolescents' mental health, emotional outcomes, and psychological well-being. The ProQuest Education Collection within the ProQuest Social Science Premium Collection will serve as a supplementary source to enrich educational and social science literature and reduce retrieval omission. Searches will be restricted to English-language, peer-reviewed journal articles published from January 2022 until the search date.
Three conceptual blocks will be combined using Boolean operators:
Block A (Generative-AI terms): (ChatGPT OR "generative AI" OR "generative artificial intelligence" OR GenAI OR "large language model*" OR LLM* OR GPT OR "GPT-3" OR "GPT-4" OR "AI chatbot" OR "conversational AI")
Block B (Population terms): ("high school student*" OR "secondary school student*" OR adolescent* OR teenager* OR "upper secondary" OR "grade 10" OR "grade 11" OR "grade 12")
Block C (Mental-health-related outcomes): ("mental health" OR "well-being" OR "well being" OR anxiety OR depression OR stress OR "psychological distress" OR "emotional health" OR "social isolation" OR "emotional support" OR resilience OR self-efficacy)
Records will be retrieved by combining the three blocks: A AND B AND C.
Study Selection Process:
All search outputs will be exported to EndNote for systematic deduplication. Two independent reviewers will screen titles and abstracts against the pre-specified eligibility criteria. Potentially relevant records will proceed to full-text assessment. Disagreements at both screening stages will be resolved through consensus discussion, with unresolved conflicts adjudicated by a third reviewer. The entire screening workflow will be documented and presented in a PRISMA-ScR flow diagram.
The reporting of this scoping review will follow the PRISMA extension for Scoping Reviews (PRISMA-ScR) checklist.
Data Charting and Synthesis:
A standardised data-charting form will be developed to extract key information from included studies, including author(s) and publication year, study country, research design, participant characteristics, generative AI tool type, reported mental-health opportunities and risks, and core study conclusions. Extracted data will be synthesised through descriptive evidence mapping and inductive thematic analysis. All findings will be structured around two overarching themes: (1) mental-health-related opportunities, including accessible emotional support, improved information availability, and personalised psychological and learning support; and (2) mental-health-related risks, including technological

dependency, misinformation exposure, privacy concerns, and increased social isolation. Finally, existing research gaps will be summarised and targeted directions for future studies and educational practice will be outlined.

Eligibility criteria Studies will be included if they meet the following criteria based on the PCC (Population, Concept, Context) framework:
Participants (Population)
Inclusion: High school students (adolescents typically aged 14–18 years) enrolled in secondary education globally. Studies involving broader adolescent populations (e.g., 12–18 years) will be included if data for the high-school-aged subgroup can be extracted or if more than 80% of the sample falls within the target age range.
Exclusion: Studies focusing exclusively on university/college students, elementary school children, adults, or non-student populations.
Concept
Inclusion: Studies investigating the use of generative artificial intelligence (GenAI) tools (e.g., LLMs like ChatGPT, GPT-4, Gemini, Claude; AI chatbots; conversational AI) and reporting on mental-health-related outcomes.
Opportunities: Emotional support, well-being enhancement, help-seeking, resilience, self-efficacy.
Risks: Anxiety, depression, psychological distress, isolation, dependency, privacy concerns, harmful content exposure.
Exclusion: Studies focusing solely on traditional AI (i.e., non-generative AI, such as rule-based systems, decision trees, or machine-learning models that do not generate novel content); studies focusing solely on academic performance without mental-health outcomes; technical system-development papers without human-participant data.
Context
Inclusion: Any context relevant to high school students, including educational settings (schools, classrooms, online-learning environments), mental-health interventions, or personal daily-life contexts involving GenAI use.
Geography: No geographical or cultural restrictions will be applied. Studies from any country or region will be considered for inclusion.
Types of Sources
Inclusion: Peer-reviewed journal articles, including original research (qualitative, quantitative, mixed-methods) and review articles. Review articles (systematic reviews, scoping reviews, narrative reviews) will be included as contextual evidence for background and discussion, but will not be treated as primary evidence for data charting.
Exclusion: Editorials, commentaries, opinion pieces, conference abstracts, theses/dissertations, book chapters, and non-peer-reviewed reports. Studies focusing solely on teacher perspectives or institutional implementation without student-level mental-health data. Duplicate publications (only the most complete version will be retained).
Language
Studies published in English will be included.
Timeframe
Studies published from January 2022 onward (coinciding with the widespread emergence and public availability of GenAI tools) will be included.

Source of evidence screening and selection
The source selection process will be conducted in accordance with the PRISMA-ScR guidelines and consists of the following stages:
Stage 1: Deduplication. All records retrieved from the six databases will be exported to Zotero. Duplicate records will be identified and removed systematically using Zotero's built-in duplicate detection function, followed by manual checking to ensure accuracy.
Stage 2: Title and abstract screening. Two independent reviewers will screen all remaining records by title and abstract against the pre-specified eligibility criteria. Each record will be assessed for relevance to the PCC framework: (1) Does it involve high-school-aged adolescents (14–18 years old)? (2) Does it address generative artificial intelligence (GenAI)? (3) Does it report mental-health-related opportunities or risks? Records that clearly fail to meet any of these criteria will be excluded. Records where relevance is unclear from the title and abstract alone will be retained for full-text assessment.
Stage 3: Full-text screening. Full texts of all potentially relevant records will be retrieved and assessed independently by the same two reviewers against the full eligibility criteria. Each full-text article will be evaluated for substantive engagement with both GenAI and mental health outcomes, not merely superficial mention. Reasons for exclusion at this stage will be documented and reported.
Stage 4: Disagreement resolution. Disagreements arising at both screening stages will be resolved through consensus discussion. If consensus cannot be reached after discussion, a third reviewer will adjudicate the final decision. Inter-rater agreement at the title/abstract stage will be calculated using Cohen's kappa and reported to ensure screening reliability.
All screening decisions, including the number of records excluded at each stage with reasons, will be documented and presented in a PRISMA-ScR flow diagram. The process will be managed using

reference management software (Zotero) and spreadsheet tools (Microsoft Excel) to track decisions and maintain an audit trail. No automation tools or AI-assisted screening will be used.

Data management All data generated and analyzed during this scoping review will be managed systematically to ensure transparency, reproducibility, and auditability.

Search records: The full search strategies for each of the six databases will be documented and stored, including the exact search strings, filters applied, and dates of retrieval. All search results will be exported to Zotero for reference management and deduplication and saved in RIS or CSV formats for subsequent screening.

Screening records: Deduplication decisions will be recorded in Zotero. Title-and-abstract and full-text screening decisions will be tracked using Microsoft Excel, with each record coded as "include", "exclude", or "unsure". Reasons for exclusion at the full-text screening stage will be documented. A PRISMA-ScR flow diagram will summarise the study-selection process.

Data charting: A standardised data-charting form will be developed in Microsoft Excel to extract key information from the included studies. The complete charting matrix will be kept as a supplementary file and made available upon publication.

Audit trail: All screening and charting decisions will be recorded with reviewer identifiers and timestamps to maintain a clear audit trail. No changes to eligibility decisions will be made without documented justification.

Data sharing: The complete charting matrix and supplementary materials will be made available alongside the final review. Full-text PDFs of included studies will not be shared owing to copyright restrictions.

All study-related data will be stored securely on institutional storage with regular backups and permanently archived for future reference.

Reporting results / Analysis of the evidence The data analysis will follow the methodological framework for scoping reviews proposed by Arksey and O'Malley (2005) and the PRISMA-ScR guidelines (Tricco et al., 2018). Consistent with scoping-review methodology, a formal quality assessment or risk-of-bias appraisal of individual included studies will not be conducted, as the primary aim is to map the extent, range, and nature of available research rather than to critically appraise study validity. No quantitative meta-analysis will be performed.

Descriptive Numerical Analysis:

A descriptive numerical summary will be performed to report the volume and basic characteristics of the retrieved literature, including publication trends over time (the number of studies per year), geographical distribution of included studies, study designs (qualitative, quantitative, mixed-methods), and specific generative-AI tools investigated (e.g., ChatGPT, Bard, custom chatbots). All descriptive analyses will be conducted using Microsoft Excel.

Thematic Analysis:

An inductive thematic analysis will be conducted to synthesise findings related to mental-health outcomes for high-school-aged adolescents. Data coding will be guided by the research objectives structured around opportunities, risks and contextual factors. Opportunity-related themes may cover emotional support, stigma reduction and service accessibility. Risk-related themes will include privacy concerns, technology dependency, AI-generated misinformation (hallucinations), and social isolation. Contextual-factor themes will explore how usage settings (e.g., school versus home) shape mental-health impacts.

Coding and thematic analysis will be managed in Microsoft Excel. To enhance coding reliability, two reviewers will independently code a subset of included studies. Discrepancies will be resolved through consensus discussion. The final results will be presented as a narrative synthesis linking generative-AI features to specific mental-health impacts on high-school-aged adolescents.

Presentation of the results Results will be presented in both narrative and visual formats to ensure clarity and accessibility.

PRISMA-ScR flow diagram: A PRISMA-ScR flow diagram will be included to document the full screening process, showing the number of records identified, screened, excluded (with reasons), and ultimately included.

Summary table of included studies: A comprehensive characteristics table will be developed to present key information for each included study. The table will include the following columns: author(s) and year, country, study design, sample characteristics of high-school-aged adolescents, generative-AI tool investigated, reported mental-health opportunities, and reported mental-health risks. This table will allow readers to view the evidence base at a glance.

Visual and thematic summary: Descriptive charts (e.g., bar charts or maps) will visualise publication trends and geographical distribution. Narrative findings will be organised by the two overarching analytical themes--opportunities and risks--with supporting evidence and representative study citations. A conceptual-framework figure may be

developed, if appropriate, to illustrate the relationships among generative-AI use, mediating factors, and mental-health outcomes.
All modifications to the planned presentation format during the conduct of the review will be documented and explained in the final manuscript.

Language restriction Yes, only English language studies will be included.

Country(ies) involved China.

Other relevant information This scoping review will be conducted in accordance with the PRISMA-ScR reporting guidelines. No potential conflicts of interest are declared.

Keywords generative-AI; high-school students; mental health; opportunities; risks.

Dissemination plans The primary dissemination plan is to publish the findings in a peer-reviewed open-access journal, specifically targeting Behavioral Sciences, given its focus on the intersection of technology and human behavior. Additionally, results will be presented at relevant academic conferences on digital health or adolescent psychology. Key insights regarding GenAI risks and opportunities will also be summarized for educators and school counselors to support safe AI integration in educational settings.

Contributions of each author

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