

# Scientific and Health Misinformation on Social Media and Adolescent Development: A Systematic Review of Exposure, Perceptions, Behavioral Responses, and Health-Related Outcomes

## *Desinformación Científica y Sanitaria en Redes Sociales y el Desarrollo Adolescente: Una Revisión Sistemática sobre Exposición, Percepciones, Respuestas Conductuales y Resultados Relacionados con la Salud*

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### ABSTRACT

**Introduction:** Adolescents are increasingly exposed to scientific and health-related misinformation through social media platforms, where algorithmically amplified and emotionally charged content may influence psychosocial development, health behaviors, and decision-making processes. Despite growing concern regarding this phenomenon, evidence remains fragmented across health domains, digital contexts, and methodological approaches.

**Objective:** To synthesize and critically appraise the available evidence regarding the exposure, circulation, interpretation, and impact of scientific and health-related misinformation disseminated through social media platforms among adolescents, with emphasis on psychosocial, behavioral, cognitive, educational, and health-related outcomes.

**Methods:** A systematic review was conducted according to the PRISMA 2020 statement. Electronic searches were performed in PubMed, Embase, Scopus, Web

of Science, and Cochrane Library up to May 10, 2026. Eligible studies evaluated adolescents exposed to scientific or health-related misinformation within social media or digital environments. Methodological quality was assessed using Joanna Briggs Institute critical appraisal tools. Due to substantial heterogeneity, findings were synthesized narratively.

**Results:** Twenty-eight studies were included. Quantitative cross-sectional studies predominated, although mixed-methods, qualitative, and experimental investigations were also identified. Misinformation domains primarily included scientific, health-related, vaccine-related, and COVID-19-related misinformation. Exposure to misinformation was consistently associated with psychosocial distress, anxiety, fear, institutional distrust, misinformation susceptibility, vaccine hesitancy, maladaptive health behaviors, and reduced critical appraisal abilities. Adolescents frequently relied on socially mediated credibility heuristics rather than systematic verification strategies when evaluating online information. Digital literacy deficits, peer influence, algorithmic amplification, and emotionally valenced content emerged as recurrent mechanisms increasing vulnerability to misinformation. Educational and media literacy interventions demonstrated beneficial effects by improving critical evaluation competencies and misinformation resilience.

**Conclusions:** Scientific and health-related misinformation circulating through social media environments appears to exert multidimensional effects on adolescent development, particularly within psychosocial, behavioral, and cognitive domains. Strengthening digital health literacy, critical thinking, and evidence-based educational interventions may represent essential strategies for reducing misinformation vulnerability and promoting healthier digital environments for adolescents.

**Keywords:** Communication; Social Media; Adolescent Behavior; Health; Population Groups; Internet.

## RESUMEN

**Introducción:** Los adolescentes están cada vez más expuestos a desinformación científica y sanitaria a través de plataformas de redes sociales, donde el contenido amplificado algorítmicamente y cargado emocionalmente puede influir en el desarrollo psicosocial, los comportamientos de salud y los procesos de toma de decisiones. A pesar de la creciente preocupación respecto a este fenómeno, la evidencia permanece fragmentada entre distintos dominios de salud, contextos digitales y enfoques metodológicos.

**Objetivo:** Sintetizar y evaluar críticamente la evidencia disponible sobre la exposición, circulación, interpretación e impacto de la desinformación científica y sanitaria difundida a través de plataformas de redes sociales entre adolescentes, con énfasis en resultados psicosociales, conductuales, cognitivos, educativos y relacionados con la salud.

**Métodos:** Se realizó una revisión sistemática de acuerdo con la declaración PRISMA 2020. Se efectuaron búsquedas electrónicas en PubMed, Embase, Scopus, Web of

Science y Cochrane Library hasta el 10 de mayo de 2026. Se incluyeron estudios que evaluaron adolescentes expuestos a desinformación científica o sanitaria dentro de entornos digitales o de redes sociales. La calidad metodológica fue evaluada mediante las herramientas de evaluación crítica del Joanna Briggs Institute. Debido a la considerable heterogeneidad, los hallazgos fueron sintetizados narrativamente.

**Resultados:** Se incluyeron veintiocho estudios. Predominaron los estudios cuantitativos transversales, aunque también se identificaron investigaciones mixtas, cualitativas y experimentales. Los dominios de desinformación incluyeron principalmente desinformación científica, sanitaria, relacionada con vacunas y asociada a COVID-19. La exposición a la desinformación se asoció consistentemente con malestar psicosocial, ansiedad, miedo, desconfianza institucional, susceptibilidad a la desinformación, vacilación vacunal, conductas de salud desadaptativas y disminución de las capacidades de evaluación crítica. Los adolescentes frecuentemente dependieron de heurísticas de credibilidad mediadas socialmente en lugar de estrategias sistemáticas de verificación al evaluar información en línea. Las deficiencias en alfabetización digital, la influencia de pares, la amplificación algorítmica y el contenido emocionalmente cargado emergieron como mecanismos recurrentes que incrementaban la vulnerabilidad frente a la desinformación. Las intervenciones educativas y de alfabetización mediática demostraron efectos beneficiosos al mejorar las competencias de evaluación crítica y la resiliencia frente a la desinformación.

**Conclusiones:** La desinformación científica y sanitaria que circula a través de entornos de redes sociales parece ejercer efectos multidimensionales sobre el desarrollo adolescente, particularmente en los dominios psicosocial, conductual y cognitivo. El fortalecimiento de la alfabetización digital en salud, el pensamiento crítico y las intervenciones educativas basadas en evidencia podrían representar estrategias esenciales para reducir la vulnerabilidad frente a la desinformación y promover entornos digitales más saludables para los adolescentes.

**Palabras clave:** Comunicación; Redes Sociales; Conducta del Adolescente; Salud; Grupos Poblacionales; Internet.

## INTRODUCTION

Adolescents are increasingly immersed in digital environments in which social media platforms have become major sources of health, scientific, and lifestyle information. Although these platforms facilitate rapid access to educational content and peer interaction, they also enable the widespread dissemination of misinformation and disinformation, frequently without adequate mechanisms for verification or contextualization. The algorithmic amplification of emotionally charged and highly engaging content has intensified adolescents' exposure

to inaccurate or misleading information related to health, science, nutrition, vaccination, mental health, sexuality, and body image, thereby raising concerns regarding its potential influence on adolescent development and health-related decision-making (Ma et al., 2026; Wang, 2024).

Current evidence suggests that scientific and health-related misinformation circulating through social media may negatively affect multiple dimensions of adolescent wellbeing. Adolescents are continuously exposed to large volumes of conflicting health information, which may contribute to stress, confusion, information overload, and reduced trust in reliable scientific sources (Ma et al., 2026; Wang, 2024). Furthermore, the developmental characteristics of adolescence, including ongoing cognitive maturation, emotional sensitivity, and identity formation, may increase vulnerability to persuasive or misleading online content. Previous studies have highlighted that misinformation exposure during adolescence may represent a broader threat to psychological wellbeing and healthy developmental trajectories (Ma et al., 2026; Wang, 2024).

Among the most frequently investigated domains, body image and nutrition-related misinformation have emerged as highly relevant concerns. Social media influencers, targeted marketing strategies, and appearance-centered content frequently promote unrealistic aesthetic standards, unbalanced dietary practices, and misleading health advice. Exposure to such content has been associated with body dissatisfaction, confusion regarding healthy lifestyle behaviors, and potentially harmful eating patterns among adolescents (Pepping et al., 2026; Štiková & Kysel, 2025). Nevertheless, evidence also suggests that the effects of social media exposure may be heterogeneous, as some adolescents report positive behavioral changes or increased motivation toward healthier lifestyles, whereas others experience psychological pressure to conform to unattainable ideals, increasing the risk of disordered eating behaviors (Štiková & Kysel, 2025).

Health misinformation has additionally been associated with changes in concrete health-related behaviors. Studies have demonstrated that misinformation disseminated through social media may influence vaccine attitudes and knowledge, particularly regarding human papillomavirus vaccination (Apata et al., 2026), contribute to misconceptions surrounding sexual and reproductive health and HIV-related stigma (Waldmann et al., 2025), and affect behaviors related to electronic cigarette use and vaping uptake among adolescents (Maturó & Gaiha, 2025). In some cases, social media-driven misinformation has also contributed to delayed professional healthcare seeking, resulting in worsening clinical conditions (Rivetti et al., 2025).

The mechanisms underlying the spread and impact of misinformation among adolescents appear to be multifactorial. Influencer authority, emotionally valenced communication, entertainment-oriented engagement patterns, targeted advertising, and limitations in critical appraisal skills may collectively increase susceptibility to misinformation exposure and

sharing behaviors (Feijoo et al., 2023; Pepping et al., 2026; Wang et al., 2025). Additionally, parental concerns regarding adolescents' ability to critically evaluate online information have been reported, particularly within rapidly evolving digital ecosystems such as TikTok and similar platforms (Feijoo et al., 2023). Experimental and mixed-methods evidence has further suggested that interventions including targeted accuracy prompts, platform-level warnings, and media literacy strategies may reduce adolescents' willingness to believe or disseminate misinformation, although such interventions require developmental adaptation and contextual sensitivity (Maturo & Gaiha, 2025; Wang et al., 2025).

Despite the growing body of literature addressing misinformation in digital environments, evidence remains fragmented across different health domains, platforms, and methodological approaches. Existing studies vary considerably in terms of misinformation topics, adolescent populations, outcome measures, and conceptual definitions, limiting the integration of findings and the identification of broader developmental implications. Consequently, a comprehensive synthesis of the available evidence is required to better understand how scientific and health-related misinformation circulating through social media environments may influence adolescent development, wellbeing, perceptions, and health behaviors.

Given the growing dependence of adolescents on digital and social media ecosystems for health-related information, understanding the developmental and behavioral implications of misinformation exposure has become increasingly relevant from both public health and educational perspectives. Therefore, the present systematic review sought to comprehensively synthesize the available evidence regarding scientific and health misinformation on social media and its influence on adolescent development and health-related outcomes.

### ***Research Question***

How has exposure to scientific and health-related misinformation disseminated through social media platforms influenced adolescents' cognitive, behavioral, psychosocial, and health-related outcomes?

### ***Objective***

The objective of this systematic review was to synthesize and critically appraise the available evidence regarding the exposure, circulation, interpretation, and impact of scientific and health-related misinformation disseminated through social media platforms among adolescent populations, with particular emphasis on behavioral, psychosocial, educational, and health-related outcomes.

## METHODOLOGY

### *Study Design*

The review methodology was developed and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement (Page et al., 2021).

A systematic review was conducted to identify, synthesize, and critically evaluate the available evidence regarding exposure to scientific and health-related misinformation on social media during adolescence, a developmental stage characterized by ongoing cognitive, emotional, psychosocial, and behavioral maturation. The review particularly focused on the developmental implications of misinformation exposure within digital environments, including its potential influence on emotional wellbeing, health-related decision-making, digital literacy, peer influence dynamics, and psychosocial functioning. The research additionally considered emerging digital phenomena, including algorithmic content amplification and AI-generated misinformation within adolescent online environments.

## ELIGIBILITY CRITERIA

### *Inclusion Criteria*

Studies were considered eligible when they fulfilled the following criteria:

- Investigated adolescent populations, preferentially between 10 and 19 years of age, corresponding to a developmental period characterized by identity formation, emotional regulation processes, evolving critical evaluation abilities, and increased susceptibility to social influence. Studies including mixed populations of adolescents and young adults were also considered eligible when adolescent-specific findings could be identified or when the mean age predominantly corresponded to adolescent participants.
- Studies including adult participants, parents, teachers, healthcare workers, or mixed community populations were considered eligible when adolescent-related digital misinformation exposure, adolescent health decision-making, youth-oriented educational interventions, or adolescent-relevant psychosocial outcomes constituted a central analytical component of the study.
- Evaluated exposure, interaction, circulation, interpretation, perception, or consumption of scientific or health-related misinformation disseminated through social media or digital communication environments.
- Included social media platforms or digital ecosystems such as TikTok, Instagram, YouTube, Facebook, X/Twitter, Reddit, Snapchat, WhatsApp, social media and digital communication environments, or comparable digital platforms.

- Assessed outcomes associated with adolescent developmental domains, including psychosocial functioning, emotional wellbeing, behavioral responses, health-related attitudes, digital literacy, risk perception, identity construction, peer influence processes, cognitive appraisal of online information, educational consequences, or health-related decision-making associated with misinformation exposure.
- Employed primary research designs, including qualitative studies, cross-sectional studies, cohort studies, mixed-methods investigations, ethnographic studies, surveys, experimental studies, or content-analysis approaches.
- Were published in peer-reviewed journals without language restrictions.

### ***Exclusion Criteria***

Studies were excluded when they:

- Focused exclusively on adult populations without distinguishable adolescent data.
- Addressed misinformation unrelated to scientific, medical, or health-related content.
- Evaluated traditional media without a social media or digital platform component.
- Corresponded to narrative reviews, systematic reviews, editorials, opinion articles, conference abstracts without sufficient methodological information, letters to the editor, protocols, or theoretical essays.
- Did not report developmental, psychosocial, behavioral, cognitive, educational, or health-related outcomes associated with misinformation exposure among adolescents.

### ***Information Sources and Search Strategy***

A comprehensive electronic search was conducted across PubMed, Embase, Scopus, Web of Science, and Cochrane Library to identify studies evaluating scientific and health-related misinformation within adolescent social media environments. The final electronic search was performed on May 10, 2026.

The search strategy combined controlled vocabulary terms and free-text keywords related to three principal domains: adolescents, misinformation, and social media. Search terms included combinations of descriptors such as “adolescent”, “teenager”, “youth”, “misinformation”, “disinformation”, “fake news”, “health misinformation”, “scientific misinformation”, “social media”, “TikTok”, “Instagram”, “YouTube”, “Twitter/X”, “Reddit”, and “digital platforms”. Detailed database-specific search strategies and electronic queries are provided in Supplementary File 1.

Reference lists of potentially eligible studies were additionally screened manually to identify further relevant publications.

### ***Study Selection***

All retrieved records were exported to a reference management software and duplicate records were removed prior to screening. Study selection was conducted in two sequential phases.

Initially, titles and abstracts were independently screened according to the predefined eligibility criteria. Subsequently, full-text assessment of potentially eligible studies was performed to determine final inclusion. Disagreements between reviewers were resolved through discussion and consensus.

Particular attention was given to the identification of studies specifically addressing developmental, psychosocial, educational, behavioral, or emotional dimensions associated with adolescent exposure to misinformation in digital environments.

### ***Data Extraction***

Data extraction was independently performed using a standardized extraction form specifically developed for this review. The extraction process included the following variables:

- Author and year of publication
- Country or geographical setting
- Study design
- Characteristics of the adolescent population
- Type of misinformation evaluated
- Social media platform or digital environment
- Exposure characteristics
- Outcomes assessed
- Principal findings and conclusions

Information regarding validated instruments, structured assessment tools, and outcome measurement frameworks was additionally extracted whenever reported.

Additional variables associated with adolescent developmental dimensions were extracted whenever available, including emotional responses, peer influence dynamics, identity-related processes, psychological vulnerability, digital literacy competencies, critical evaluation skills, online behavioral patterns, and health-related decision-making behaviors.

When studies reported multiple developmental or psychosocial outcomes, all relevant findings associated with adolescent functioning and digital misinformation exposure were extracted and synthesized.

### ***Quality Assessment***

Methodological quality and risk of bias were assessed according to the characteristics of the included study designs using the Joanna Briggs Institute (JBI) critical appraisal tools (Aromataris & Munn, 2020). The JBI framework was selected due to its suitability for evaluating heterogeneous evidence derived from qualitative, observational, cross-sectional, and mixed-methods research commonly identified in misinformation and adolescent social media studies.

Qualitative studies were critically appraised using the JBI Critical Appraisal Checklist for Qualitative Research, whereas analytical cross-sectional, cohort, and other observational studies were evaluated using the corresponding JBI design-specific appraisal instruments. Each study was independently assessed across methodological domains including participant selection, measurement validity, confounding control, data collection procedures, analytical rigor, and coherence between methodology and conclusions.

Disagreements during the appraisal process were resolved through discussion and consensus between reviewers. The methodological quality assessment was considered during the interpretation and narrative synthesis of the findings.

### ***Data Synthesis***

Due to the anticipated methodological and conceptual heterogeneity across study designs, exposure definitions, outcome measurements, and analytical approaches, quantitative meta-analysis was not considered methodologically appropriate. Therefore, findings were synthesized narratively.

The narrative synthesis was conducted with particular emphasis on developmental and psychosocial dimensions associated with adolescence. The synthesis explored how misinformation exposure interacted with developmental processes such as emotional regulation, identity formation, peer influence susceptibility, critical evaluation abilities, digital literacy competencies, and health-related behavioral decision-making within digital ecosystems.

Findings were organized according to recurrent thematic domains identified across the included studies, including:

- Exposure to scientific and health-related misinformation on social media
- Digital literacy and critical evaluation competencies
- Psychosocial and emotional consequences
- Health-related attitudes and behavioral responses
- Artificial intelligence, algorithmic amplification, and emerging digital risks
- Educational and preventive strategies aimed at improving misinformation resilience among adolescents

Thematic coding and narrative categorization were additionally guided by developmental and psychosocial constructs recurrently identified across studies, including peer influence dynamics, emotional vulnerability, identity-related processes, institutional trust, and digital literacy competencies. In addition to the narrative synthesis, descriptive quantitative summaries were generated to characterize study designs, misinformation domains, platform categories, thematic areas, and outcome distributions across the included studies.

### ***Outcome Measures***

The primary outcomes included developmental, psychosocial, behavioral, cognitive, educational, and health-related consequences associated with exposure to misinformation on social media during adolescence. Secondary outcomes included digital literacy competencies, critical evaluation abilities, emotional responses, trust in online information, susceptibility to peer and social influence, risk perception, and patterns of online health-information seeking behavior.

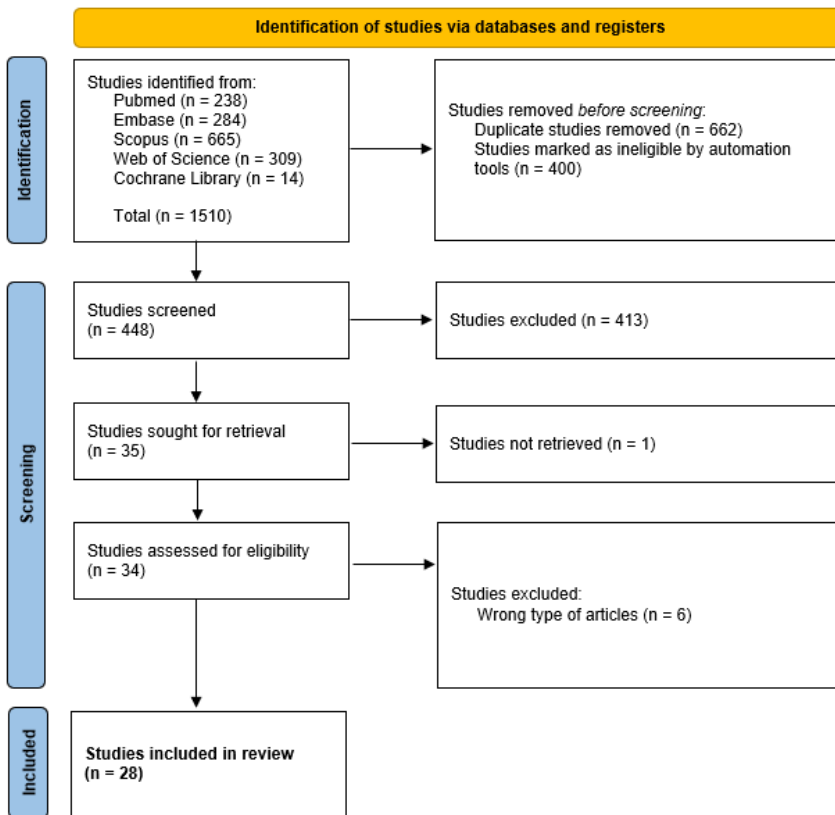
Adolescence was conceptualized not only as an age category but also as a critical developmental stage in which cognitive maturation, psychosocial vulnerability, emotional regulation, and identity construction may influence the interpretation and internalization of misinformation encountered within digital ecosystems.

## **RESULTS**

### ***Study Selection***

The study selection process is presented in Figure 1. A total of 1,510 records were identified through electronic database searches, including PubMed (n = 238), Embase (n = 284), Scopus (n = 665), Web of Science (n = 309), and Cochrane Library (n = 14). Prior to screening, 662 duplicate records were removed and 400 studies were excluded through automation tools, resulting in 448 records eligible for title and abstract screening. Following the screening process, 413 records were excluded, and 35 studies were sought for retrieval. One study could not be retrieved, leaving 34 full-text articles assessed for eligibility. During full-text assessment, six studies (Aboueilla et al., 2022; Guidry & Miller, 2022; Kistin, 2025; Parsa et al., 2025; Sood et al., 2025; Weigle, 2024) were excluded due to inappropriate article type. Ultimately, 28 studies (Baptista et al., 2022; Belova et al., 2022; Bernsteiner et al., 2023; Bowler & Bowler, 2022; Bui et al., 2025; Buller et al., 2022; Dana et al., 2024; Hasanatuludhhiyah et al., 2024; Mou et al., 2026; Oliveira et al., 2025; Paludneviciene et al., 2021; Pérez-Escoda et al., 2025; Pletta et al., 2022; Radwan et al., 2020; Rojas-Bahamon et al., 2024; Sciarretta et al., 2024; Seo et al., 2025; Sestini et

al., 2025; Sialubanjanje et al., 2022; Siani et al., 2025; Siani et al., 2024; Suttor et al., 2023; Takahashi et al., 2025; Taylor-Abdulai et al., 2025; Umerani et al., 2024; Yu et al., 2025; Yurtdas-Depboylu et al., 2022; Zamponi et al., 2024) fulfilled the eligibility criteria and were included in the systematic review (Figure 1).



**Figure 1.**  
*PRISMA flow diagram.*

### ***Characteristics of Included Studies***

The included studies exhibited substantial methodological, geographical, and thematic heterogeneity. Quantitative approaches predominated, particularly cross-sectional survey designs, although mixed-methods, qualitative, and experimental investigations were also identified. The studies were conducted across multiple world regions, including Europe,

North America, Asia, Africa, Oceania, and Latin America, reflecting the global relevance of misinformation exposure in adolescent populations. Detailed characteristics of the included studies are presented in Supplementary File 2.

Most investigations focused on adolescents or secondary school students, although several studies additionally incorporated young adults, university students, preservice teachers, or mixed-age samples when adolescent-related findings were available. Sample sizes varied markedly across studies, ranging from small qualitative cohorts to large-scale survey-based populations.

The misinformation examined across the included studies encompassed scientific misinformation, health misinformation, fake news, vaccine-related misinformation, and COVID-19-related misinformation. Social media platforms represented the principal exposure context in nearly all studies, with investigations assessing either general multi-platform exposure or specific platforms such as TikTok, Instagram, YouTube, Facebook, WhatsApp, and Reddit.

The primary outcomes evaluated included misinformation susceptibility, belief in false information, vaccine hesitancy, digital and media literacy, critical evaluation skills, trust in online information, fact-checking behaviors, emotional responses to misinformation, and online information-seeking practices. Overall, the evidence suggested that greater exposure to social media environments was frequently associated with increased vulnerability to misinformation, whereas higher levels of media literacy, critical thinking, and verification behaviors appeared to reduce susceptibility to misleading scientific and health-related content.

### ***Geographical Distribution and Publication Trends***

The geographical distribution of the included studies demonstrated a predominance of evidence originating from Europe and North America, which together accounted for more than half of the included investigations. Additional contributions were identified from Southeast Asia, East Asia, Sub-Saharan Africa, Oceania, Latin America, and the Middle East and North Africa, indicating that the phenomenon of scientific and health misinformation among adolescents has been investigated across diverse sociocultural and digital contexts. One study additionally involved a transregional context spanning Europe and the Middle East. The geographical distribution of countries represented in the included studies is presented in Figure 2.

Temporal analysis revealed a clear increase in publication activity in recent years. Only isolated studies were identified between 2020 and 2021, whereas a marked growth in scientific production became evident from 2022 onward. The highest publication frequency was observed in 2025, followed by 2022 and 2024. This trend suggested increasing



(DHL) instrument, the WHO SAGE vaccine hesitancy scale, the Social Media Addiction Scale for Adolescents, EAT-26, Body Image Scale, ORTO-11, and multiple structured questionnaires evaluating misinformation susceptibility, conspiracy beliefs, institutional trust, vaccine attitudes, media literacy, digital practices, and health information navigation. Several studies also employed semi-structured interview guides, ethnographic observation protocols, focus group discussion frameworks, and qualitative reflection instruments to explore adolescents' perceptions and experiences related to misinformation exposure in digital environments.

The principal methodological limitations identified across studies were predominantly related to the observational and cross-sectional nature of the evidence, which restricted causal inference. Self-report bias was consistently reported due to reliance on questionnaires and perception-based measures. Several studies additionally presented limited generalizability because of convenience sampling, single-country or single-school contexts, small sample sizes, or highly context-specific populations. Some investigations lacked adolescent-specific data disaggregation, while others employed non-randomized interventions or exploratory qualitative designs with limited transferability. Experimental studies, although methodologically stronger, were frequently conducted under controlled or highly localized educational settings, potentially limiting ecological validity and broader applicability of findings.

The methodological synthesis additionally revealed substantial heterogeneity in recruitment strategies, outcome operationalization, and measurement instruments, highlighting the emerging and multidisciplinary nature of research examining scientific and health misinformation exposure among adolescents in social media environments.

### ***Types of Social Media Platforms Evaluated***

Most included studies evaluated social media exposure using broad multi-platform approaches rather than focusing on a single social networking service. Multi-platform investigations accounted for 85.7% of the included studies (n = 24), generally referring to social media use in generic terms or examining combined exposure to multiple online platforms, digital news environments, or web-based information ecosystems. These studies commonly assessed overall patterns of misinformation exposure, digital literacy, information-seeking behaviors, or trust in online information without isolating the effects of individual platforms.

Only a limited number of investigations specifically focused on defined platform categories. Visual and video-based platforms represented 3.6% of the included studies (n = 1), explicitly evaluating TikTok, Instagram, and YouTube as environments associated with adolescent health information consumption and misinformation exposure. Messaging platforms also accounted for 3.6% (n = 1), with WhatsApp being examined as the primary

communication channel associated with vaccine-related misinformation dissemination and community information exchange.

A small proportion of studies additionally explored emerging or alternative digital contexts. One study investigated educational intervention environments integrating social media-related content through game-based learning strategies, whereas another examined AI-driven and social media-integrated environments, including Reddit and generative artificial intelligence chatbot platforms. These findings reflected the progressive diversification of digital ecosystems through which adolescents encounter, interpret, and disseminate scientific and health-related information online.

Among the explicitly identified platforms, YouTube, Facebook, WhatsApp, TikTok, Instagram, and Reddit were the most frequently reported. However, platform-specific analyses remained relatively uncommon compared with generalized multi-platform approaches. Overall, the evidence suggested that current research predominantly conceptualizes misinformation exposure as a broad digital ecosystem phenomenon rather than as a platform-specific process.

### ***Types of Misinformation Assessed***

The included studies evaluated a broad spectrum of misinformation domains related to health, science, and digital media environments. Scientific misinformation represented the most frequently investigated domain, accounting for 25.0% of the included studies ( $n = 7$ ). These investigations primarily addressed misinformation associated with scientific credibility, pseudoscientific beliefs, conspiracy theories, institutional distrust, and critical evaluation of scientific information. Health misinformation and vaccine misinformation each accounted for 21.4% of the included evidence ( $n = 6$  each), with a strong emphasis on misinformation circulating through social media and digital information ecosystems. Detailed characteristics of misinformation domains and assessed outcomes are presented in Supplementary File 4.

General misinformation represented 10.7% of the included studies ( $n = 3$ ) and commonly focused on fake news exposure, digital disinformation awareness, and media literacy competencies. Less frequently explored domains included social and political misinformation, sexual and reproductive health misinformation, mental health misinformation, AI-related misinformation, body image and nutritional misinformation, and broader sexual and reproductive health misinformation, each representing 3.6% of the included evidence.

Topic-specific analysis demonstrated that COVID-19-related misinformation constituted the most frequently investigated topic across studies ( $n = 11$ ), reflecting the substantial influence of the pandemic on digital misinformation research. Scientific and

pseudoscientific misinformation themes were also highly prevalent ( $n = 8$ ), followed by mental health-related misinformation ( $n = 7$ ) and vaccine-related misinformation ( $n = 6$ ). Sexual and reproductive health-related misinformation accounted for four studies, whereas body image and nutritional misinformation were less frequently investigated ( $n = 2$ ). Only one study specifically evaluated misinformation associated with artificial intelligence and generative AI environments.

The primary outcomes assessed across studies were highly heterogeneous and included misinformation susceptibility, vaccine hesitancy, institutional trust, media literacy, information credibility assessment, emotional distress, anxiety, digital health literacy, conspiracy belief endorsement, health information navigation behaviors, and critical thinking skills. Several studies additionally explored psychosocial outcomes, including mental health, identity formation, body image concerns, stigma, and reproductive health knowledge.

### ***Narrative Synthesis***

The narrative synthesis identified six major thematic domains across the included studies: health misinformation and risk perception, social media exposure and behavioral responses, digital literacy and critical evaluation skills, psychosocial and emotional consequences, AI-related and algorithmic risks, and educational or preventive interventions. Detailed thematic findings are presented in Supplementary File 5.

A consistent finding across studies was that exposure to misinformation through social media environments appeared to influence adolescents' perceptions of health risks, scientific credibility, and decision-making processes. COVID-19-related misinformation, vaccine misinformation, and pseudoscientific content were frequently associated with distorted risk-benefit perceptions, heightened susceptibility to false claims, and reduced trust in scientific or health institutions. Several investigations additionally reported that misinformation contributed to vaccine hesitancy, avoidance of evidence-based health behaviors, and endorsement of conspiracy-related beliefs.

Social media exposure patterns were predominantly characterized by passive information consumption, limited source verification, and reliance on algorithmically curated content. Adolescents frequently used social media platforms as primary information sources despite expressing uncertainty regarding content credibility. Engagement-driven exposure mechanisms, including recommendation systems, social validation metrics, and peer-mediated dissemination, were repeatedly identified as factors reinforcing misinformation vulnerability and shaping behavioral responses.

Deficits in digital literacy and critical evaluation skills emerged as one of the most recurrent themes across the included evidence. Many studies reported limited capacity among

adolescents to distinguish evidence-based information from misleading or pseudoscientific content. Fact-checking behaviors were infrequently observed, whereas credibility judgments were commonly influenced by peer endorsement, popularity indicators, emotional framing, or source familiarity rather than scientific validity. Several investigations additionally highlighted substantial variability in digital health literacy and misinformation resilience according to educational context and sociodemographic characteristics.

Psychosocial and emotional consequences constituted another prominent thematic domain. Exposure to misinformation was associated with anxiety, panic, uncertainty, fear, identity distress, body image dissatisfaction, stigma, and reduced institutional trust. Studies examining body image, reproductive health, LGBTQ+ misinformation, and mental health misinformation particularly emphasized the psychological burden associated with prolonged exposure to misleading social media content. In some investigations, misinformation exposure was linked to emotional vulnerability, social withdrawal, and maladaptive health-related behaviors.

Emerging digital risks associated with algorithmic amplification and generative artificial intelligence were identified in a smaller but increasingly relevant subset of studies. Algorithmically curated content was described as reinforcing misinformation exposure by prioritizing engagement-driven material, while one study specifically identified adolescents' limited ability to distinguish AI-generated misinformation from authentic information. These findings suggested that evolving AI-driven digital ecosystems may introduce new vulnerabilities related to misinformation dissemination and credibility assessment.

Educational and preventive interventions consistently demonstrated beneficial effects across the included studies. Media literacy programs, digital health literacy interventions, science education initiatives, gamified educational strategies, and structured school-based curricula frequently improved adolescents' critical evaluation abilities, misinformation awareness, and evidence-based decision-making capacities. Interventions focusing on vaccine literacy, scientific reasoning, and responsible digital practices additionally appeared to reduce misinformation susceptibility and strengthen resilience against misleading online information. Overall, the narrative synthesis suggested that educationally oriented and literacy-based approaches represent the most promising strategies currently available for mitigating the impact of misinformation exposure among adolescents in digital environments.

### ***Methodological Quality of Included Studies***

The methodological quality assessment demonstrated that most included studies presented moderate-to-high methodological rigor according to the Joanna Briggs Institute (JBI) critical appraisal criteria (Figure 3). Overall JBI scores ranged from 75.0% to 100.0%,

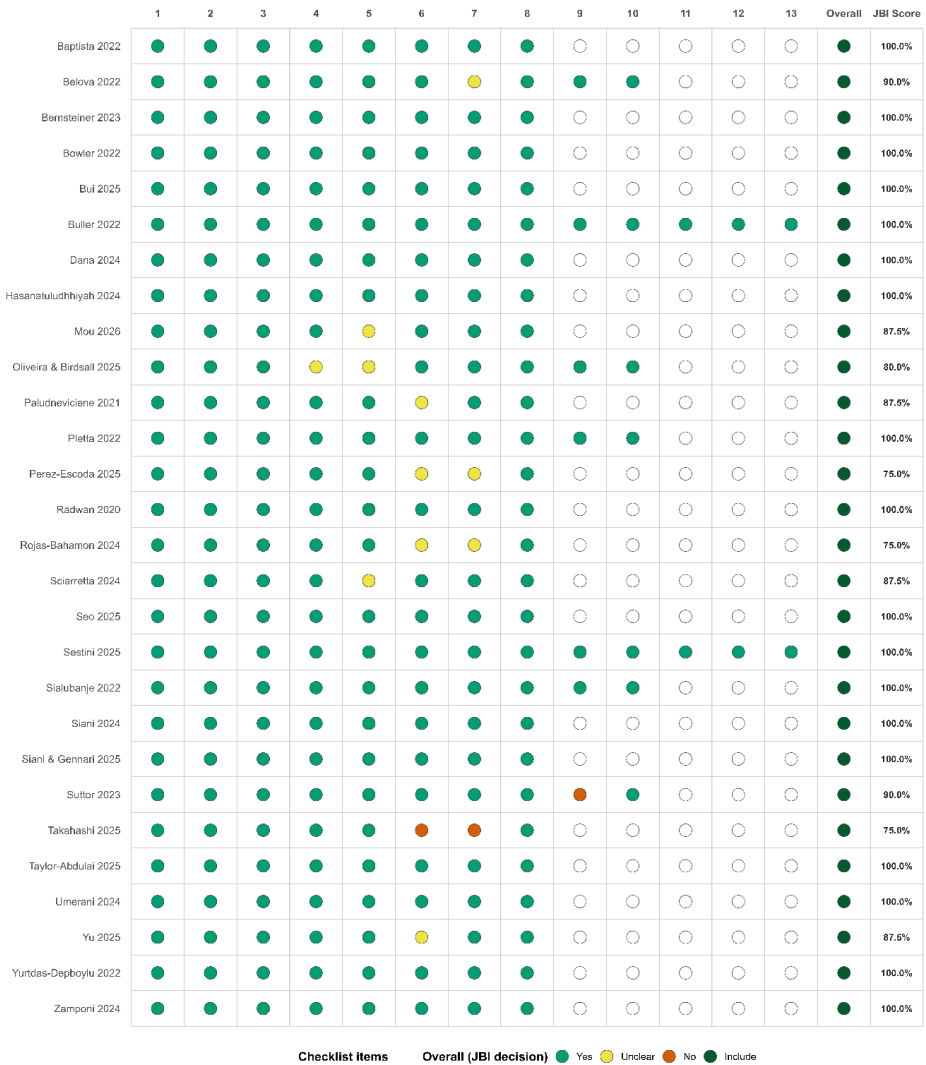
with the majority of studies achieving scores  $\geq 87.5\%$ , indicating generally satisfactory methodological quality across the evidence base.

The appraisal process incorporated different JBI critical appraisal tools according to study design. The Checklist for Analytical Cross-Sectional Studies was the most frequently applied instrument ( $n = 14$ ), followed by the Checklist for Mixed-Methods Studies ( $n = 7$ ), the Checklist for Qualitative Research ( $n = 5$ ), and the Checklist for Randomized Controlled Trials ( $n = 2$ ). This distribution reflected the predominance of observational and mixed-methods research within the included evidence base.

Several studies fulfilled all applicable appraisal criteria and achieved the maximum methodological score of 100.0%, particularly among quantitative cross-sectional investigations and some experimental studies. A smaller subset of studies demonstrated lower scores, mainly due to unclear reporting of methodological procedures, limited information regarding confounding control, incomplete description of recruitment strategies, or insufficient detail concerning validity and reliability assessment procedures.

The most recurrent methodological concerns were associated with uncertainty in the identification or management of confounding variables, limited clarity regarding exposure measurement consistency, and insufficient reporting of strategies to minimize bias in observational designs. Qualitative and mixed-methods studies occasionally demonstrated unclear methodological alignment between data collection procedures and analytical interpretation, whereas some educational intervention studies lacked detailed reporting of randomization or standardization procedures.

Despite these limitations, no study was excluded on the basis of methodological quality. Overall, the appraisal findings suggested that the included evidence provided an acceptable methodological foundation for the narrative synthesis while highlighting the need for more robust longitudinal, multicenter, and methodologically standardized investigations addressing adolescent exposure to scientific and health misinformation in digital environments.



**Figure 3.**  
*Methodological quality assessment of the included studies according to the Joanna Briggs Institute (JBI) critical appraisal tools.*

## **OUTCOMES ASSOCIATED WITH EXPOSURE TO SOCIAL MEDIA MISINFORMATION DURING ADOLESCENCE**

### ***Primary Outcomes***

The primary outcomes identified across the included studies comprised developmental, psychosocial, behavioral, cognitive, educational, and health-related consequences associated with exposure to misinformation on social media during adolescence. Overall, the evidence demonstrated that misinformation exposure was consistently associated with multidimensional psychosocial, behavioral, and cognitive outcomes on adolescent development, particularly within psychosocial, behavioral, and cognitive domains.

Psychosocial consequences represented one of the most consistently documented outcome categories. Across the included studies, exposure to misinformation was associated with anxiety, fear, panic, depressive symptomatology, identity-related distress, emotional confusion, institutional distrust, and emotional dependence on digital environments. COVID-19-related misinformation circulating through platforms such as Facebook, WhatsApp, YouTube, TikTok, and Instagram was repeatedly associated with heightened psychological distress, uncertainty, and fear among adolescents and school-aged populations. Additionally, discriminatory and identity-invalidating misinformation targeting transgender and non-binary adolescents was linked to compromised emotional wellbeing and impaired family functioning. Emerging evidence also identified emotional dependence on generative artificial intelligence platforms as a novel psychosocial vulnerability associated with misinformation exposure.

Behavioral consequences were predominantly reflected in vaccine hesitancy, misinformation-sharing behaviors, avoidance practices, non-evidence-based health behaviors, discriminatory conduct, and maladaptive eating-related behaviors. Vaccine-related misinformation represented the most frequently reported behavioral manifestation, particularly in relation to COVID-19 and HPV vaccination. Several studies documented that misinformation disseminated through social media platforms was associated with increased vaccine hesitancy and reduced vaccination intentions and hesitancy among adolescents, younger adults, and community populations. Other studies identified associations between misinformation exposure and the adoption of unsafe or non-evidence-based health practices, as well as discriminatory behaviors toward individuals living with HIV/AIDS. Social media addiction and misinformation exposure were additionally associated with orthorexic tendencies and disordered eating behaviors among adolescents.

Cognitive outcomes were characterized by reduced critical appraisal abilities, increased susceptibility to misinformation, pseudoscientific belief endorsement, conspiracy-oriented thinking, poor source reliability assessment, and limited fact-checking practices. Multiple studies demonstrated that adolescents frequently relied on informal or socially mediated

credibility heuristics rather than evidence-based verification strategies when evaluating online information. Scientific and health misinformation were often accepted without systematic verification, particularly among adolescents with higher levels of social media engagement. Several studies also identified substantial difficulties in distinguishing scientific information from pseudoscientific or misleading content, particularly in contexts involving COVID-19, quantum pseudoscience, and AI-generated misinformation. Furthermore, adolescents demonstrated limited evaluative capacity when interacting with generative AI platforms, highlighting an emerging AI literacy deficit.

Educational and health-related outcomes were also recurrently reported. Exposure to misinformation was associated with confusion regarding scientific and public health concepts, distorted understanding of health risks, and impaired health-information decision-making. Inadequate menstrual health knowledge, misconceptions related to infectious diseases, and confusion regarding vaccine safety and efficacy were frequently identified among adolescent populations exposed to inaccurate social media content. Collectively, these findings suggested that persistent exposure to misinformation may interfere with adolescent health literacy development and evidence-based decision-making processes.

### ***Secondary Outcomes***

Secondary outcomes included digital literacy competencies, critical evaluation abilities, emotional responses, trust in online information, susceptibility to peer and social influence, risk perception, and patterns of online health-information seeking behavior. These secondary outcomes frequently functioned as mediating or moderating factors influencing adolescents' vulnerability to misinformation exposure.

Digital literacy deficits emerged as a transversal finding across the included studies. Adolescents frequently demonstrated limited information verification practices, inadequate fact-checking behaviors, low digital health literacy, and poor evaluative capacity regarding the epistemic quality of online content. Information assessment was commonly guided by socially mediated heuristics, peer validation, or platform familiarity rather than systematic verification strategies. Several studies identified substantial heterogeneity in digital health literacy competencies according to gender, educational level, and preferred social media platforms. Moreover, the increasing dissemination of AI-generated content introduced a novel dimension of digital vulnerability, with adolescents demonstrating limited capacity to identify or critically evaluate AI-generated misinformation.

Emotional responses constituted another prominent secondary outcome. Fear, confusion, hopelessness, uncertainty, shame, panic, anxiety, and emotional distress were recurrently reported among adolescents exposed to misinformation-related digital environments. Misinformation associated with public health emergencies, identity-related stigma, and

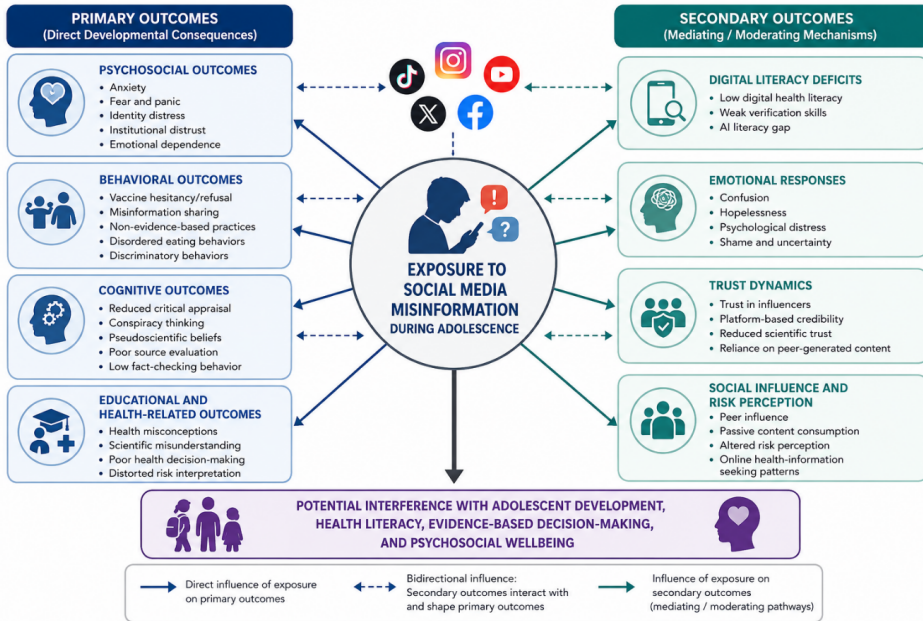
reproductive health topics appeared to generate particularly strong emotional responses. Several studies further suggested that emotionally charged misinformation spread more rapidly and exerted greater psychological influence than accurate information.

Trust in online information represented an additional recurring secondary outcome. Adolescents frequently relied on social engagement indicators such as likes, follower counts, influencer popularity, and peer-generated content as proxies for credibility when evaluating health and scientific information online. Exposure to misinformation was also associated with diminished trust in healthcare systems, scientific institutions, educational authorities, and governmental agencies. Conversely, trust in healthcare professionals and evidence-based institutional communication appeared to function as protective factors against misinformation susceptibility.

Susceptibility to peer and social influence was frequently identified as an important mechanism underlying misinformation exposure and dissemination. Peer-generated narratives, influencer content, and socially amplified misinformation frequently shaped adolescents' perceptions regarding vaccines, health behaviors, body image, and scientific topics. Passive digital consumption patterns and socially reinforced misinformation-sharing behaviors were commonly reported across adolescent populations.

Risk perception and online health-information seeking behaviors were also recurrently influenced by misinformation exposure. Adolescents frequently reported difficulties in evaluating the reliability and safety of online health information, particularly during the COVID-19 pandemic and in relation to sexual and reproductive health topics. In several studies, social media platforms constituted the primary source of health information despite simultaneously being perceived as unreliable or confusing environments. These findings collectively suggested that misinformation exposure may substantially shape adolescents' health-information navigation patterns, risk interpretation processes, and preventive health behaviors.

A conceptual synthesis summarizing the relationships between exposure to social media misinformation during adolescence and the reported primary and secondary outcomes identified across the included studies is presented in Figure 4.



**Figure 4.**  
*Conceptual Synthesis of Primary and Secondary Outcomes Associated with Social Media Misinformation Exposure During Adolescence*

## DISCUSSION

### *Principal Findings*

The present systematic review synthesized evidence regarding the influence of scientific and health-related misinformation disseminated through social media on adolescent development and health-related outcomes. Overall, the findings suggested that misinformation exposure represented a multidimensional developmental and public health concern associated with psychosocial distress, maladaptive behavioral responses, reduced critical appraisal abilities, institutional distrust, and impaired health-information decision-making among adolescents. The evidence additionally indicated that digital literacy competencies, educational interventions, and structured critical evaluation strategies may function as protective factors mitigating misinformation susceptibility.

A major finding of the review was the consistent association between misinformation exposure and adverse psychosocial consequences. Adolescents exposed to misleading

or contradictory digital content frequently experienced anxiety, fear, uncertainty, confusion, panic, and emotional distress, particularly in relation to COVID-19-related misinformation, body image narratives, reproductive health content, and identity-related misinformation. These findings are particularly relevant considering that adolescence constitutes a developmental stage characterized by ongoing emotional regulation, identity formation, social comparison processes, and heightened sensitivity to peer influence. Consequently, exposure to emotionally charged misinformation within highly interactive digital environments may amplify developmental vulnerabilities and negatively influence psychosocial wellbeing.

Behavioral consequences additionally emerged as a recurrent theme across the included evidence. Vaccine hesitancy represented one of the most consistently documented outcomes, particularly regarding COVID-19 and HPV vaccination. Exposure to misinformation was also associated with misinformation-sharing behaviors, avoidance of evidence-based healthcare practices, stigmatizing attitudes, and maladaptive eating-related behaviors. These findings suggested that misinformation exposure may extend beyond cognitive misunderstanding and directly influence real-world health-related decision-making and behavioral practices among adolescents.

The review further demonstrated that adolescents frequently exhibited limited critical appraisal abilities and insufficient digital health literacy competencies when navigating online information ecosystems. Credibility judgments were commonly influenced by peer endorsement, influencer popularity, emotional framing, and social validation metrics rather than scientific reliability or evidence quality. This pattern appeared particularly relevant within algorithmically curated social media environments, where emotionally engaging and highly shareable misinformation may achieve greater visibility than evidence-based information. The findings therefore reinforced concerns that current social media architectures may unintentionally facilitate misinformation dissemination among developmentally vulnerable populations.

### ***Interpretation Within the Context of Adolescent Development***

The findings of the present review may be interpreted within broader developmental and psychosocial frameworks associated with adolescence. Adolescents commonly demonstrate increasing autonomy in information seeking while simultaneously undergoing cognitive maturation processes that may not yet fully support advanced evaluative reasoning, source verification, and resistance to persuasive digital influence. The observed susceptibility to misinformation may therefore reflect the interaction between developmental characteristics and highly persuasive algorithm-driven digital ecosystems (Feijoo et al., 2023; Ma et al., 2026; Wang et al., 2025).

Identity formation processes additionally appeared highly relevant within the reviewed evidence. Several studies demonstrated that misinformation related to body image, sexuality, reproductive health, gender identity, and mental health may exert substantial influence on adolescents' self-perception and psychosocial functioning (Plettra et al., 2022; Rojas-Bahamon et al., 2024; Seo et al., 2025; Suttor et al., 2023; Waldmann et al., 2025; Yurtdas-Depboylu et al., 2022; Zamponi et al., 2024). Social media environments characterized by continuous social comparison, influencer culture, and appearance-centered communication may further intensify vulnerability to misleading or harmful narratives. These findings supported the conceptualization of misinformation not merely as a communication problem but also as a developmental determinant capable of influencing emotional wellbeing, identity construction, and social integration (Ma et al., 2026; Rojas-Bahamon et al., 2024; Wang, 2024).

Peer influence dynamics represented another important mechanism identified across studies. Adolescents frequently relied on socially mediated credibility heuristics, including likes, shares, follower counts, and peer-generated content, when evaluating information reliability (Baptista et al., 2022; Feijoo et al., 2023; Seo et al., 2025). Such findings aligned with developmental theories emphasizing the growing importance of peer validation during adolescence (Ma et al., 2026; Wang, 2024). Consequently, misinformation dissemination within adolescent digital environments may become socially reinforced through mechanisms of belonging, conformity, and social acceptance (Feijoo et al., 2023; Seo et al., 2025; Wang et al., 2025).

### ***Digital Literacy, Algorithmic Amplification, and Emerging AI Risks***

Digital literacy deficits emerged as one of the most consistent findings across the included studies. Many adolescents demonstrated inadequate fact-checking practices, poor source reliability assessment, and limited evaluative capacity regarding scientific and health-related information (Baptista et al., 2022; Belova et al., 2022; Bernsteiner et al., 2023; Hasanatuludhhiyah et al., 2024; Pérez-Escoda et al., 2025; Siani et al., 2025; Siani et al., 2024). Importantly, the findings suggested that digital exposure alone did not translate into digital competence. Although adolescents frequently engaged with online information ecosystems, they often lacked structured educational preparation to critically interpret complex or misleading digital content (Baptista et al., 2022; Belova et al., 2022; Hasanatuludhhiyah et al., 2024; Pérez-Escoda et al., 2025).

The review additionally highlighted the increasing relevance of algorithmic amplification and generative artificial intelligence within contemporary misinformation ecosystems (Ma et al., 2026; Wang, 2024; Yu et al., 2025). Algorithmically curated content was repeatedly described as reinforcing exposure to emotionally engaging misinformation through recommendation systems and engagement-oriented dissemination patterns. Furthermore, emerging evidence indicated that adolescents frequently experienced difficulty distinguishing

AI-generated misinformation from authentic content. These findings suggested that future misinformation challenges may become increasingly complex as generative AI systems produce more sophisticated and persuasive synthetic content (Ma et al., 2026; Yu et al., 2025).

The incorporation of AI-related misinformation within adolescent digital ecosystems represented a particularly important emerging concern identified by the review. Although only a limited number of studies directly evaluated AI-generated misinformation, the available evidence suggested substantial vulnerabilities related to AI literacy, authenticity assessment, and emotional dependence on AI-mediated communication environments. These findings highlighted the urgent need for future research specifically addressing adolescent interaction with generative AI systems and AI-driven misinformation exposure (Ma et al., 2026; Yu et al., 2025).

### ***Educational and Public Health Implications***

The findings of the present review suggested that educationally oriented interventions may represent one of the most promising strategies for mitigating misinformation vulnerability among adolescents (Bernsteiner et al., 2023; Maturo & Gaiha, 2025; Oliveira et al., 2025; Pérez-Escoda et al., 2025; Umerani et al., 2024; Wang et al., 2025). Media literacy initiatives, digital health literacy programs, school-based educational interventions, gamified learning strategies, and critical thinking curricula consistently demonstrated beneficial effects across the included studies. Such interventions frequently improved misinformation awareness, fact-checking behaviors, scientific reasoning, and evidence-based decision-making capacities (Bernsteiner et al., 2023; Oliveira et al., 2025; Pérez-Escoda et al., 2025; Wang et al., 2025).

Importantly, the evidence suggested that effective misinformation prevention strategies should be developmentally adapted and contextually sensitive (Ma et al., 2026; Wang, 2024; Wang et al., 2025). Educational interventions designed for adolescents may require consideration of peer influence dynamics, emotional engagement patterns, platform-specific behaviors, and evolving digital communication practices (Feijoo et al., 2023; Ma et al., 2026; Wang, 2024; Wang et al., 2025). Interventions focused solely on factual correction may be insufficient if psychosocial and emotional dimensions underlying misinformation engagement are not simultaneously addressed (Ma et al., 2026; Wang, 2024; Wang et al., 2025).

From a public health perspective, the findings highlighted the importance of strengthening institutional trust and promoting accessible evidence-based communication targeting adolescent populations (Bui et al., 2025; Buller et al., 2022; Sestini et al., 2025; Sialubanje et al., 2022; Takahashi et al., 2025; Taylor-Abdulai et al., 2025). Adolescents frequently reported uncertainty regarding the reliability of online health information despite relying heavily on social media platforms as primary information sources (Bowler & Bowler, 2022; Seo et al., 2025; Suttor et al., 2023; Zamponi et al., 2024). Strengthening

collaboration between educational systems, healthcare institutions, families, and digital platforms may therefore be necessary to promote safer digital information ecosystems for adolescents (Feijoo et al., 2023; Ma et al., 2026; Wang, 2024).

### ***Strengths and Limitations***

The present review demonstrated several strengths. A comprehensive search strategy was conducted across multiple databases, and the review incorporated heterogeneous evidence derived from quantitative, qualitative, mixed-methods, and experimental investigations. The synthesis additionally adopted a developmental perspective emphasizing psychosocial, cognitive, emotional, and behavioral dimensions associated with adolescence, thereby providing a broader understanding of misinformation-related vulnerabilities beyond isolated health behaviors.

Nevertheless, several limitations should be acknowledged. First, substantial methodological heterogeneity across study designs, misinformation domains, exposure definitions, and outcome measures precluded quantitative meta-analysis and limited direct comparability between studies. Second, most included investigations employed cross-sectional observational designs, thereby restricting causal inference regarding the relationship between misinformation exposure and developmental outcomes. Third, self-report measures predominated across studies and may have introduced recall bias, social desirability bias, or subjective interpretation variability.

Additional limitations included convenience sampling, limited geographical representativeness in some studies, and inconsistent operationalization of misinformation-related constructs. Platform-specific analyses were relatively uncommon, limiting the ability to determine whether particular social media architectures differentially influence misinformation vulnerability. Furthermore, evidence regarding AI-generated misinformation remained scarce despite the increasing relevance of generative artificial intelligence within adolescent digital ecosystems.

### ***Future Research Directions***

Future investigations should prioritize longitudinal and prospective designs capable of clarifying causal relationships between misinformation exposure and adolescent developmental outcomes. Greater methodological standardization regarding misinformation definitions, exposure characterization, and outcome operationalization would additionally improve comparability across studies.

Research specifically evaluating platform-specific mechanisms, algorithmic amplification processes, and generative AI-related misinformation exposure among

adolescents remains urgently needed. Future studies should additionally explore protective factors associated with misinformation resilience, including family communication patterns, institutional trust, educational context, emotional regulation competencies, and advanced digital literacy skills.

Intervention research should further investigate the long-term effectiveness of educational, behavioral, and platform-level strategies aimed at reducing misinformation susceptibility among adolescents. Developmentally tailored interventions integrating emotional, psychosocial, and cognitive dimensions may represent particularly promising approaches for future implementation and evaluation.

## CONCLUSIONS

Scientific and health-related misinformation disseminated through social media environments appeared to exert substantial psychosocial, behavioral, cognitive, educational, and health-related effects on adolescent populations. Exposure to misinformation was consistently associated with anxiety, institutional distrust, vaccine hesitancy, impaired critical appraisal abilities, maladaptive health behaviors, and reduced confidence in evidence-based information.

Digital literacy deficits, peer-mediated credibility heuristics, emotionally valenced communication, and algorithmic amplification emerged as central mechanisms contributing to adolescent vulnerability to misinformation exposure. Emerging evidence additionally suggested that generative artificial intelligence and AI-driven digital ecosystems may introduce new risks associated with authenticity assessment and misinformation dissemination.

Educationally oriented interventions, media literacy programs, and digital health literacy initiatives consistently demonstrated beneficial effects and currently represent the most promising evidence-based strategies for strengthening misinformation resilience among adolescents. Future research should prioritize longitudinal, multicenter, and methodologically standardized investigations capable of clarifying causal pathways and evaluating interventions adapted to rapidly evolving digital environments.

### ***Conflict of interest***

The authors declare that they have no known competing financial interests, personal relationships, institutional affiliations, or non-financial conflicts that could have appeared to influence the work reported in this manuscript.

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