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Technology-Supported Visual-Social Media for Body Boundary Education among Children with Intellectual Disabilities: A Systematic Literature Review

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Abstract: Children with intellectual disabilities are a vulnerable group at risk of body boundary violations and sexual violence due to limitations in cognitive functioning, social understanding, and self-protection abilities. Therefore, adaptive and contextual body boundary education has become an urgent need in special education. This study aims to systematically examine the use of technology-supported visual-social media in body boundary and self-safety education for children with intellectual disabilities. A Systematic Literature Review (SLR) approach was employed, following PRISMA guidelines and complemented by bibliometric analysis to map publication trends and research characteristics. A literature search in the Scopus database identified 554 articles in the initial stage; 10 studies were selected for qualitative synthesis using inclusion and exclusion criteria. The findings indicate that visual and technology-supported approaches, including social-scenario videos, visual simulations, and interactive media, have the potential to enhance knowledge, protective attitudes, and body-safety skills among children with intellectual disabilities. However, the evidence varies across studies in terms of intervention types, research design, and methodological quality. Several included studies also do not exclusively focus on technology-based interventions, indicating the need for cautious interpretation. Overall, technology-supported visual-social media demonstrates promising potential as a supportive approach for body safety education, although current evidence remains limited and heterogeneous. Future research with more rigorous experimental designs, consistent outcome measures, and clearly defined intervention frameworks is needed to strengthen evidence-based practices in this field.

Keywords: intellectual disability; body safety; visual-social media; educational technology; systematic literature review.

INTRODUCTION

Children with intellectual disabilities are individuals with special needs characterized by limitations in intellectual functioning and adaptive abilities that significantly affect the conceptual, social, and practical aspects of daily life (Patel et al., 2020; Batsou, 2021). These limitations not only affect academic abilities but also impact social understanding, decision-making, and the ability to protect oneself in potentially dangerous situations (Ahmad et al., 2025). In this context, the issues of body safety and self-protection become crucial aspects of development, yet they often receive insufficient attention in special education practices (Hartwig & McMullen, 2021; Yektaoğlu, 2021).

Various reports and empirical studies indicate that children with intellectual disabilities are at a higher risk of experiencing sexual violence compared to children without disabilities (Tomsa et al., 2021; Fang et al., 2022). This vulnerability is influenced by several factors, including limited understanding of social norms, difficulty distinguishing between appropriate and inappropriate behavior, dependence on adults, and limited ability to communicate unsafe experiences (Hansson et al., 2020; Fatimatuzzahra et al., 2022). Additionally, social stigma and low expectations regarding the abilities of children with intellectual disabilities often lead to sexual education and self-protection being considered sensitive topics to be avoided, thus widening the protection gap that children should receive (Thomas et al., 2016; Belluzzo et al., 2025).

Body boundary education or body safety education is seen as an essential preventive approach in efforts to protect children with intellectual disabilities from sexual violence (Kucuk et al., 2017; Bright et al., 2025). This education includes introducing private body parts, understanding safe and unsafe touch, the ability to say "no," and the skills to report boundary-violating incidents to trusted adults (Bernier & America, 2015). However, implementing body boundary education for children with intellectual disabilities poses complex pedagogical challenges (Practices, 2024). Abstract, verbal, and normative learning approaches often do not align with children's learning characteristics, which require concrete, visual, contextual, and repetitive stimuli (Duthois & Van Oss, 2025).

With advances in educational technology, technology-supported visual-social media has emerged as a potentially adaptive approach in special education contexts (Alam, 2022; Bircanin, 2022). In this study, visual-social media is specifically defined as technology-assisted instructional media that combine visual representations with socially contextualized scenarios, such as video-based social stories, digital simulations, and interactive visual applications (Parai et al., 2015; Budiarto, 2020). These media emphasize observational learning, contextual understanding, and behavioral modeling, which are particularly relevant for children with intellectual disabilities (Bouck et al., 2017; Algahtani, 2017).

This conceptual clarification is important, as previous studies have used the terms “visual” or “technology-based interventions” in a broad, inconsistent manner, often encompassing non-digital or non-interactive approaches (Hernández-Capistrán et al., 2024). As a result, there is limited clarity regarding which types of interventions are most effective and how they contribute to body boundary education outcomes (Dapor et al., 2023; Buhdi et al., 2020).

Existing studies suggest that visual and technology-supported approaches may contribute to improving knowledge, protective attitudes, and body safety skills (Klavina et al., 2024; Angreni et al., 2023). However, the evidence remains fragmented, with considerable variation in intervention types, research designs, duration, and outcome measures. Furthermore, several studies focus on general educational or preventive strategies without explicitly integrating technology-based visual-social media as a core component of the intervention.

In addition to these variations, methodological limitations are also evident in the literature (Effendi et al., 2025). Many studies employ small sample sizes, use pre-experimental designs, or lack long-term follow-up. Moreover, there is currently no widely accepted conceptual framework that systematically links technology-supported visual-social media with body boundary education for children with intellectual disabilities. These limitations pose challenges for both researchers and practitioners in identifying evidence-based, contextually appropriate interventions.

Based on these gaps, a more critical and systematic synthesis of the literature is needed. A Systematic Literature Review (SLR) is an appropriate approach for mapping research trends, examining intervention characteristics, and identifying inconsistencies and research gaps in this field.

Therefore, this study aims to systematically review the use of technology-supported visual-social media in body boundary education for children with intellectual disabilities. Specifically, this study seeks to (1) identify the types of visual-social media used, (2) examine reported learning outcomes, (3) analyze the extent to which these interventions demonstrate potential effectiveness, and (4) identify methodological limitations and directions for future research. This study is expected to contribute to the development of a

more structured conceptual understanding and to provide practical implications for designing adaptive, evidence-informed educational interventions.

METHOD

Research Design

This study uses a Systematic Literature Review (SLR) approach to systematically identify, evaluate, and synthesize research findings related to the use of technology-based visual-social media in body boundary/body safety education for children with intellectual disabilities (Andreini & Bettinelli, 2017). The SLR process was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure transparency, replicability, and methodological rigor in the literature selection process (Parums, 2021).

Additionally, this study integrates bibliometric analysis to map the characteristics of publications, research trends, and study foci within the research field. The bibliometric approach is used as a complement to the SLR to provide a quantitative overview of the research landscape, while also strengthening the descriptive and interpretive analysis of the literature findings.

To enhance methodological rigor, this review follows established SLR procedures, including a structured search strategy, predefined inclusion and exclusion criteria, and systematic data extraction. Although this study focuses on a single primary database (Scopus), this approach was chosen to ensure the inclusion of high-quality, peer-reviewed international publications. However, this may limit the review's comprehensiveness and should be taken into account when interpreting the findings.

Data Sources and Search Strategies

The primary data source for this research was the Scopus database, selected for its reputation as one of the largest and most reputable bibliographic databases for international scientific publications. The literature search was conducted systematically using a combination of keywords relevant to the research focus. Search keywords are compiled considering three main constructs, namely:

1. Population: children with intellectual disabilities, intellectual disability, intellectual developmental disorder
2. Intervention: visual-social media, technology-supported learning, visual media, digital learning
3. Context/Topic: body boundary education, body safety, sexual abuse prevention

This combination of keywords is used with Boolean operators (AND, OR) to filter for the most relevant articles. The search process yielded 554 articles at the initial identification stage.

Inclusion and Exclusion Criteria

To ensure the relevance and quality of the analyzed literature, this study establishes the following inclusion and exclusion criteria:

Inclusion criteria:

1. Empirical research articles or systematic reviews discussing body boundaries education or body safety.
2. The research subjects are children with intellectual disabilities or individuals with intellectual developmental disorders.
3. Studies involving the use of visual media, visual social media, or learning support technologies.

4. The article is published in a reputable scientific journal and is indexed in Scopus.
5. The article is available in full text.

Exclusion criteria:

1. Articles that are solely editorials, opinions, or non-empirical reports.
2. Studies that do not explicitly address body boundaries education or self-safety.
3. Research whose subjects are not children or do not include intellectual disabilities.
4. Articles with low methodological quality or unclear methodological information.

To maintain consistency of evidence, this review prioritizes empirical studies that explicitly report intervention processes and outcomes. However, studies with diverse research designs (e.g., systematic reviews, experimental, and qualitative studies) were included to provide a broader understanding of the research landscape. This heterogeneity is acknowledged as a limitation in interpreting the overall findings.

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

The literature selection process followed the PRISMA stages: identification, screening, eligibility assessment, and final inclusion. From the 554 initially identified articles, duplicates were removed, leaving 497. Subsequently, titles and abstracts were screened to assess topic relevance to the research focus, resulting in 96 articles for full-text assessment.

At the full-text eligibility stage, articles are evaluated based on established inclusion and exclusion criteria. A total of 86 articles were eliminated because they did not meet the methodological criteria or were not substantively relevant. Finally, a total of 10 articles were identified as meeting the criteria and were included in the qualitative synthesis.

Data Analysis

Data analysis in this study was conducted through two main approaches: qualitative synthesis analysis and bibliometric analysis. Qualitative Synthesis Based on Research Questions: The selected articles were analyzed in depth to address the four research questions (RQ1–RQ4). This analysis included:

1. Identify the types of technology-based social visual media used.
2. Analysis of learning outcomes and intervention achievements.
3. Evaluate the effectiveness of the intervention based on the research design and findings.

Quality Appraisal of Included Studies

To assess the methodological quality of the included studies, a simplified critical appraisal approach was applied. Each study was evaluated against key criteria, including research design clarity, sample adequacy, the description of intervention procedures, and the reporting of outcomes.

Given the diversity of study designs, a formal risk-of-bias tool was not applied consistently across studies. Instead, a descriptive quality assessment was conducted to identify potential methodological strengths and limitations across studies. The results of this appraisal were used to support cautious interpretation of findings rather than to exclude studies from the synthesis.

Bibliometric Analysis

Bibliometric analysis was conducted to map publication characteristics, including:

1. Year of publication and research trends.
2. The dominant type of research design.
3. Focus on the themes and intervention approaches frequently used.

Bibliometric data were analyzed descriptively to provide a quantitative overview of the development of technology-based visual-social media studies in children's body safety education with intellectual disabilities.

Validity and Reliability of the Review Process

To enhance the validity and reliability of the review process, all stages of article selection and analysis were conducted systematically in accordance with PRISMA guidelines. The screening and selection process was conducted carefully, using predefined criteria to minimize selection bias.

Although the research team conducted the review process, the use of clear procedural steps and transparent reporting aimed to ensure consistency and reproducibility. However, the absence of multiple independent reviewers may introduce potential bias, which should be considered when interpreting the results.

FINDING AND DISCUSSION

Finding(s)

This section presents the study's findings using two complementary analytical approaches. First, a bibliometric analysis provides a general overview of research trends, publication characteristics, and thematic developments in body safety education for children with intellectual disabilities. Second, a qualitative synthesis of the selected studies is conducted to examine the characteristics of interventions, reported outcomes, and methodological patterns. These two approaches are presented sequentially to provide both a macro-level and micro-level understanding of the research landscape.

Overview of Publications Based on Bibliometric Analysis

Figure 1. Overview of Publications Based

A bibliometric analysis was conducted on 554 documents identified from the Scopus database, with a publication timeframe of 2016–2026. Overall, the publications originated from 260 journal sources, involving 1,681 authors, with an average of 3.49 authors per article. The percentage of international collaboration was recorded at 17.15%, indicating that research related to body safety education and the prevention of sexual violence among children with intellectual disabilities has attracted cross-border attention. However, the level of collaboration remains moderate.

The average age of the documents is 4.6 years, with an average citation rate of 13.23 per article, suggesting that this field has notable scientific relevance. However, the annual publication growth rate is -15.56%, indicating fluctuations and a recent decline in publication trends.

Annual Scientific Production Trend

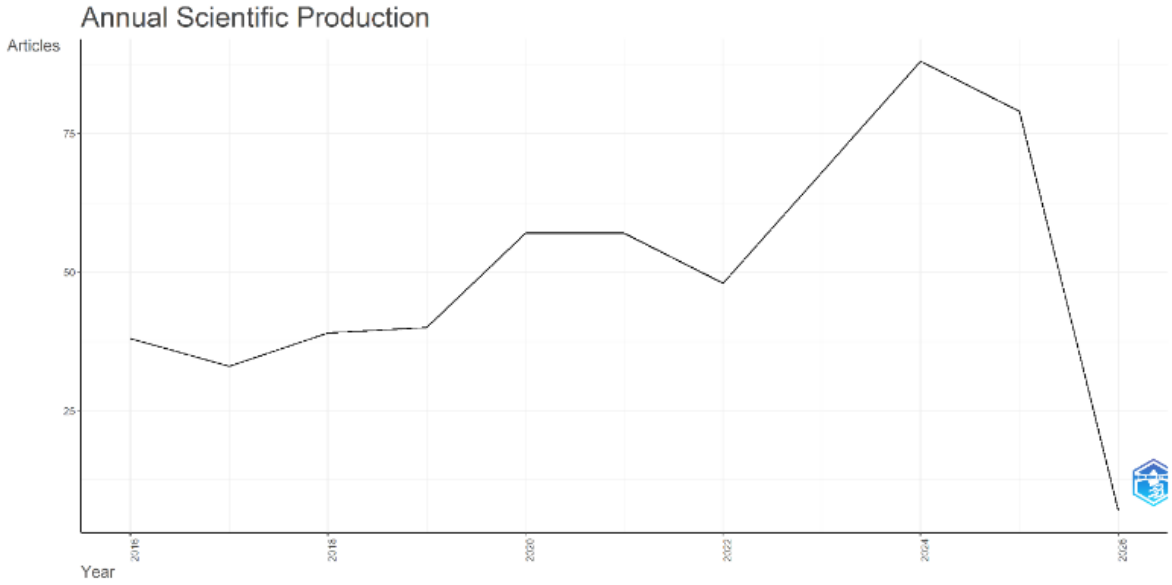

Figure 2. Annual Scientific Production

The annual scientific production has shown a gradual increase since 2016, peaking around 2024. After this peak, the number of publications declined in the most recent year. This pattern suggests that research on body safety education and the prevention of sexual violence among children with intellectual disabilities may be influenced by shifting research priorities, funding availability, and global agendas.

Thematic Maps and Keyword Networks

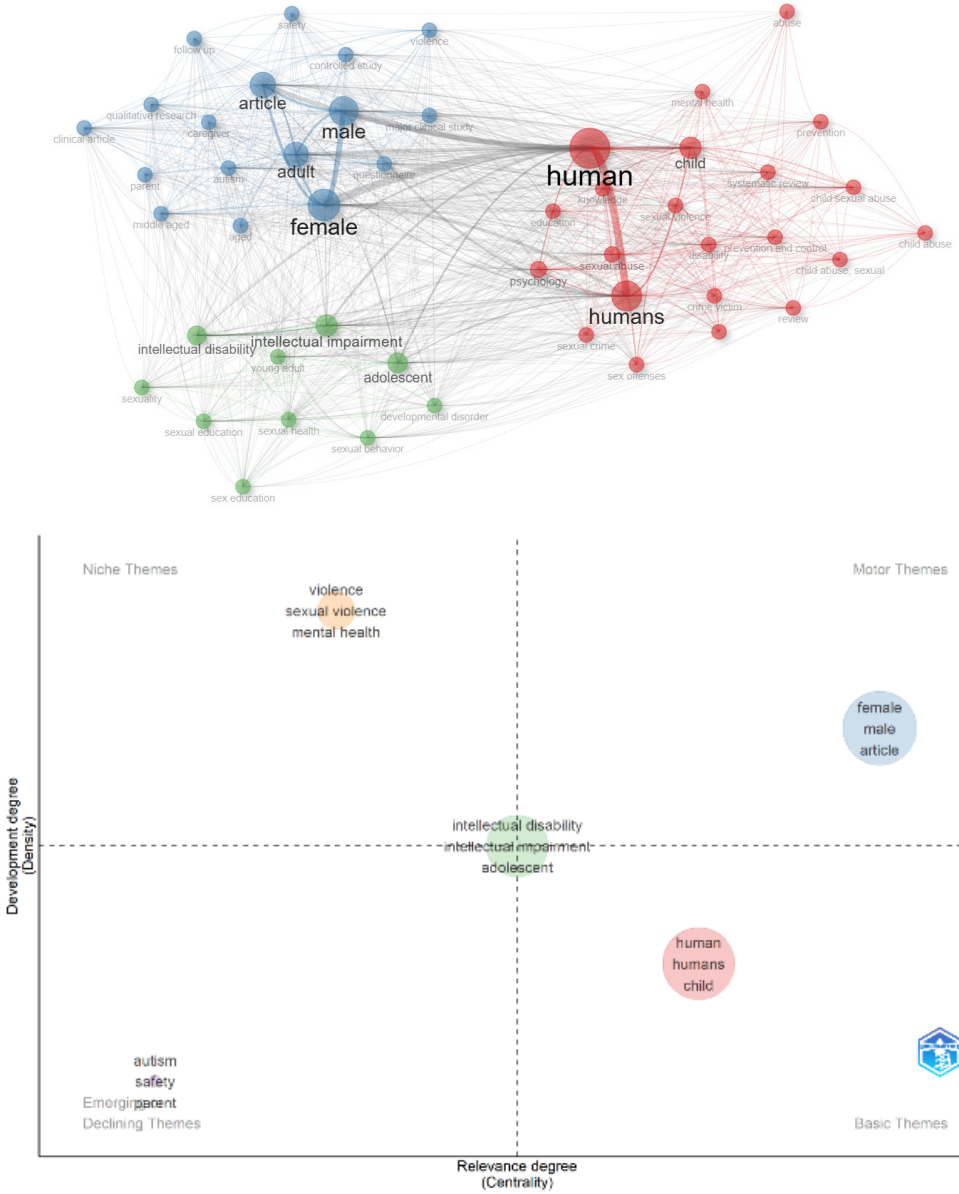

Figure 3. Thematic Maps and Keyword Networks

The keyword co-occurrence analysis shows that the terms "human," "humans," and "child" occupy central positions with the highest degree of association. Keywords such as intellectual disability, intellectual impairment, and adolescence act as bridging themes between general and specialized research areas.

Thematic mapping categorizes research topics into four quadrants. The human-child theme appears as a basic theme with high relevance but limited depth of development. Themes such as violence, sexual violence, and mental health are identified as niche themes, while autism and safety are categorized as emerging or potentially declining themes.

Country Distribution, Journal Source, and Authors

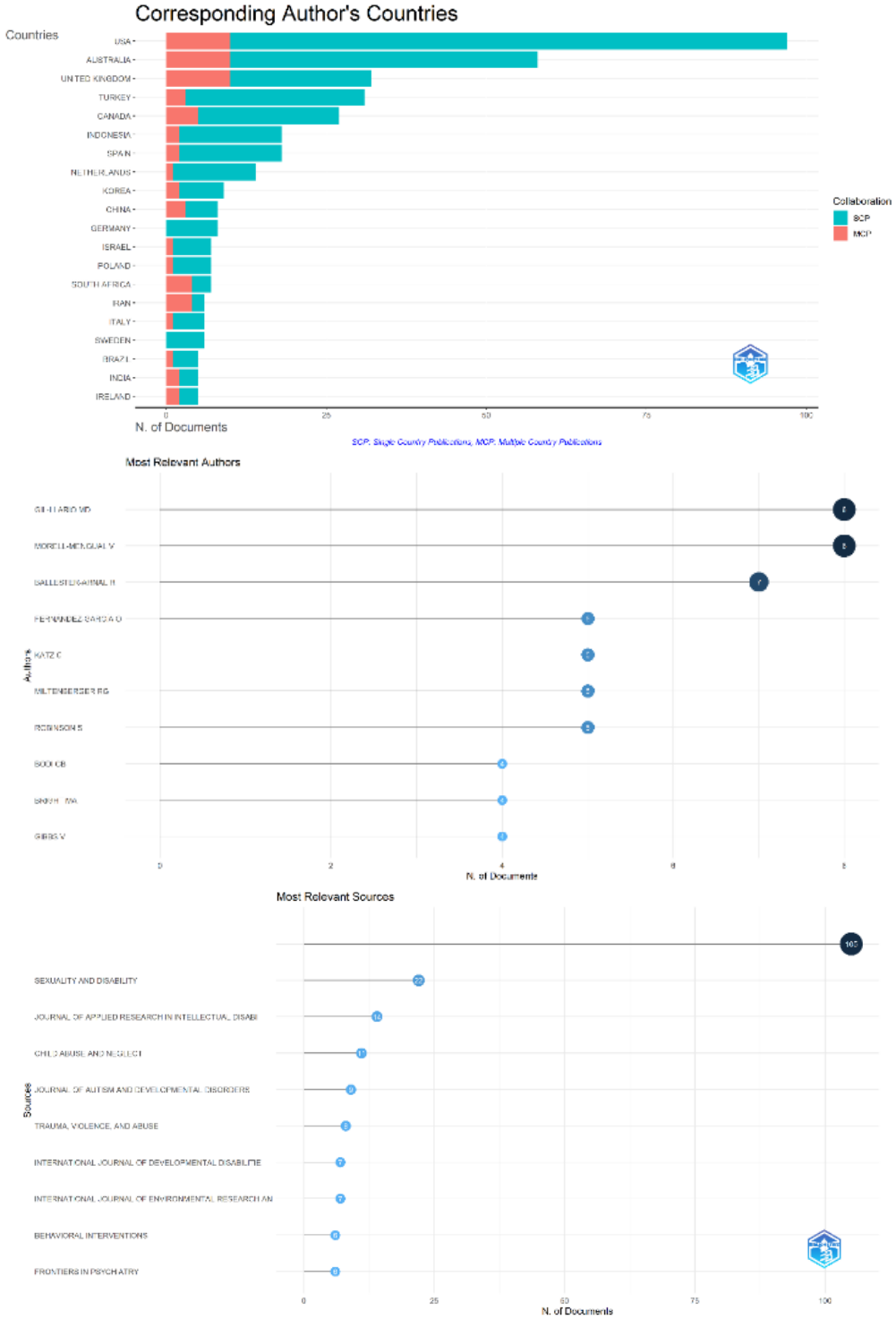

Figure 4. Country Distribution, Journal Source, and Authors

The United States contributes the most publications, followed by Australia and the United Kingdom. Contributions from developing countries, including Indonesia, are present but remain limited. This reflects the dominance of high-income countries in knowledge production, while also highlighting opportunities for more context-specific research in developing regions.

The most prominent journals include Sexuality and Disability, Journal of Applied Research in Intellectual Disabilities, and Child Abuse & Neglect. The contributing authors come from multidisciplinary backgrounds, including special education, psychology, nursing, and public health.

Study Selection Results Based on PRISMA

The study selection process followed PRISMA guidelines. From the initial 554 records identified, duplicates were removed, resulting in 497 articles. Title and abstract screening excluded 401 articles, leaving 96 articles for full-text assessment. Of these, 86 articles were excluded for lack of relevance or methodological issues, leaving 10 studies for the qualitative synthesis.

Table 1. Article Selection Stages Based on PRISMA

PRISMA	Amount (n)
Identification (Records identified from databases – Scopus)	**554**
Records after duplicates removed	**497**
Records screened (Title & Abstract)	**497**
Records excluded after title & abstract screening	**401**
Full-text articles assessed for eligibility	**96**
Full-text articles excluded (reasons documented)	**86**
Studies included in the qualitative synthesis	**10**

The ten selected studies represent diverse research designs, including systematic reviews, meta-analyses, quasi-experimental studies, randomized controlled trials, qualitative studies, and single-subject designs. The studies generally focus on body safety education, sexual violence prevention, and the development of protective understanding among children with intellectual disabilities.

Table 2. Summary of Selected Studies

Author & Year	Title	Research Design	Focus RQ	Key Findings
(Stobbe et al., 2021)	Prevention and Intervention Programs Targeting Sexual Abuse in Individuals with Mild Intellectual Disability: A Systematic Review	Systematic Review	RQ1, RQ4	Role-play-based prevention programs are dominant, but the methodological quality of the studies is still weak.
(Farlina, Mutia, 2019)	Prevention of Sexual Abuse in Children with Mental Disability: A Systematic Literature Review	Systematic Review	RQ1, RQ2	Simulation-based education and training effectively increase self-protection awareness.
(Aini, 2023)	"Underwear Rule" in Improving Sexual Abuse Prevention Attitudes among Parents of Intellectual Disabilities Adolescent	Pre-experimental	RQ3	Simple visual interventions increase protective attitudes of parents of children with DI.
(Kim, 2016)	Evaluation of a Sexual Abuse Prevention Program for Children with Intellectual Disabilities	Single-subject experimental	RQ3	Body identification, refusal, and reporting training is effective and sustainable.
(Oliveira et al., 2025)	Sex Education for Individuals with Intellectual Development	Scoping Review	RQ1, RQ4	Visual media and practical activities enhance knowledge and self-protection.

Author & Year	Title	Research Design	Focus RQ	Key Findings
	Disorder (IDD): A Scoping Review			
(Yusof & Norhayati, 2022)	Effectiveness of school-based child sexual abuse intervention among school children in the new millennium era: Systematic review and meta-analyses	Systematic Review & Meta-analysis	RQ2, RQ3	Effective school programs increase knowledge and skills in protection.
(Begjani et al., 2025)	The effect of an educational program on knowledge about sexual abuse prevention among child laborers: a quasi-experimental study	Quasi-experimental	RQ3	Structured education significantly increases prevention knowledge.
(Akgül, 2025)	The effect of nurse-led body protection education on the sexual abuse knowledge levels of students with visual impairments: a randomized controlled trial	Randomized Controlled Trial	RQ3	Body protection education increases understanding of safe/unsafe touch.
(Celik & Lithari, 2026)	Relationships and Sex Education in Special Schools	Qualitative study	RQ1, RQ4	RSE in special schools is crucial for safeguarding DI children.
(Keller & Weintraub, 2020)	Validity and reliability of the 'Leisure Participation Observation' among adults with intellectual disabilities: A pilot study	Instrument development study; pilot study with quantitative psychometric testing	RQ2	The LPO demonstrated strong content validity through expert judgment, moderate–high inter-rater reliability, low–moderate but significant test–retest reliability, and acceptable internal consistency ($\alpha = .74$), indicating that it is a promising observational tool for assessing leisure participation in adults with moderate intellectual disabilities.

It is important to note that not all included studies explicitly focused on technology-based visual-social media as the primary intervention. Several studies examined broader educational approaches, such as role-play programs, parent-based education, or general prevention strategies. This indicates a partial misalignment between the initial focus of this review and the characteristics of the available evidence.

Consequently, the synthesis presented in this study reflects a broader spectrum of body safety education approaches, rather than exclusively technology-based interventions. This limitation should be considered when interpreting the extent to which visual-social media can be identified as a dominant or primary approach.

Synthesis of Results Based on Research Questions

The synthesis of the selected studies indicates that visual and technology-supported approaches may contribute to improving knowledge, attitudes, and protective skills related to body safety among children with intellectual disabilities. However, these findings should be interpreted with caution, given the heterogeneity in study designs, intervention types, and levels of methodological rigor across the included studies.

Furthermore, while the bibliometric analysis provides a broader overview of research trends based on 554 publications, it is not fully aligned with the qualitative synthesis of the 10 selected studies. Therefore, the bibliometric findings should be interpreted as contextual background rather than direct evidence of intervention effectiveness.

Overall, the findings suggest that visual and technology-supported approaches have promising potential in supporting body safety education. However, current evidence remains limited and varied, and does not yet allow for strong conclusions regarding their effectiveness.

Discussion

This section critically interprets the Systematic Literature Review findings in relation to existing theories and previous research. The discussion examines the role of visual and technology-supported approaches in body safety education for children with intellectual disabilities, while also highlighting variations, limitations, and inconsistencies identified across the included studies.

Technology-Based Visual-Social Media as an Adaptive Pedagogical Approach

The findings suggest that visual and technology-supported approaches represent one of several pedagogical strategies used in body safety education for children with intellectual disabilities, rather than a consistently dominant approach. These approaches are particularly relevant because they align with cognitive and multisensory learning principles that emphasize concrete representation, repetition, and contextual learning.

Visual-social media, such as scenario-based videos and digital simulations, provide opportunities for observational learning and behavioral modeling. However, the extent to which these approaches are more effective than other methods remains unclear, given the variability of interventions and study designs identified in this review.

The Impact of Social-Visual Media on Body Safety Learning Outcomes

The reviewed studies indicate that many interventions report improvements in knowledge, attitudes, and protective skills related to body safety. However, these outcomes are not exclusively attributable to technology-based visual-social media, as several studies employed non-digital or mixed-intervention approaches. This suggests that improvements may result from broader instructional strategies rather than solely from the use of technology.

Compared to conventional approaches, social-visual media offers advantages in message clarity and the consistency of material presentation. Repetitive and structured visual representations help reduce the ambiguity inherent in verbal explanations. Additionally, the use of technology makes learning more interactive and engaging, positively impacting children's attention and engagement during the intervention process.

Effectiveness of Intervention and Sustainability of Impact

Some studies employing experimental and quasi-experimental designs suggest positive outcomes following structured interventions. However, the strength of this evidence is limited by small sample sizes, short intervention durations, and the lack of long-term follow-up. Therefore, while the findings indicate potential benefits, they do not provide sufficient evidence to establish the effectiveness of technology-based visual-social media as a standalone intervention.

However, the effectiveness of the intervention is also highly influenced by the quality of the research design and the implementation context. Studies with longer intervention durations and support from the school or family environment tend to show more stable results. This indicates that technology-based visual-social media should be viewed as part of a broader intervention system, rather than as a single, standalone solution.

Methodological Gaps and Research Challenges

Although the research results generally show a positive impact, the bibliometric discussion and qualitative synthesis reveal several significant methodological limitations. Many studies use small sample sizes and pre-experimental designs, limiting the generalizability of their findings. Additionally, long-term evaluations of the sustainability of children's understanding and protective behaviors are still relatively rare.

From a thematic perspective, bibliometric mapping shows that the issues of intellectual disability and body safety education are still often positioned as fundamental themes. At the same time, the integration of visual-social technology as the main focus of intervention has not developed optimally. This indicates a gap between the potential of educational technology and its empirical implementation in special education. Future research needs to develop a more explicit conceptual framework for linking technology-based visual-social media.

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From a thematic perspective, bibliometric mapping shows that the issues of intellectual disability and body safety education are still often positioned as fundamental themes. At the same time, the integration of visual-social technology as the main focus of intervention has not developed optimally. This indicates a gap between the potential of educational technology and its empirical implementation in special education. Future research needs to develop a more explicit conceptual framework to link technology-based visual-social media to measurable, sustainable body safety learning outcomes.

A critical issue identified in this review is the inconsistency between the stated focus on technology-based visual-social media and the characteristics of the included studies. Several studies did not explicitly implement technology-supported interventions, which limits the ability to draw specific conclusions regarding their effectiveness. This highlights the need for future research to more clearly define and operationalize visual-social media interventions within the context of body safety education.

Theoretical Implications of Research Findings

Theoretically, these SLR findings support the argument that body safety education for children with intellectual disabilities should be based on a concrete, contextual, and experiential learning approach. Technology-based visual-social media has proven relevant to the principles of adaptive learning and instructional differentiation in special education. Additionally, these findings expand understanding of the role of educational technology not only as a means of delivering information, but as a tool for pedagogical transformation capable of bridging cognitive limitations and child protection needs.

CONCLUSION

This study provides a systematic overview of the use of visual and technology-supported approaches in body safety education for children with intellectual disabilities. The findings indicate that these approaches have the potential to support the development of knowledge, attitudes, and protective skills related to body safety. However, the current evidence remains limited and heterogeneous, with considerable variation in intervention types, research designs, and methodological quality.

The results of this review suggest that visual social media should be understood as a potentially valuable component within a broader educational approach, rather than as a consistently effective or standalone solution. In addition, the findings highlight a gap between the conceptual focus on technology-based interventions and the characteristics of the available studies, many of which do not explicitly implement technology-supported visual-social media.

Therefore, the main contribution of this study lies in mapping research trends, identifying inconsistencies, and highlighting critical gaps in the existing literature. Future research is needed to develop more clearly defined intervention frameworks, apply more rigorous experimental designs, and use standardized outcome measures to strengthen the evidence base in this field.

Overall, body safety education for children with intellectual disabilities requires a comprehensive, context-sensitive, and evidence-informed approach, in which technology-supported visual-social media can play a supportive, but not exclusive, role.

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