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ORIGINAL

Enhancing health literacy for child protection: Development and validation of a mobile application for child sexual abuse prevention education

Alfabetización en salud para la protección infantil: Desarrollo y validación de una aplicación móvil de prevención del abuso sexual infantil

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ABSTRACT

Introduction: child sexual abuse (CSA) is a global issue causing significant physical, psychological, and social impacts, urging the need for effective prevention strategies. Public knowledge about CSA in Indonesia is minimal. While parenting education interventions have proven effective in reducing child maltreatment, digital technology presents a promising yet underexplored avenue. This study aimed to develop and validate a mobile application media for CSA early prevention tailored to the educational needs of teachers and parents.
Method: this research employed a Research and Development following the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). Qualitative data collection through three Focus Group Discussions and one interview with four teachers and ten parents at Pringsewu Public Kindergarten, Lampung, Indonesia, informed the application content and structure. Subsequently, four experts in the fields of pediatric health, psychology, information technology, and early childhood education validated the app to ensure accuracy and usability. Field testing was then conducted with ten teachers and ten parents, which confirmed that the mobile application was user-friendly, educationally valuable, and well-accepted, based on the Technology Acceptance Model.
Results: the needs assessment identified three main themes: easy-to-understand CSA prevention content, engaging media for children, and educational features for both children and their guardians. The product was named Save d'Kids, a validated and pilot-tested CSA prevention mobile app.
Conclusions: save d'Kids is a digital mobile application validated by experts that shows promise in improving CSA literacy among children through teachers and parents. Future studies should involve randomized controlled trials to assess the effectiveness of Save d'Kids.

Keywords: Early Prevention; Child Sexual Abuse; Mobile Application; Education; Media.

RESUMEN

Introducción: el abuso sexual infantil (ASI) es un problema global con graves repercusiones físicas, psicológicas

y sociales, lo que evidencia la necesidad de estrategias preventivas eficaces. En Indonesia, el conocimiento público sobre el ASI es limitado. Aunque la educación parental ha mostrado eficacia en la reducción del maltrato infantil, la tecnología digital representa una vía prometedora poco explorada. Este estudio tuvo como objetivo desarrollar y validar una aplicación móvil para la prevención temprana del ASI, adaptada a las necesidades educativas de docentes y padres.
Método: se aplicó un diseño de Investigación y Desarrollo con el modelo ADDIE (Análisis, Diseño, Desarrollo, Implementación y Evaluación). Los datos se recopilaron mediante tres grupos focales y una entrevista con docentes y padres en un jardín de infancia público en Pringsewu, Lampung. Cuatro expertos en salud pediátrica, psicología, tecnología de la información y educación infantil validaron la aplicación. Una prueba de campo con docentes y padres evaluó su usabilidad y aceptación según el Modelo de Aceptación Tecnológica.
Resultados: la evaluación de necesidades identificó tres temas: contenido claro de prevención del ASI, medios atractivos para niños y funciones educativas para niños y tutores. El producto se denominó Save d'Kids, una aplicación móvil validada y probada en fase piloto.
Conclusiones: save d'Kids es una aplicación digital validada por expertos que muestra potencial para mejorar la alfabetización en prevención del ASI mediante docentes y padres. Se recomiendan futuros ensayos controlados aleatorizados para evaluar su eficacia.

Palabras clave: Prevención Temprana; Abuso Sexual Infantil; Aplicación Móvil; Educación; Medios.

INTRODUCTION

Child sexual abuse (CSA) is a global public health issue with profound physical, psychological, and social consequences. According to the United Nations Children's Fund (UNICEF), more than 370 million girls and women, approximately one in eight, and an estimated 240 to 310 million boys, about one in eleven, have experienced sexual violence before the age of 18.[1] These alarming statistics highlight the urgent need for effective prevention and intervention strategies worldwide.

In Indonesia, although national data on CSA remains limited, sexual violence consistently ranks as the most reported form of violence against children, with a prevalence of 12,9 % in 2024.[2] A systematic review emphasizes that public knowledge about CSA in Indonesia is minimal, primarily due to prevailing social taboos and legal and cultural complexities that hinder disclosure and reporting.[3] Moreover, structural risk factors such as poverty exacerbate children's vulnerability to sexual abuse.[3,4]

Local data from the Office of Women Empowerment and Child Protection (PPPA) in Lampung Province recorded 177 CSA cases and 196 victims in 2021 alone.[5] These numbers are particularly concerning given CSA's long-term effects,[6] which include mental health disorders,[7] physical injuries, heightened risk of HIV infection, maladaptive health behaviors (e.g., obesity),[8] suicidal tendencies,[9,10] and post-traumatic stress disorder (PTSD), marked by persistent fear and helplessness.[11,12]

These far-reaching consequences underscore that CSA prevention cannot depend solely on legal or clinical interventions; it must also empower families and communities to serve as the primary line of protection. Grounded in Nutbeam's model,[13] this study adopts health literacy as its theoretical framework, defining it as the capacity to access, understand, appraise, and apply health information. In the context of CSA, it enables parents and teachers to recognize risks, communicate effectively with children, and implement protective strategies. By addressing functional, interactive, and critical dimensions, enhancing health literacy among caregivers bridges the gap between knowledge and protective action, thereby reducing children's vulnerability to abuse.

While parenting education interventions have proven effective in reducing child maltreatment,[14] digital technology presents a promising yet underexplored avenue. Despite high mobile device usage in Indonesia (96 %),[15] few digital CSA prevention tools exist,[16] with only two English-language apps identified on Google Play and developed outside Indonesia.[17] These applications lack cultural adaptation and do not explicitly engage parents and teachers as key guardians. Evidence showed that while school-based initiatives can increase reporting of sexual violence,[4] engaging parents in prevention programs similarly enhances their intentions, behaviors, and ability to protect children from CSA.[18,19,20] This gap underscores the urgent need for a culturally tailored, evidence-based digital tool that empowers parents and teachers as effective agents of change in CSA prevention. We hypothesized that a culturally tailored, evidence-based mobile application could enhance CSA prevention knowledge among Indonesian parents and teachers. Accordingly, this study aimed to develop and validate a digital application designed to meet their educational needs.

METHOD

Research design

This study employed a research and development (R&D) design following the Analysis, Design, Development,

Implementation, and Evaluation (ADDIE) model. The design incorporated a mixed-methods approach, integrating qualitative and quantitative methods across different stages. The qualitative phase, conducted in Pringsewu Public Kindergarten, Lampung, Indonesia, from February to April 2024, included a needs assessment through focus group discussions with teachers and parents, as well as expert validation involving subject matter specialists. The quantitative phase, carried out from May to November 2024, comprised a pilot test using structured surveys and statistical analysis to evaluate the product. The structured survey consisted of closed-ended items developed to assess participants' perceptions of the application's usability, content comprehension, engagement, and relevance in classroom and parenting contexts.

Population and Sample

The target population of this study comprised all kindergarten teachers and parents of children enrolled in Pringsewu Public Kindergarten, Lampung, Indonesia. The sample was recruited using a purposive sampling strategy according to the following criteria: 1) being a kindergarten teacher or a parent of a kindergarten-aged child, 2) residing in Lampung Province, 3) able to use a smartphone, and 4) willing to provide informed consent. The final sample consisted of 20 toddler mothers (10 mothers for needs assessment and 10 mothers for piloting); 14 teachers (4 teachers for needs assessment and 10 teachers for piloting) in Pringsewu Public Kindergarten, Lampung; and four independent experts in pediatric health, psychology, information technology, and education (for mobile application validation). The sample size aligned with recommendations for qualitative inquiry and early pilot testing in R&D studies, ensuring data saturation and providing preliminary evidence of feasibility.

Data Collection

Data collection and the research process were conducted in several stages, following the step-by-step guidelines of the ADDIE model, as follows:

Analysis (Needs Assessment)

The needs assessment was conducted to explore user requirements regarding CSA prevention education. This phase involved three focus group discussions (FGDs) and one individual interview, engaging 14 participants (four kindergarten teachers and ten parents) from Pringsewu Public Kindergarten, Lampung. The FGDs included only female participants, while data collection for male teachers was conducted by interview to ensure gender-representative perspectives. The discussions explored participants' experiences, knowledge, preferred formats, and specific needs related to child protection education, forming the foundational input for content and design development.

Design

The design phase involved formulating the educational objectives and defining core learning outcomes for children and guardians. Key decisions included selecting CSA-related materials that were age-appropriate, culturally sensitive, and evidence-based. Educational experts and content developers collaborated to design media elements, such as animations, voiceovers, and interactive modules, that were engaging and easy to comprehend. This process resulted in a draft design blueprint for the product named Save d'Kids mobile application, including user interface mockups, content flow, and preliminary technical architecture.

Development

The development phase created a mobile application prototype according to the approved design blueprint. The development team included app developers, instructional designers, and child education specialists. After developing the prototype, four independent experts in pediatric health, psychology, information technology, and education evaluated it using a 12-item validation rubric assessing relevance, clarity, cultural appropriateness, and technical quality, with each item rated on a 4-point scale. Items and Content Validity Index (CVI) were calculated, and qualitative comments were analyzed using thematic content analysis by two independent coders. The experts evaluated the application's content accuracy, usability, age-appropriateness, and pedagogical quality. Feedback from this validation phase guided several revisions to improve the application's effectiveness and user experience.

Implementation

A pilot test was conducted at Pringsewu Public Kindergarten to assess the feasibility and initial reception of the application. The pilot involved 10 kindergarten teachers and 10 parents of TK students. Participants were instructed to interact with the application over a defined period and provided structured feedback via interviews and observation forms. The focus was on usability, content comprehension, engagement, and relevance to real-life classroom and parenting contexts. The pilot test utilized the Technology Acceptance Model (TAM) instrument, a five-point Likert scale to assess perceived usefulness, perceived ease of use, and

behavioral intention to use.[21]

Evaluation

Based on feedback collected during the pilot implementation, the application underwent a final revision to enhance clarity, engagement, and functionality. Suggestions included simplifying navigation, improving audio clarity, and adding localized examples. These improvements marked the completion of the initial development cycle of Save d'Kids, preparing it for broader deployment and future impact evaluation studies.

Data Analysis and Processing

Data analysis was conducted following each phase of the ADDIE model. In the needs assessment (analysis phase), thematic analysis was performed based on the results of focus group discussions and interviews. Audio-recorded data were transcribed and analyzed using OpenCode 4.02.[22] We followed the six stages of thematic analysis outlined by Braun et al.[23] It included generating initial codes from participant transcripts, grouping codes with similar semantic meanings, and grouping to form themes. We used the explicit or surface meaning of transcript content to form themes rather than through interpretation by the research team. The first author generated the initial codes, and all authors contributed to categorizing and defining the themes. The research team discussed and refined the themes until consensus was achieved. Data collection and analysis continued iteratively until saturation was reached.

In the development phase, expert validation results were analyzed using the Content Validity Index, calculated through both the Item-level CVI (I-CVI) and followed by the Scale-level CVI (S-CVI/Ave). In the implementation phase, the results were analyzed using both descriptive qualitative analysis and quantitative evaluation based on TAM instrument (frequencies and mean for Likert-scale items).

Ethical consideration

This research was approved by the Research Ethics Committee at the Universitas Aisyah Pringsewu, Indonesia (No. 274/UAP.OT/KEP/EC/2024). Before obtaining the data, all participants signed informed consent.

RESULTS

Analysis Results: Needs Assessment

Data collection was conducted through three focus group discussions (FGDs) involving 13 participants, two parent groups (n=10) and one teacher group (n=3), as well as one individual interview.

Table 1. Participant's characteristics

Participant	Category	Gender	Age (years old)	Education
I1	Teacher	Female	44	Bachelor
I2	Teacher	Female	54	Bachelor
I3	Teacher	Female	63	Senior high school
I4	Teacher	Male	36	Bachelor
I5	Parent	Female	37	Senior high school
I6	Parent	Female	31	Junior high school
I7	Parent	Female	42	Senior high school
I8	Parent	Female	43	Senior high school
I9	Parent	Female	40	Elementary school
I10	Parent	Female	34	Bachelor
I11	Parent	Female	30	Senior high school
I12	Parent	Female	36	Senior high school
I13	Parent	Female	35	Senior high school
I14	Parent	Female	33	Senior high school

Qualitative analysis revealed three key categories: 1) Easy-to-understand CSA prevention material covering body safety, stranger danger, and responsible gadget usage; 2) Attractive media formats for children, emphasizing visual and interactive elements; 3) Dual-function educational content for both children and guardians.

Application Design

The design phase was grounded in the needs identified during the analysis stage, particularly the demand for CSA prevention content that is easy to understand, interactive, and suitable for both children and adults. Educational objectives were formulated to focus on three key areas: 1) teaching children about body boundaries and safety, 2) helping guardians recognize signs of CSA, and 3) promoting parent-child communication about sensitive topics.

Table 2. Need assessment results

Theme	Category	Quotation
CSA prevention materials that are easy to understand	Information about CSA	"... knowledge about violence, about sexual violence, maybe education comes first" (I10).
	Body parts and how to protect them	"They should not be touched by anyone except the same gender, for example, a girl by her mother. We have to set those boundaries for children, how a girl should dress, how to behave, even with her father" (I3).
		"... and if possible, the app content should talk about our bodies, which areas can and cannot be seen or touched" (I13).
		"Oh, my child already uses a towel after bathing, and when checked, she feels embarrassed. She does not even want to pee carelessly because she is shy, and that is a good sign" (I12).
		"We teach the children what body parts are okay and not okay to be touched by boys, guiding both boys and girls so they understand each other and hopefully know the boundaries" (I2).
		"So they know their boundaries, who they can play with, who they cannot. The video shows what must not be touched or done by others" (I7).
	Awareness of people around	"We try to teach the children, even though the topic might be taboo, that if someone unfamiliar offers to pick them up or take them somewhere, they should refuse" (I1).
		"Yes, so they do not go off with strangers, and if someone touches them, especially boys, they should refuse" (I11).
	Children's gadget use	"Yes, with the phone, sometimes Facebook shows random things... I immediately say, 'You cannot watch this.' I set limits" (I5).
		"It is mostly from gadgets, Ma'am... The influence is huge. Sometimes when children are on their devices, they do not even hear their parents. My daughter is like that; she is in 4th grade. When called, she does not respond, just focused on her phone. That is why the parents' role is so important" (I13).
	Evaluating children's skills in dealing with potential CSA	"We observe their daily behavior. After watching the video, is there any change? We can tell if it is getting better" (I13).
		"I see how she responds. If she understands, she will act right away. If not, she will ask questions" (I14).
		"From their behavior, you can tell. For example, if something happens, they might ask, 'What is this?' We can observe that through the app." (I10).
Engaging media for children	Child-friendly media	"It has to be easy to understand and easy for us to explain to the children" (I3).
		"Yes, if it is in children's language, something digestible, they will absorb it more easily" (I7).
		Parent Group 2 I1: "The app is easy for children to understand."
		"Just make sure the language is simple" (I4).
		"We need to explain things like, 'If someone tries to touch this or that, say no.' But we must use language that children understand so they can get the message" (I12).
	Interesting media for children	"If the app is meant to teach children, it should have engaging visuals, like cartoons on YouTube, so it is enjoyable. If it is too formal, it is hard to explain" (I7).
		"Children's songs with rules... Yes, show videos" (I3).
		"Hopefully, the video can be more engaging, with animation, visuals, and music" (I4).
		"The app should show examples with appealing visuals, like cartoons that children understand, with videos and illustrations" (I14).
		"There should be explanations, videos, and everything, so it is clearer" (I10).
App educates both children and guardians	Educating children	"If children can see images and videos in the app, they will understand more easily, because children find visual content more engaging" (I13).
		"Children can learn through what they watch, it does not have to be too formal, like YouTube, it is quicker" (I7).
		"Nowadays most children have access to phones, so we can use them to show what is acceptable and what is not. We can even monitor what they are accessing" (I13).
	Educating parents	"An app that educates and gives examples to parents, so they know what to explain to their children, what is not allowed to be touched" (I12).

Content development incorporated storytelling, visual learning, and gamified elements to accommodate the cognitive and emotional development of preschool-aged children. Meanwhile, the parental section was designed with infographics, videos, and practical tips to support adults in initiating age-appropriate discussions and identifying risk factors.

The interface was designed using bright, engaging visuals with intuitive navigation to ensure accessibility for users with varying levels of digital literacy. These inputs culminated in a draft prototype of the mobile application, consisting of three main features: 1) animated stories to introduce CSA concepts, 2) parent guidance modules with expert-validated information, and 3) a help button feature linking to emergency contact services.

Development

The product named Save d'Kids was developed based on the finalized draft design resulting from the previous stage. Save d'Kids mobile application was subsequently validated by four experts representing relevant disciplines: pediatric health, psychology, information technology, and education. The validation process employed the Content Validity Index (CVI), including both the item-level CVI (I-CVI) and the scale-level CVI using the averaging method (S-CVI/Ave). The results demonstrated that the Save d'Kids application was valid, with an S-CVI/Ave score of 0.905 for representativeness and 0,951 for clarity, indicating a high level of expert agreement on the content's relevance and comprehensibility. Save d'Kids is now available on the Google Play Store.

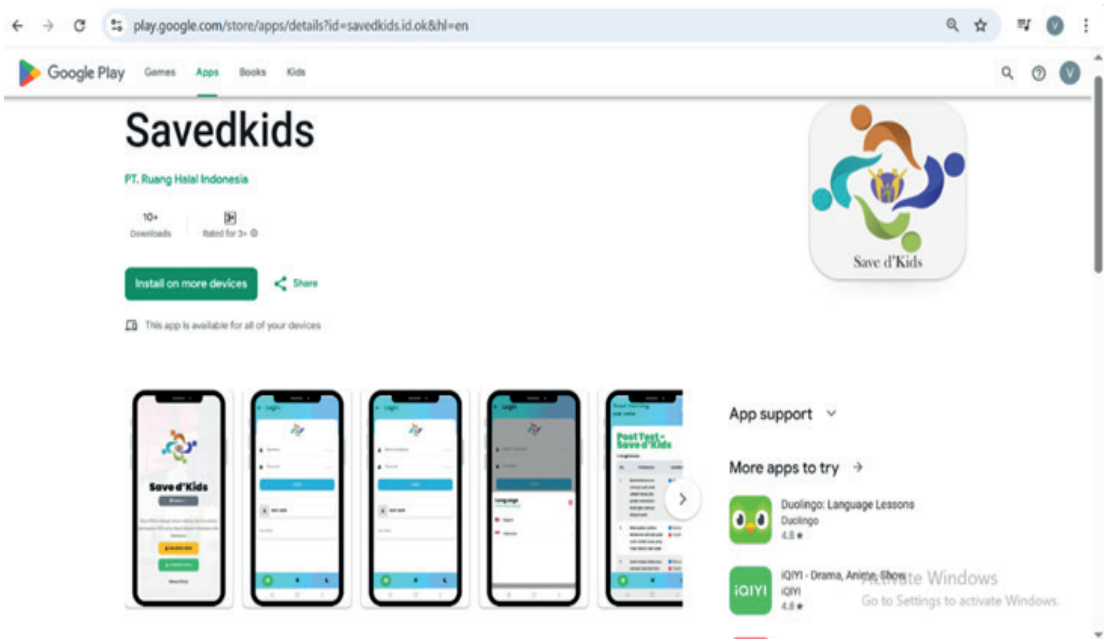

Figure 1. Home screen and visual design of the Save d'Kids application
Source: https://play.google.com/store/apps/details?id=savedkids.id.ok

Implementation

At this stage, pilot testing of the Save d'Kids mobile application was conducted at Pringsewu Public Kindergarten, located in Lampung, Indonesia. The sample included 10 early childhood education teachers and 10 mothers of preschool-aged children. Qualitative evaluation of the pilot phase indicated that the Save d'Kids application was well-received. Participants found the content accessible and easy to understand. However, several suggestions were provided by prospective users to enhance user experience and educational relevance, including: 1) Adding more interactive features for children, such as animated scenarios; 2) Including audio-visual materials to accommodate non-literate or low-literacy users; 3) Providing more practical examples of CSA prevention for parents and teachers; 4) Improving navigation flow to simplify user interaction.

Quantitative evaluation was carried out using the Technology Acceptance Model (TAM) instrument. After using the Save d'Kids application, participants completed a questionnaire assessing perceived usefulness, perceived ease of use, attitude toward using the application, and behavioral intention to use. Results of the TAM analysis are presented in table 3.

Table 3 shows that most respondents agreed that the Save d'Kids is beneficial (Perceived Usefulness = 85 %), easy to use (Perceived Ease of Use = 75 %), and that they intend to use it (Behavioral Intention to Use = 80 %).

Table 3. Technology Acceptance Model Analysis Results for Save d'Kids Application

Variable	n< Mean		n ≥Mean	
	n (20)	%	n (20)	%
Perceived Usefulness	3	15	17	85
Perceived Ease of Use	5	25	15	75
Behavioral Intention to Use	4	20	16	80

Evaluation

The researchers revised the Save d'Kids mobile application based on the feedback gathered during the pilot testing. Input from both early childhood educators and parents was carefully analyzed to identify areas for improvement, including suggestions on user interface design, language clarity, and content presentation. These refinements were implemented to enhance the app's usability, relevance, and engagement across different user groups. As a result, the Save d'Kids educational media was finalized and optimized to be ready for broader deployment in early childhood education settings.

DISCUSSION

User Needs

The needs assessment conducted in this study emphasized the importance of providing simple, engaging, and educational content for CSA prevention, which reflects existing literature on practical digital health tools. The literature states that simplicity in the user interface (UI) has been proven to be a key factor in enhancing usability on mobile devices and web portals, even more so than design consistency. A simple UI makes it easier for users to understand and operate the application, thereby increasing user credibility and satisfaction.[24] In response, Save d'Kids was developed to address critical gaps between CSA literacy and the lack of educational media.

Save d'Kids was developed in direct response to the identified educational need for school-based CSA prevention efforts, recognizing educational settings as strategic platforms for early intervention and child protection. School environments provide an ideal setting for primary prevention, given their access to large populations of children and the involvement of educators and parents. Previous studies have consistently shown over the past three decades that children who receive school-based CSA prevention programs gain significantly more knowledge about CSA prevention concepts than those who do not participate in such programs.[25]

Theoretical Foundations

By targeting both children and their guardians, "Save d'Kids" aligns with evidence showing that multi-tiered educational interventions are more effective in preventing CSA than isolated efforts. The active involvement of teachers and parents in the app's development aligns with the participatory model of intervention design. Participatory design (PD) is an iterative approach that actively involves users in the development process, progressing through need identification, idea generation, prototyping, and evaluation. Its core activities include fieldwork, literature review, and prototype development and testing, with each phase refined based on participants' contributions.[26]

The incorporation of animated media and child-friendly language in "Save d'Kids" aligns with the Cognitive-Affective-Social Theory of Learning in Digital Environments (CASTLE). CASTLE extends existing frameworks by emphasizing the role of social cues in digital materials, which activate learners' social schemata and thereby foster motivational, emotional, and metacognitive processes. Social cues in digital learning materials can amplify the influence of social processes on learning outcomes.[27] Multimedia learning suggests that animated and interactive multimedia can enhance expressive language skills, listening and reading abilities, as well as expand vocabulary and syntax in early childhood.[28,29,30,31,32] Video media is also an appealing tool for children as it facilitates the delivery of information,[33] significantly enhances children's understanding of the taught material,[34] and increases parental motivation to engage in educational activities.[35]

Technological Advantages

The proliferation of smartphones and mobile internet in Indonesia is expected to increase between 2024 and 2029 by a total of 77 million users (+44,51 %).[36] It contributes to the development of scalable and accessible CSA prevention tools. Mobile applications offer interactive and engaging formats that can overcome traditional barriers to child protection education, such as limited school resources and cultural hesitancy to discuss sexual topics. A systematic review highlighted that digital interventions, such as school-based education programs and digital applications, consistently demonstrate improvements in children's knowledge about sexual abuse and self-protective behaviors. School-based programs have been shown to enhance children's knowledge and protective behaviors. However, their impact on case disclosure is not statistically significant, and some studies report potential side effects that require further monitoring.[37] However, very few of these applications are

culturally tailored or scientifically validated, highlighting the innovation and relevance of "Save d'Kids" in the Indonesian context.

The rapid proliferation of smartphones and mobile internet in Indonesia provides an opportunity for scalable digital interventions in child protection. Digital platforms are particularly suited to overcome barriers such as limited school resources and cultural hesitancy in addressing sexual topics. While international evidence demonstrates the effectiveness of digital CSA prevention programs, very few applications are culturally tailored or linguistically accessible for Indonesian users. Save d'Kids addresses this gap by delivering scenarios and response strategies in Bahasa Indonesia, contextualized to local culture, thereby bridging both linguistic and contextual gaps. The integration of mobile technology aligns with user habits and preferences, thereby enhancing its reach and effectiveness. End-user engagement enhances the cultural relevance and usability of digital health interventions, a factor particularly vital in child protection.

Expert Validation

The application underwent expert validation across multiple disciplines in psychology, IT, and education, ensuring that the app content was developmentally appropriate, psychologically sound, and technologically functional. Additionally, "Save d'Kids" is one of the mobile applications for CSA prevention that has been designed and tested in a Southeast Asian setting, addressing a critical gap in the literature. Only two CSA prevention applications developed in Australia and Vietnam were identified in prior surveys in the Google Play Store,[17] none of which were in Bahasa Indonesia or culturally tailored. Therefore, "Save d'Kids" fills both a linguistic and contextual void by offering Indonesian-specific scenarios and response strategies.

Many studies report that educational materials and media validated by experts consistently receive very high feasibility scores and are deemed highly appropriate for use.[38,39,40] For instance, expert evaluations of various educational products (e.g., videos, e-books, modules, and digital applications) frequently yield categories such as "very valid" or "highly feasible," with such validation often correlating with positive student responses and improved learning outcomes.[40]

Despite its strengths, this study has limitations. First, the effectiveness of the application in changing knowledge, attitudes, or behaviors has yet to be tested in real-world settings. Second, while expert validation was performed, broader usability testing with a larger and more diverse sample is needed. Finally, long-term retention and behavioral outcomes remain unexamined. Future research should employ randomized controlled trials (RCTs) to evaluate the effectiveness of Save d'Kids in enhancing children's knowledge and self-protection behaviors, as well as in strengthening parental response strategies. Integrating real-time feedback, gamification elements, and culturally adaptive modules may enhance user engagement and long-term effectiveness. Adopting a multicenter approach is essential to ensure the app's generalizability and replicability. Testing across different regions allows the identification of region-specific challenges and refinements, thereby strengthening the app's external validity.

CONCLUSIONS

The Save d'Kids mobile application represents a potential step toward integrating technology into child protection initiatives while addressing the critical need to improve health literacy related to child sexual abuse prevention. Furthermore, the digital format of "Save d'Kids" allows for future scalability and integration with national school curricula and governmental child protection programs. It opens avenues for national-level adoption and policy engagement. Further studies should focus on piloting the application, gathering feedback, and refining the content to maximize both its educational impact and its effectiveness in enhancing health literacy among teachers and parents.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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