

# Usability of the CERDASIA Application (Check the Development, Nutrition, Children and Mental Health of Indonesian Adolescents) at the Sukawarna Community Health Center

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## INTRODUCTION

Monitoring early childhood growth and development is a fundamental aspect in ensuring the quality of individual health and development in the future. Toddlerhood is known as the golden

## Abstract

**Background:** Early childhood growth and development monitoring and adolescent mental health are important components of promotive and preventive efforts in primary health care. However, conventional methods are often ineffective in reaching parents and adolescents sustainably. The use of digital technology is an innovative alternative to improve access to information and the quality of health services.

**Objective:** This study aims to evaluate the usability of the CERDASIA (Cek Pengembangan, Gizi, dan Kesehatan Anak Remaja Indonesia) application as a supporting medium for monitoring child growth and development and adolescent mental health.

**Method:** This study used a descriptive design with a cross-sectional approach. Respondents consisted of parents of children aged 0–5 years and adolescents in the Sukawarna Community Health Center (Puskesmas) working area. Usability evaluation was conducted using the System Usability Scale (SUS) and a time completion test to assess ease of use, efficiency, and user experience. Data were analyzed descriptively.

**Results:** The average SUS score showed a good usability category, indicating that the CERDASIA application is easy to use, has clear navigation, and is able to increase user satisfaction.

**Conclusion:** The CERDASIA application has good usability and has the potential to become a nursing technology innovation in supporting child growth and development monitoring and adolescent mental health.

**Keywords:** Usability, Health Applications, Child Development, Adolescent Mental Health, SUS, Cerdasia.

period due to rapid physical, motor, cognitive, language, social, and emotional development. The World Health Organization reports that approximately 5–25% of preschool children experience developmental disorders, while the prevalence of developmental disorders in

Indonesia reaches 16%. Furthermore, nutritional issues such as stunting, wasting, and overweight remain major challenges in monitoring early childhood growth and development (1).

This problem is further exacerbated by a lack of understanding among some parents regarding the importance of regular growth and development detection and monitoring. Early detection is crucial to prevent delays in treatment, which can lead to permanent impairments. Monitoring is recommended every three months for children aged 0–12 months and every six months for children aged 12–72 months through various health facilities or through self-monitoring at home (2).

In addition to toddlers, adolescents are also a vulnerable group to health problems, particularly mental health. Adolescence is characterized by rapid biological, psychological, and social changes, increasing the risk of stress, anxiety, and emotional disorders (2). Data from the Indonesia National Adolescent Mental Health Survey (I-NAMHS) shows that approximately 34.9% of adolescents experienced mental health problems in the past 12 months.

With the development of information technology, the use of Android-based digital applications and websites has become an innovative solution that can support parents and adolescents in monitoring child growth and development and adolescent mental health independently, quickly, and in a targeted manner. Several studies have shown that digital applications can help improve parental knowledge, ease information access, and the effectiveness of growth and development monitoring. The applications also provide developmental screening features, growth charts based on WHO standards, immunization schedules, and documentation of child developmental milestones (3). Furthermore, the website-based application designed by Faidatun Nisa Vera Amanda has also been proven to have a good usability value (SUS score of 78.5%), indicating that the application is easy to use and effective in helping parents access comprehensive information on child growth and development (4).

New applications must be tested for usability. Usability is an analysis to evaluate an application's ease of use by users quantitatively (5). Usability evaluation involves users so they can learn and use the product to achieve aspects of user comfort such as effectiveness, efficiency,

and user satisfaction with the system as a whole (6). The main objective of usability refers to the evaluation of a product or service by testing the product with users to see how far the system functions, including suitability of use to user expectations, identifying specific problems that occur in the system, and to determine the level of effectiveness, efficiency of a product and satisfaction within the scope of its users (7).

Many apps related to child development and adolescent mental health are available on the Play Store, such as Ananda, which provides features for monitoring growth and development, immunizations, and medication history. Other apps, such as Asianparent, Teman Bumil, and Game Anak Balita, are more focused on pregnant women and parenting, and therefore do not yet comprehensively integrate child development monitoring. Regarding adolescent mental health, apps like Riliv and BetterMe: Mental Health also show limitations, including paid features, technical difficulties, limited use of the Indonesian language, and limited service menu variety, which have the potential to hinder optimal utilization.

In line with these findings, the analysis of field conditions at the Sukawarna Community Health Center (Puskesmas) demonstrated a clear need for more integrated and accessible digital solutions. Interviews with parents revealed limited knowledge about ongoing child growth and development monitoring, while data from midwives indicated immunization coverage of 84% (target 95%), requiring system support in the form of immunization reminder features to improve compliance and timeliness. Furthermore, interviews with PKPR (Nursing and Child Health Center) personnel indicated that adolescents' mental health awareness remains low, characterized by reluctance to undergo independent check-ups and parental denial of adolescent mental health issues. This situation highlights a gap in promotive and preventive services for adolescent mental health that are not optimally addressed by available applications. Therefore, the Cerdasia (Indonesian Child and Adolescent Development, Nutrition, and Health Check) application was developed as a free mobile application that integrates child growth and development education, adolescent psychosocial education, immunization reminders, and online consultation services with health workers at the Puskesmas and PKPR to

improve health literacy, service access, and active parent and adolescent engagement.

Based on the background and research above, the researcher will test the usability and effectiveness of the Cerdasia application in the Sukawarna Community Health Center (UPTD) work area by involving parents and adolescents as respondents. What differentiates this application from other applications is that it combines child development and adolescent mental health in one application, especially in the Sukawarna Community Health Center work area.

## METHODS

### Research Design

This study used a descriptive design with a cross-sectional approach. This design was used to evaluate the usability of the CERDASIA (Check the Development, Nutrition, and Health of Indonesian Children and Teenagers) application based on user perceptions at a single measurement point.

### Sample

The study population was parents with children aged 0–6 years and adolescents aged 10–18 years in the Sukawarna Community Health Center (Puskesmas) work area. The sampling technique used was convenience sampling. The sample size for this study was 30 respondents who met the inclusion criteria, namely, they were willing to participate and had used the CERDASIA application. Respondents who did not complete the questionnaire were excluded from the analysis.

### Instrument

The research instrument used was the System Usability Scale (SUS) questionnaire, which consists of 10 questions on a five-point Likert scale. The SUS is a standard instrument for assessing the usability of systems or technology applications and has been proven to have good validity and reliability (Brooke, 1996). It also used a time completion test.

### Content

The content development of the CERDASIA application was carried out by identifying

educational needs from the perspective of health workers and users. The child features include a child profile containing basic data such as identity and anthropometry to monitor development in an organized manner, a growth and development guide for children aged 0–6 years according to age stages and how to stimulate them, balanced nutrition education complete with menu recommendations, a calculator and nutritional status graph, information on growth and development danger signs, and an immunization reminder feature.

The youth features include youth profiles containing identity and anthropometric data, self-screening for mental health, educational videos on four common mental health disorders among adolescents, signs and symptoms, and how to overcome mental health disorders, as well as a chat consultation service directly connected to the Sukawarna Community Health Center hotline for support related to adolescent growth and development, nutrition, and mental health. The app's content validation process is conducted through a review by a team of experts consisting of PKPR nurses, midwives, and supervising lecturers. Content revisions are then made based on expert input to ensure the content presented is accurate, relevant, and appropriate to the context of primary health care.

### Producer

The study began with an explanation of the research objectives and how to use the CERDASIA application to respondents. Respondents were then asked to use the application according to their individual needs. After using the application, respondents completed a SUS questionnaire to assess their level of ease of use, efficiency, and satisfaction with the CERDASIA application.

### Data analysis

Data analysis was conducted using quantitative descriptive methods. SUS scores were calculated according to the assessment guidelines and then averaged to obtain a final usability score. These scores were interpreted based on usability categories, with a score of  $\geq 68$  indicating an acceptable level of usability. The analysis results are presented in tabular and narrative form.

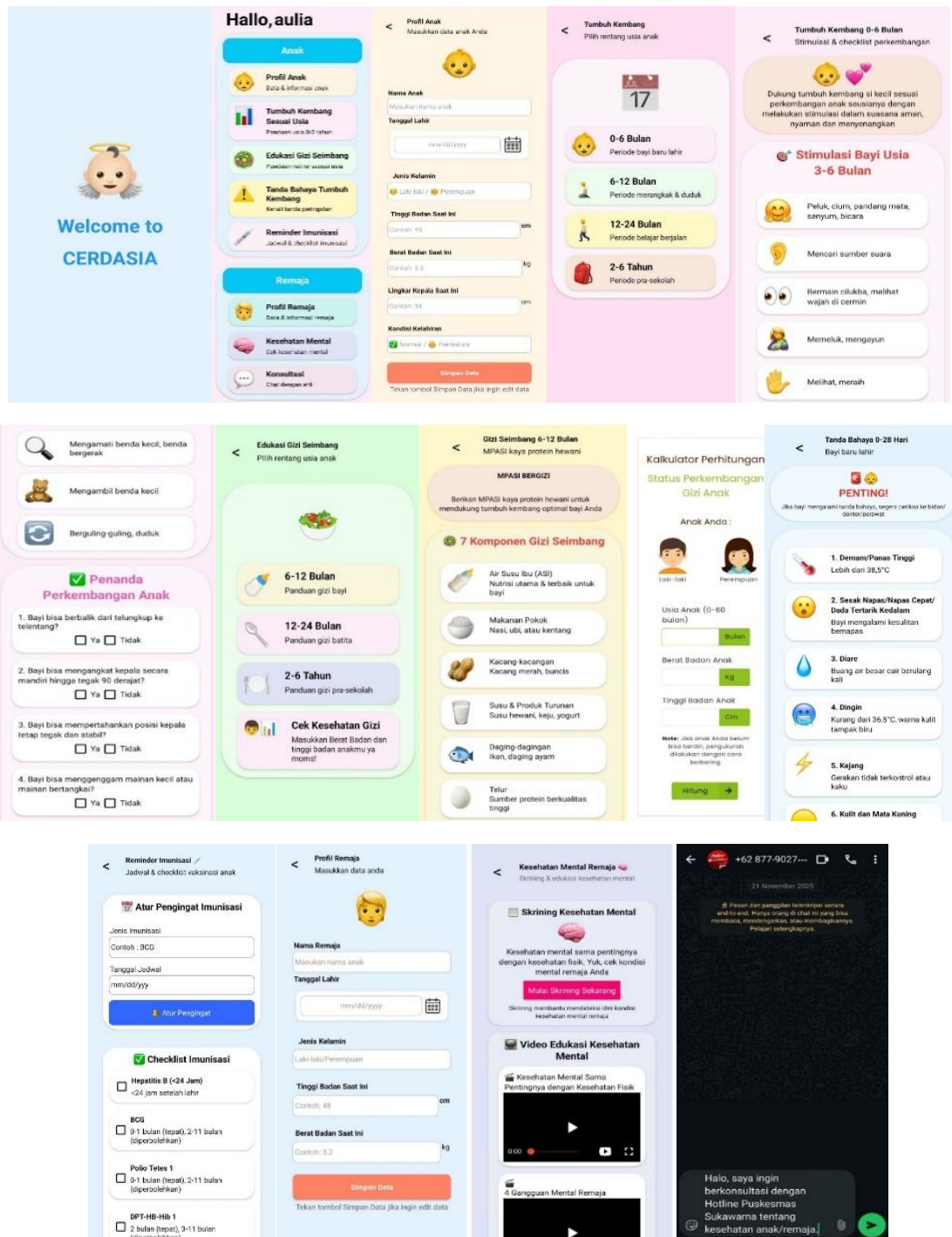


Figure 1. Cerdasia Application Design

**RESULTS**

**Table1.Characteristics of Parent Respondents**

	<b>Median ± SD / n</b>	<b>Min-Max / %</b>
<b>Age</b>	28.50 ± 9.208	22-57
<b>Gender</b>		
Woman	12	75%
Man	4	25%
<b>Parental Education</b>		
Elementary School	1	6.3%
JUNIOR HIGH SCHOOL	6	37.5%
SENIOR HIGH SCHOOL	7	43.8%
D3	2	12.5%
<b>Parents' job</b>		
Housewife	11	68.8%
Self-employed	2	12.5%
Employee	3	18.8%
<b>Number of children</b>		
1	3	18.8%
2	9	56.3%
3	4	25%

**Table2. Characteristics of Teenage Respondents**

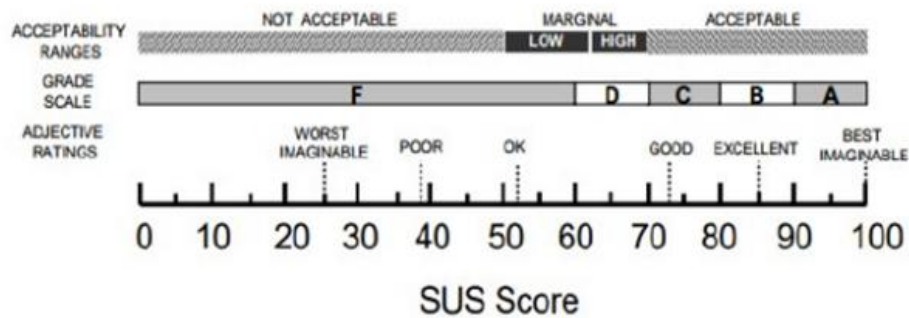
	<b>Median ± SD / n</b>	<b>Min-Max / %</b>
<b>Age</b>	14.50 ± 2.045	11-18
<b>Gender</b>		
Woman	9	64.3%
Man	5	35.7%
<b>Education</b>		
JUNIOR HIGH SCHOOL	6	42.9%
SENIOR HIGH SCHOOL	8	57.1%
<b>Internet Usage Duration</b>		
<2 hours	1	7.1%
2-6 Hours	5	35.7%
>6 Hours	8	57.1%

**Table3. Usability Test Results**

<b>Question</b>	<b>N</b>	<b>Mean</b>	<b>Std. deviation</b>	<b>Min</b>	<b>Max</b>
I think I will use the smart app again	30	3.23	0.504	2	4
I find the smart app complicated to use	30	3.30	0.702	1	4
I find the smart app easy to use	30	3.50	0.509	3	4
I need help from others for techniques in using the smart app	30	2.93	0.691	1	4
I feel the features of the smart app are working as they should.	30	3.43	0.626	2	4
I feel like there are a lot of things that are inconsistent.	30	3.27	0.640	2	4
I feel like other people will understand how to use the smart app quickly.	30	3.33	0.547	2	4
I find the smart app very confusing	30	3.17	0.529	2	4
I feel there are no obstacles in using the smart application	30	3.23	0.568	2	4
I need to get used to it first before using the intelligentia application	30	3.03	0.490	2	4

**Table 4. Usability table**

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	JLMH	QTY x 2.5
3	3	3	2	4	3	3	3	3	3	30	75
3	3	4	3	3	4	2	2	3	3	30	75
3	4	4	3	4	3	4	4	4	3	36	90
3	4	4	3	4	3	4	3	3	3	34	85
4	3	4	4	4	4	4	4	4	3	38	95
3	4	4	3	4	4	4	4	4	3	37	92.5
4	3	3	3	4	3	3	3	4	3	33	82.5
4	4	4	4	4	4	4	3	3	3	37	92.5
3	2	3	3	3	3	4	3	3	3	30	75
3	4	4	3	4	4	4	3	3	3	35	87.5
4	4	4	4	4	4	3	3	4	3	37	92.5
3	3	3	3	3	3	3	3	3	3	30	75
3	3	3	3	3	3	3	3	3	3	30	75
4	4	4	3	4	3	4	4	4	4	38	95
3	3	3	2	3	3	3	3	3	2	28	70
4	4	4	3	3	4	4	2	3	4	35	87.5
3	4	4	3	3	3	3	3	3	3	32	80
2	3	3	2	3	4	3	2	3	3	28	70
3	4	4	3	4	4	3	4	3	3	35	87.5
3	4	4	4	4	3	4	4	4	4	38	95
3	1	3	4	2	2	3	3	4	2	27	67.5
3	3	3	1	4	4	3	4	3	3	31	77.5
3	3	3	3	3	3	3	3	3	3	30	75
3	3	3	3	4	4	3	3	4	3	33	82.5
4	3	4	3	4	3	4	3	2	3	33	82.5
3	3	3	3	3	3	3	3	3	3	30	75
3	3	3	3	3	3	3	3	2	4	30	75
3	3	4	2	2	2	3	3	3	2	27	67.5
4	4	3	2	3	2	3	4	3	3	31	77.5
3	3	3	3	3	3	3	3	3	3	30	75
<b>TOTAL</b>										973	2432.5
<b>MEAN</b>										<b>81</b>	



**Figure 2. SUS Interpretation**

**Table 5. Application User Satisfaction Test Results**

Question	Score				
	1	2	3	4	5
1. Are you satisfied with using the Cerdasia application?	0	0	0	10 (33.3%)	20 (66.7%)
2. Does the menu or feature work properly?	0	0	0	8 (26.7%)	22 (73.3%)
3. Is the Cerdasia application very useful for its users?	0	0	0	9 (30%)	21 (70%)
4. Overall, does the Cerdasia application help in getting services or problems?	0	0	0	8 (26.7%)	22 (73.3%)
5. In general, are you happy with the Cerdasia application?	0	0	0	9 (30%)	21 (70%)
6. Does this application require any special skills?	0	0	1 (3.3%)	18 (60%)	11 (36.7%)
7. Can users of the Cerdasia application save time and costs in getting services?	0	0	0	11 (36.7%)	19 (63.3%)
8. Is the Cerdasia application easy to understand and learn?	0	0	0	7 (23.3%)	23 (76.7%)
9. Is the display of menu features in the Cerdasia application complete?	0	0	0	9 (30%)	21 (70%)
10. Do you use the Cerdasia application due to the influence of social media or mass media?	0	0	1 (3.3%)	8 (26.7)	21 (70%)

**Table 6. Time Completion**

No	Task	Completion rate	Times
1	Download and install application	30/30	57/155
2	Fill in the questionnaire	30/30	20/45
3	Login	30/30	5/12
4	Find your homepage	30/30	1/3
5	Find the data menu	30/30	1/5
6	Find the position and time settings sensor menu	30/30	14/34
7	Find educational videos	30/30	2/28
8	Find the discussion or help menu	30/30	3/17
9	Total time users use the smart app	30/30	60/240

Based on Table 1, the majority of parent respondents are of productive age, with the dominant age being 28 years, indicating their ability and active role in childcare. Based on gender, the majority of respondents were female (7). In terms of education, the majority of respondents had a high school education (8). Meanwhile, based on employment status, the majority of respondents were housewives (9).

Based on Table 2, the majority of respondents were 14-year-old adolescents who are in early adolescence and vulnerable to psychosocial changes. Based on gender, the majority of respondents were female (9 respondents). In terms of education, the majority of respondents

were high school students (8 respondents). Furthermore, the majority of respondents (8 respondents) spent more than 6 hours online. These characteristics indicate that the Cerdasia application is suited to the needs of modern adolescents who require fast, practical, and informative access to mental health information.

Based on table 3, the System Usability Scale (SUS) measurement results for the Cerdasia application obtained an average value of all statements in the range of 3.0–3.5, which indicates a tendency for respondents to agree and provide a positive assessment of the quality of the Cerdasia application. The highest mean value is found in the statement that the application is easy to use

and the features run as they should, which indicates that the application is user-friendly and provides a comfortable user experience. Respondents also stated that they did not experience significant obstacles and did not require special learning before using the application, thus indicating that the application design and navigation are clear and easy to understand. In general, the maximum value reaching 4 for almost all items reflects a very positive assessment, although there are still a small number of respondents with a minimum value of 1 to 2, which indicates obstacles in using the application.

Based on table 4, the System Usability Scale (SUS) measurement results, the application obtained an average score of 81. This score indicates that the application has met the usability feasibility standards in the Acceptable category, with a Scale Grade B, and is included in the Excellent assessment level. Thus, it can be concluded that in general, users find the application easy to use, understand its features, and are comfortable when interacting with the application interface.

A SUS score >80 indicates that the app is not only usable without significant issues but also has a high potential to be recommended to others. This is evident in the predominance of positive ratings on the questions measuring ease of use, confidence in operating the app, and minimal technical difficulties.

With these results, the application can be said to have met usability standards for use with real users. However, improvements can still be made to further enhance the user experience, particularly by identifying feature areas that scored relatively lower than other items (10,11).

Based on Table 5, the results of the satisfaction test on 30 respondents, it can be concluded that the CERDASIA application achieved a very high level of satisfaction. The majority of respondents gave scores of 4 and 5 on all questions, indicating that users are satisfied and strongly agree with the application's performance, feature benefits, ease of use, and time and cost efficiency. The application was also considered easy to understand, did not require special skills, and had a comprehensive menu display, thus providing a positive experience for users. Overall, these results illustrate that the CERDASIA application successfully meets user needs and expectations (12,13).

Based on Table 6, all respondents (30/30) successfully completed all assigned tasks, indicating that the Cerdasia application is easy to use. Finding the homepage and data menu were completed within 1–3 seconds and 1–5 seconds, respectively, while the login process took 5–12 seconds and filling out the questionnaire took 20–45 seconds. Tasks with a higher level of interaction, such as finding the sensor position and time settings menu, educational videos, and discussion or help menus, were completed by all respondents within 14–34 seconds, 2–28 seconds, and 3–17 seconds, respectively. The application download and installation process took 57–155 seconds, but all respondents still successfully completed these stages. Overall, the total usage time of the Cerdasia application was in the range of 60–240 seconds, indicating the application's navigation efficiency and ease of use.

## DISCUSSION

The usability test results show that the CERDASIA application has a very good level of usability with a SUS score of 81, which is included in the acceptable category with a grade B and is in the excellent range. This score indicates that the application is easy to understand, easy to operate, and provides a positive user experience for parents and teenagers as target users. This finding is in line with research by (14), which states that health applications with high usability scores tend to be more easily accepted and recommended by users because they provide comfortable navigation, easy access to information, and a clear display (15,16).

Improvements made after usability testing also demonstrated that user feedback contributed significantly to app optimization. In the initial stages, the app's color scheme was perceived as overly feminine, and access was limited to a website link. Respondents considered this interface less universal, and that using the link risked losing the app or making it difficult to access it again. After revisions, the visuals were made more neutral, and the app can now be downloaded and installed directly on mobile devices. These improvements improved users' perceptions of visual comfort and increased their sense of security regarding app access. This finding is consistent with literature showing that inclusive interface design and providing apps with a mobile installer significantly impact user

acceptance and engagement with health apps (17,18).

Furthermore, features such as growth and development education, immunization reminders, adolescent mental health screenings, and online consultations were deemed relevant to user needs based on the situational assessment. Parents require quick access to growth and nutrition information, while adolescents require education and support related to mental health. These findings support previous research suggesting that the use of digital applications can improve health literacy, immunization compliance, and early detection skills in families (19,20). Therefore, the integration of relevant and user-friendly features in CERDASIA has the potential to increase user engagement in monitoring the health of children and adolescents.

The satisfaction test results also showed that the majority of respondents were satisfied and assessed the features in the application as functioning well. Most respondents stated that the application was useful, easy to understand, and did not require special skills to operate. These findings indicate that CERDASIA has met the aspects of effectiveness, efficiency, and satisfaction—the three main elements of usability according to the ISO 9241-11 standard. Furthermore, the high time completion rate for each usage task indicates that the application navigation is easy to learn even for users with varying levels of digital literacy. Overall, the results of this study confirm that the CERDASIA application is suitable for use as a medium for monitoring child growth and development and adolescent mental health. The integration of two health focuses in one application is a competitive advantage that is not often found in other applications, especially those relevant to the context of health services at Community Health Centers. However, further research is needed to evaluate the application's effectiveness in improving knowledge, immunization compliance, and behavioral changes in users to strengthen the application's long-term benefits.

In addition to the usability and user satisfaction test results, the findings of this study also indicate that the CERDASIA application has significant potential to increase user engagement in digital-based health monitoring. The high SUS score and efficient completion time indicate that users are able to complete core tasks, such as registration, menu navigation, accessing education, and using

consultation features without significant obstacles. This is important considering the highly diverse digital literacy levels of people in primary healthcare services such as community health centers (Puskesmas). The application's intuitive use without requiring special training strengthens the argument that CERDASIA can be a supporting medium for inclusive healthcare services and is easily adopted by various user groups. This success aligns with the Technology Acceptance Model (TAM) theoretical framework, which emphasizes that perceived ease of use and usefulness are key factors determining the level of acceptance of health technology by users. Thus, CERDASIA not only meets the usability aspect but also shows strong potential for achieving broader adoption.

The integration of child and adolescent health features into a single application provides strategic value for implementation in primary healthcare. Previous situational studies have shown an information gap between healthcare professionals, parents, and adolescents, both regarding child development and mental health. CERDASIA successfully bridges this gap by providing comprehensive educational features, immunization schedule reminders, and screening and consultation menus that enable faster interaction with healthcare professionals. This approach reflects a continuum of care model, where healthcare services are provided continuously from childhood to adolescence. Research by Tran et al. (2023) also confirmed that digital applications that combine education, screening, and referral systems have a significant impact on improving health literacy and accelerating family decision-making. With its responsive design and relevant features, CERDASIA has the potential to strengthen the role of the Sukawarna Community Health Center in providing promotive and preventive services, while simultaneously increasing family empowerment in monitoring child and adolescent health.

## CONCLUSION

Based on the usability evaluation using the System Usability Scale (SUS), the CERDASIA application demonstrated good usability and was well-accepted by users. This application has the potential to support monitoring child growth and development and adolescent mental health in primary healthcare settings, particularly community health centers.

The CERDASIA application has good usability and has the potential to be effective as a supporting tool for monitoring child growth and development and adolescent mental health in community health centers. This application can be a nursing technology innovation that supports early detection, health education, and improves the quality of primary healthcare services.

### SUGGESTION

Further development of the CERDASIA application is recommended to include integration with community health center information systems, expand interactive educational features, and conduct effectiveness tests using an experimental research design. Furthermore, brief training for users and healthcare workers is needed to maximize the application's use.

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### Author Contributions

A.S., A.A., A.Sa., A.Ag., A.R., C.A., D.A., and K.A.P. contributed to data collection, application development, and initial manuscript drafting. L.L. conceptualized and supervised the study, contributed to research design, data analysis, and critically revised the manuscript. All authors have read and approved the final version of the manuscript.

### Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

### Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request. Due to ethical considerations and the protection of participant

confidentiality, the data are not publicly available.

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