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USABILITY AND USER EXPERIENCE OF STUNTING TELEMEDICINE APP FOR STUNTING CHILDRENS MONITORING

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ABSTRACT

The prevalence of stunting in Indonesia in 2018 was 28%, and in Banyumas Regency was 32%. The study objective was to describe the satisfaction and opinions of mothers of stunted childrens about an android-based stunting telemedicine app to monitor the health of stunted childrens in the stunting locus area. This study observed all 36 mothers of stunted childrens in Mandirancan Village, Banyumas Regency. Satisfaction was measured using the System Usability Scale (SUS) questionnaire, and user experience assessment used the User Experience Questionnaire (UEQ). Based on the SUS questionnaire, the average score of maternal satisfaction for the Android-based Stunting Telemedicine app was 54.79 (OK or good enough). In addition, the UEQ measurement results showed that most aspects of User Experience (UX) were Above Average, namely aspects of attractiveness, efficiency, accuracy, stimulation, and novelty. However, the clarity aspect of the app was below average and needs some improvements. In general, the Android-based Stunting Telemedicine application was quite good for mothers to monitor the growth of their stunted children.

Keywords*: stunting, android app, telemedicine*

INTRODUCTION

Stunting is in the Sustainable Development Goals (SDGs) targets, which include the 2nd Sustainable Development Goal of eliminating hunger and all forms of malnutrition and achieving food security by 2030 (Haskas, 2020), although stunting remains a critical

public health issue (Ahmad, 2023) with the worldwide prevalence in the last five years being 37.1% in Africa, Asia 19%, and Latin America 10%(De Onis et al., 2012) while in Southeast Asia, Laos ranked first at 33%, followed by Cambodia at 32%, the Philippines at 29%, Indonesia at 28%, and Myanmar at 27%.

According to the Study on the Nutritional Status of Childrens in Indonesia, the stunting prevalence in 2019 was 27.7%, and according to the Indonesian Nutrition Status Survey (SSGI), the stunting rate decreased from 24.4% in 2021 to 21.6% in 2022(Suminar, 2022). The province with the highest stunting cases in Indonesia was NTT (43.8%), followed by West Sulawesi (40.4%), NTB (37.9%), Gorontalo (34.9%), and Aceh (34.2%) while in Central Java 27.7% cases or ranks 18th out of 34 provinces (Kemenkes RI, 2021)**.** Stunting cases in Banyumas Regency, 2018 were 32%. However, based on the 2019 "operasi timbang" (weigh skrining), there were 15.96% cases (Sadiyanto, 2020),(Sadiyanto et al., 2021)**.** In 2018, the Banyumas Regency became a priority area at national and provincial levels to implement a stunting program, and Riskesdas report showed stunting prevalence in Banyumas Regency was 32% or much higher than the national stunting prevalence target of 14%(Sadiyanto et al., 2021),(Wali et al., 2020)**.**

Efforts to reduce stunting by the Banyumas Regency Government were the Healthy Living movement, Specific Nutrition Interventions, Sensitive Nutrition Interventions, and Workshop on Stunting and Communication Strategies for Changing Stunting Prevention Practices for the community. The stunting prevention program for under-fives in Banyumas District includes providing zinc syrup for infants with PBL <48 cm, MT for underweight and malnourished childrens (formula milk), vitamin A capsules, deworming, immunization basics, nutritional status monitoring or simultaneous weighing, data collection of stunting infants and childrens, SHK (Screening for Congenital Hypothyroidism), provision of taburia for infants at risk of stunting (TB/U), counseling on balanced nutrition PMBA (infant and child feeding), provision of zinc syrup for childrens with diarrhea (Sadiyanto et al., 2021),(Wali et al., 2020). Determinants of stunting include parents' education and economic state, sanitation, proper housing, etc(Ngaisyah, 2015).

It is necessary to improve the knowledge and skills of healthcare workers so that they can effectively help communities address their health issues (HUSEIN, 2023). For people with low levels of education, demonstration-based learning was an effective teaching method, while for communities with high education levels, discussion-based education methods and cooperative counseling were better (Pratomo, 2015)**.** Digital transformation is a crucial aspect that impacts people, businesses, and technology in several companies or institutions. The Indonesia Health 2024 technology transformation project has made it a top priority. During the pandemic, digital technology had a significant role in supporting health information dissemination related to health protocols in Indonesia. Some goals of Health system transformation in 2021-2024 in the Five RPJMN and Six pillars of transformation are to improve maternal and child health and accelerate improvements in community nutrition by

educating the population. The primary issue of Health Technology Transformation, based on the blueprint of the health information technology strategy, is the development of a technology ecosystem that includes telemedicine (Rudi, 2022**).** Telemedicine is one of the option to individual therapy sessions with health care experts. The government is promoting telemedicine as a digital transformation in the health industry to facilitate remote consultations between health service providers and patients during the pandemic(Sari & Wirman, 2021**).**

Telemedicine is an effort to provide health services (health consultation, treatment, prevention of disease and injury, etc.) remotely by all health professionals through information technology (Ryu, 2012**).** The government encourages healthcare providers to use telemedicine to provide remote consultations between patients and healthcare providers (Sari & Wirman, 2021). During the COVID-19 pandemic, almost all levels of society use social media to communicate with friends or coworkers (Widianawati et al., 2021), such as WhatsApp. WhatsApp is an alternative tool to conduct health counseling for the community. A previous study said WhatsApp could support adolescent anxiety control efforts during the COVID-19 pandemic (Renityas & Sari, 2021). Pregnant women were more satisfied using the telemedicine education model than direct assistance (Cahyati et al., 2021**).** Providing education, counseling, and early detection of risk groups using Android-based apps could support stunting prevention, considering that child growth is essential to improving human resources quality (Iswari & Hartati, 2022**).**

METHODS

This research is a quantitative study to measure the satisfaction and opinions of stunting children mothers regarding the Stunting telemedicine app and the app's main menu to design an android-based stunting telemedicine in the stunting childrens' health monitoring in the stunting locus area, Banyumas Regency. Two stunting locus areas selected used purposive sampling. Before filling out the questionnaire, we asked mothers of childrens to input data related to their childrens, use the report menu in the app, and then open the education menu to get information about stunting. The app also allows mothers to access the stunting mapping menu to find the stunting locus areas in Banyumas Regency and get information about their children's condition on the Analysis and Recommendations menu to get recommendations according to their children's condition. In addition, the app has a chatbot menu for direct consultation about stunting with automatic answers by the system.

Furthermore, a questionnaire was distributed to 36 mothers of stunted childrens to measure the satisfaction of using the Android-based stunting telemedicine app. Measurement of app user satisfaction used the System Usability Scale (SUS) questionnaire and the User Experience Questionnaire (UEQ) were used to measure the mother's experience in using the Android-based stunting telemedicine app. The System Usability Scale (SUS) questionnaire consists of 10 questions with five answer options on a Likert scale (1 to 5) ranging from strongly disagree to agree. The SUS score range is 0 to 100 with the following criteria for the satisfaction level of app

use: 0-25 (worst imaginable), 25.1-51.6 (poor), 51.7-62.6 (ok), 62.7-72.5 (good), 72.6-84.0 (excellent), and 84.1-100.0 (best imaginable). User Experience Questionnaire (UEQ) consists of 26 questions with seven answer options (0 to 7). The UEQ measurement results describe several user experience (UX) aspects of an application or product, like attractiveness, clarity, efficiency, accuracy, stimulation, and novelty. We analyzed each UEQ results using data analysis tools with the following criteria:

Table 1. UEQ Categories

UX Aspects	Excellent	Good	Above Average	Below Average	Bad
Attractiveness	>1,84	1,58-1,84	1,18-1,57	0,69-1,17	<0,69
Clarity	>2	1,73-2	1,2-1,72	0,72-1,1	<0,72
Efficiency	>1,88	1,5-1,88	1,05-1,4	0,6-1,04	<0,6
Accuracy	>1,7	1,48-1,7	1,14-1,47	0,78-1,13	<0,78
Stimulation	>1,7	1,35-1,7	1-1,34	0,5-0,9	<0,5
Novelty	>1,6	1,12-1,6	0,7-1,11	0,17-0,6	<0,16

RESULTS AND DISCUSSION

The Android-based Stunting Telemedicine App for Stunting Childrens Health Monitoring focuses on recording and sending information on children health status screening via WhatsApp. The purpose of making this app was to provide recommendations for stunting childrens and instruments for healthcare workers at first-level healthcare facilities to provide better health services for the community, especially groups of stunting childrens. The Android-based Stunting Telemedicine App is as follows:

There were 36 respondents of stunted

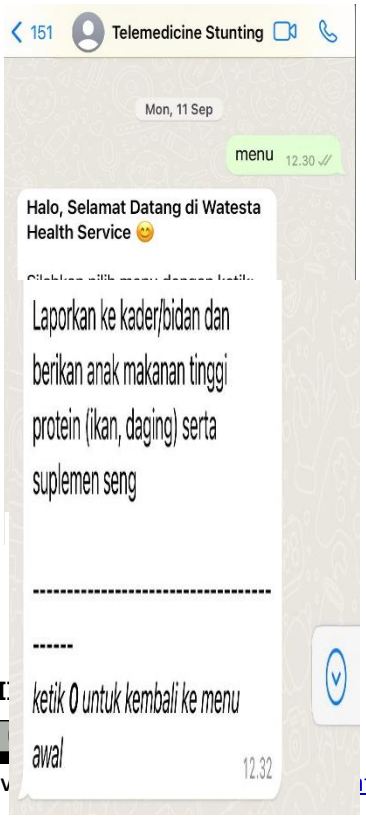

Figure 7. View of Diagnosis and Recommendation Menu

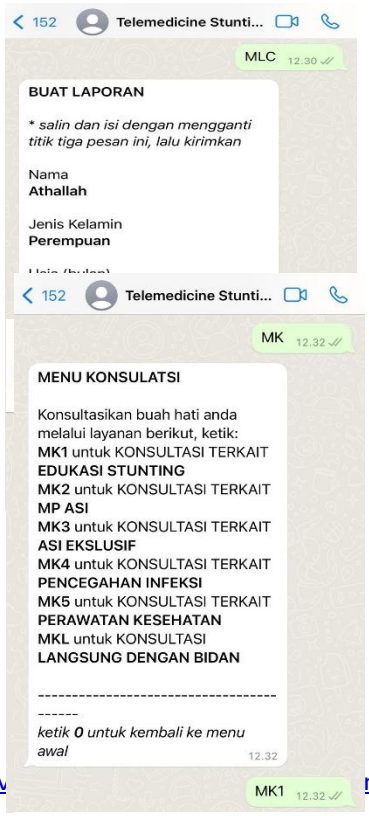

Figure 8. Consulation Menu View s

Figure 9. View of Direct Consultation Menu with Midwife

children mothers in Madiracan Village, Banyumas District. The mother's characteristics from Table 2. showed that the majority of mothers were 26-35 years old (61%), the father's age was 26-35 years old (53%), the mother's (61%) and father's 44%) of stunted childrens was high school graduate, the mother's had no formal occupation (81%), the father's occupation was a private employee (69%), female stunted childrens (61%), childrens with normal nutrition category (83%), and the parents had one children (94%). The results of SUS and UEQ questionnaires on mothers of childrens are displayed in Table 3 and Table 4 as follows.

Table 2. Characteristic of Respondents

Characteristics		f	%
Mother's Age	<=25 years	2	6.0
	26-35 years	22	61.0
	36-45 years	11	31.0
	>45 years	1	3.0
Mother's Education	SD (Elementary)	6	17.0
	SMP (Junior High)	2	6.0
	SMA (Senior High)	22	61.0
	D3 (Diploma-III degree)	2	6.0
	S1 (Bachelor degree)	4	11.0
Mother's Occupation	No formal occupation (Housewife)	29	81.0
	Private Sector Employee	4	11.0
	PNS/BUMN (Civil Servant)	3	8.0
Father's Age	<=25 Tahun	1	3.0
	26-35 Tahun	19	53.0
	36-45 Tahun	11	31.0
	>45 Tahun	5	14.0
Father's Education	SD (Elementary)	6	17.0
	SMP (Junior High)	7	19.0
	SMA (Senior High)	16	44.0
	D3 (Diploma-III degree)	3	8.0
	S1 (Bachelor degree)	4	11.0
Father's Occupation	Private Sector Employee	25	69.0
	Self-Employed	6	17.0
	PNS/BUMN (Civil Servant)	5	14.0
Children's Sex	Male	14	39.0
	Female	22	61.0
Children's Age	0-6 months	7	19.0
	7-12 months	9	25.0
	13-18 months	8	22.0

Characteristics		f	%
	18-24 months	12	33.0
Children Nutrition Status	Normal	30	83.0
	Undernutrition	5	14.0
	Malnutrition	1	3.0
Number of Children	1	34	94.0
	2	2	6.0

Table 3 shows that the average score of maternal satisfaction after using our Android-based Stunting Telemedicine App was 54.79 or classified as OK. Furthermore, table 4

Table 3. SUS Questionnaire Results among Mothers

Variable	Mean	Classification
SUS	54,79	*OK*

displayed UEQ results for each aspect (attractiveness, clarity, efficiency, accuracy, stimulation, and novelty). Most UEQ aspects like attractiveness, efficiency, accuracy, stimulation, and novelty were in the above-average category, which means mothers of childrens' experience while using our Android-based Telemedicine Stunting app was good. However, the clarity aspect was below average, so the clarity of information needs improvement. Based on SUS and UEQ, our Android-based Telemedicine Stunting app was good for mothers to monitor their stunted children's growth and health status.

Table 4. UEQ Results among Mothers

UX Aspects	Mean	Category
Attractiveness	1,25	*Above average*
Clarity	0,88	*Below Average*
Efficiency	1,20	*Above Average*
Accuracy	1,26	*Above Average*
Stimulation	1,34	*Above Average*
Novelty	0,99	*Above Average*

Based on the User Experience of toddler mother's, the clarity aspect reaches the lowest score which indicate that mothers feel a bit confuse about how to use the application. This result also similarly achieved by the previous study (Kartini et al., 2023) which the clarity aspect is the lowest aspect instead all of the aspects used in the waste management system. The average SUS score revealed that this score categorized as "OK", so that toddler mother's feel good enough using the application. Nevertheless, some of the

healthcare system gets low rate from the respondent (Islam et al., 2020).

Mother's characteristic is mostly housewife, aged around 26-35 years old and graduated from senior high school. Meanwhile, father's characteristic is dominantly private sector employee, aged range 26-35 years old and also has senior high school educational level. Toddler's characteristic is mostly female, aged around 18-24 month and has normal nutrition status. The frequency of stunting in toddlers is correlated with low family income, low maternal education, and inadequate maternal nutritional understanding (Ni'mah, Khoirun, 2015). The toddlers who has parents with lower levels of education are more likely to experience stunting than who has parents with higher levels of education (Wali et al., 2020).

CONCLUSIONS

Based on SUS, the average score of mother satisfaction in using our Android-based Telemedicine Stunting app was 54.79 or classified as OK. In addition, the UEQ measurement results showed that most aspects of User Experience (UX) were Above Average, namely aspects of attractiveness, efficiency, accuracy, stimulation, and novelty. However, the clarity aspect was below average, so the clarity of information in our app needs some improvement. In conclusion, our Android-based Stunting Telemedicine app was good for mothers to monitor their stunted children's growth and health status.

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