



# User Satisfaction Levels about m-Health Application for Growth Monitoring and Children's Development in Yogyakarta, Indonesia

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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## ABSTRACT

**Background:** The level of user satisfaction with the m-health application has a significant impact on its long-term viability.

**Aims:** This study aims to determine user satisfaction levels about m-health applications for growth monitoring and children's development in Yogyakarta, Indonesia.

**Methods:** This was a cross-sectional study conducted from May to November 2022 in Yogyakarta,

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Indonesia. The satisfaction survey was conducted on 100 respondents in Yogyakarta, Indonesia using the RASCH method with a mean rating of 1 2 3 4, from very disagree until very agree.

**Results:** This finding showed that using RASCH method with 14 criteria the mean rate of user satisfaction is  $3.5 \pm 1.5$ . The lowest rating is about the app's usage time suits me ( $3.1 \pm 1.4$ ) and the highest rating is about the ease of use and I have many information about children health care ( $3.5 \pm 1.2$  and  $3.5 \pm 1.5$  respectively).

**Conclusion:** Based on user satisfaction evaluation tests, overall are good, for ease of use, helpfull time friendly, comfort, and providing information swiftly and properly. Futher this application needs policies to support children's health programs extensively.

*Keywords: Growth; development; children; m-health; application.*

## 1. INTRODUCTION

The Indonesian Ministry of Health, in collaboration with the United Nations Development Program (UNDP) launched the blueprint for the Health Digital Transformation Strategy 2024, which changed the focus of health services from reporting for officials to public services [1]. Digital health transformation aims to ease access to health services for 270 million people in Indonesia, both in the government and private sectors, increase preventive and promotive intervention, maintain patient safety, control patient health procedures, and even make health care more economical [1]. This transformation is an attempt at resilience toward sustainable development and mitigation to respond to the COVID-19 pandemic, post pandemic, and other disaster [2]. Several countries also developed health service transformation with various levels of accessibility and utilization of healthcare services such as Saudi Arabia [3], Singapore [4], Malawi [5], and Spain, Greece, and Taiwan [6].

Several factors are considered while determining the digital transformation of Indonesia's health care system. In January 2020, Indonesia will have 175.4 million active internet users, which corresponds to a 64% internet penetration rate, while mobile phone connectivity will increase by 4.6% to 338.2 million users from January 2019 to January 2020. This mobile phone connectivity represents 124 % of the total population of Indonesia [7]. More than 78% of Indonesians access the internet via their mobile phones, compared to 29% of laptop or notebook users and 31% of desktop computer users [8]. Increasing internet penetration and mobile phone usage enable more consumers to access mobile applications, including m-health applications. Electronic health is defined as the use of information and communication technologies for health, while m-health is a medical or public

health practice that is supported by mobile devices [9].

Indonesia is ranked 3rd in app health users after China (67%), India (63%), and Indonesia's figure iof 57% [10]. This condition has the potential to support health services that are better for saving medical costs, bridging suboptimal health care access, making it easier to deliver healthcare services, allowing medical professionals and consumers to benefit from a variety of new health-related mobile phone capabilities, emergency response and disaster management, disease surveillance, support for clinicians' decisions, and remote monitoring and patient care [11], as well as promote health literacy, encouraging a more balanced lifestyle, prevention, control, and management of chronic diseases [12-14].

Many factors related to the sustainability of application use, such as system, design, quality, information, and user satisfaction may be related to perceived enjoyment, features, and an encouraging experience for its users [15,9]. Environmental support, finance, collaborations, organizational capability, program assessment, strategic planning, government backing, and engagement with non-governmental organizations are factors closely associated with the sustainability of m-health technology use [5]. A study in Indonesia reported that design, data confidentiality guarantee, and performance expectancy when developing the applications are key to the adoption of an m-health application [16]. The m-health application for monitoring growth and development has been widely used. In this study, we have successfully developed the m-health application based on the new rules (Ministry of Health No. 2 of 2020 concerning child growth and child development standards) and and children's development in accordance with the SDIDTK program. We built an m-health application, namely DEPA 2.1, for maternal

children, cadres, and health programmers, accessible freely from the Play Store [17]. But how to improve user satisfaction needs to be explored further.

## 2. METHODS

### 2.1 Design

This study utilized a cross-sectional survey design to obtain data on the levels of user satisfaction with mHealth applications.

### 2.2 Measurement

The questionnaire assesses user satisfaction and other criteria. This study used the RASCH measurement theory [18]. Surveys have two sections: demographic and satisfaction questions. The m-health satisfaction questionnaire consists of 14 items. The respondent is asked to rate this item on a 4-point Likert scale from very disagrees until very agrees." The questions included: 1) The app was easy to use; 2) It was very easy for me to learn to use the app; 3) I like the interface of the app; 4) I found what I needed in the app since it was organized; 5) I feel comfortable using the app in a social setting; 6) The app's usage time suits me; 7) I would continue using the app; and 8) Overall, I am satisfied with this app. 9) The app

would be useful for health and children's well-being. 10) The app improved my access to health care services; 11) The app helped me manage my children's health; 12) The app provided me with interpretation and recommendations; 13) I have much information about children's health care; and 14) This app has all the functions and capabilities I expect it to have.

### 2.3 Participants

The study population comprised the respondents taking part in the study's intervention groups (n = 100) to access the effectiveness of m-health to increase maternal knowledge and practice regarding growth children, development children, and IYCF. Briefly, interventions were provided in 3 months, including educational interventions for maternal children using m-health applications, either with the assistance of researchers or not.

### 2.4 Statistical Analysis

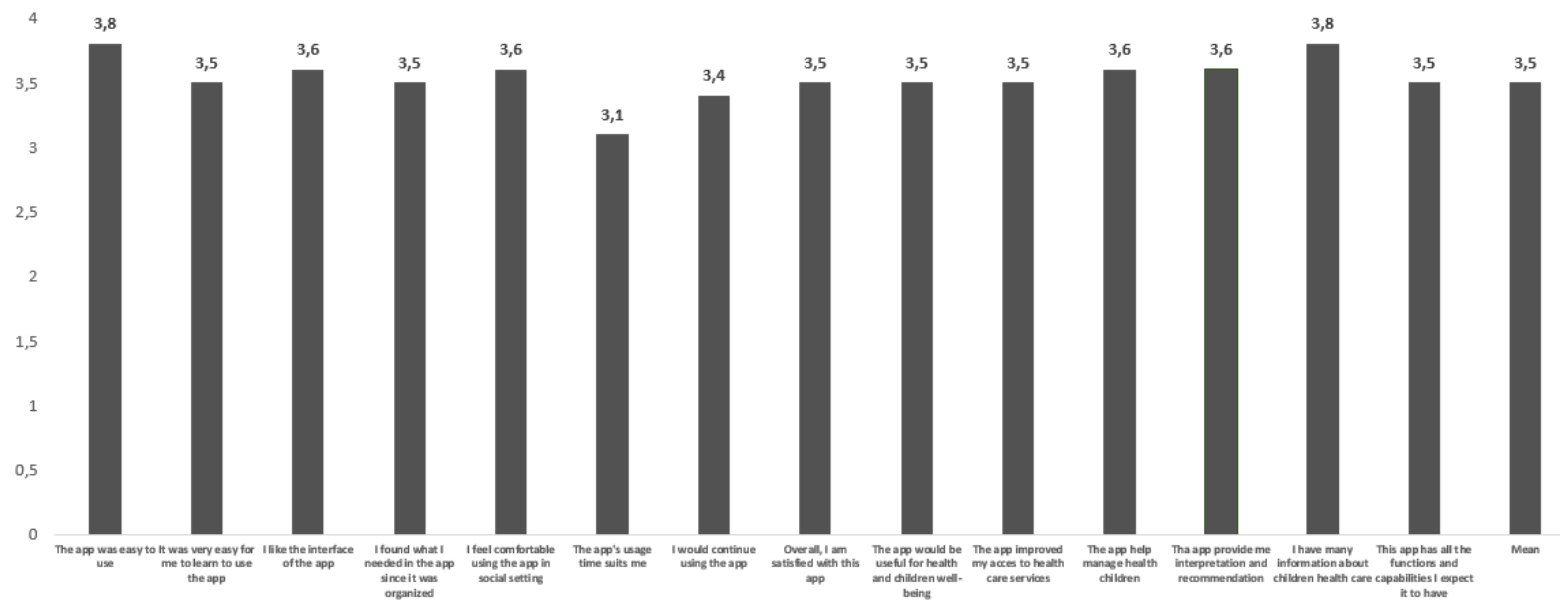
We performed means and standard deviations to analyze user satisfaction using STATA 15.

## 3. RESULTS AND DISCUSSION

The results indicated that all participant groups, including gender, education level, age,

**Table 1. Characteristics of Participants**

<b>Characteristics</b>	<b>n=100</b>
<b>Maternal age</b>	
<20 years	3
20-30 years	67
>31 years	30
<b>Maternal education</b>	
Yunior high school	3
Senior high school	89
University	8
<b>Paternal education</b>	
Junior high school	1
Senior high school	80
University	19
<b>Mother occupation</b>	
Early education teacher	21
Maternal children	20
Cadres	59
<b>Father occupation</b>	
Farmer/farm laborers	30
Self-employed	56
Civil servants	14
<b>Years of using android</b>	
5-10 years	27
>10 years	73



**Fig. 1. User Satisfaction Rating**

employment status, and occupation, were adequately represented. In total, 100 respondents completed the RASCH questionnaire after the intervention. Of these 100 respondents, 67% were 20–30 years old; the education levels of the mother and father were 89% and 80%, respectively; the participants roles as cadres were 56%; and the father's occupation was self-employed (59%). As detailed in Table 1.

Using the RASCH method with 14 criterias [19], we found that the mean score user satisfaction rating is  $3.5 \pm 1.5$ , as detailed in Fig 1.

The ease of use and the amount of information obtained through the application were experienced by the majority of participants, the mean ratings were  $3.8 \pm 1.2$  and  $3.8 \pm 1.5$  respectively. The satisfaction of m-health application was performed by previous studies in health failure in adult [20], children's well-being [21], and many m-health for all people [22]. Other components closely related to m-health satisfaction are ease of use, are ease of installation [23], facilitation for learning, privacy preservation [24], comfortable to use in everyday setting, and a friendly interface [21]. When associated with the characteristics of participants, the age of the user is fairly mature, aware of new technologies, and has a middle formal education level to support them in learning new things and then practicing them. This study also provides assistance in the context of using m-health applications during the research period, which strongly supports users recognition and implementation in everyday life. This is as suggested by previous research on maternal health support through the app [25].

Other sections of m-health acceptance in this research were: 1) the participants roles as cadres, early education teachers, and mothers of children encourage their interest in learning and using further applications; 2) m-health was tailored user-centered design [17], and it is also full considering sociocultural and behavioral user characteristics [26]. Identifying the predictors of willingness to utilize m-health is crucial for the development of m-health applications that can engage participants and promote sustained usage. his study reported that participants were willing to continue using the app and share it with others. Evaluation of psychological, attitude, and health-related correlates of m-health can reveal determinants of willingness to use m-health,

thereby influencing participants' utilization and long-term engagement with mobile health applications [27].

In terms of expediency, the adequacy of the information provided is a consideration of perceived usefulness [22,20,26]. In the mean rating, several aspects related to the adequacy of information of good value include benefits for the health and well-being of children, access to health services, interpretation and recommendations for improving health degrees, and parenting. The level of user satisfaction with this m-health system as a whole determines whether or not they will continue to use it over the long term [26].

The continuity of this intervention requires local government policy to support the adoption of DEPA 2.1 as an m-health application to support child health improvement programs as a complementary regular program. Another interesting thing is that the study was conducted in a suburban setting with adequate internet access. If the investigation had been carried out in a more remote location with limited access to the internet, the findings probably would have been different. However, the weakness of this research is that this survey was only conducted by ranking, so explanatory information about user satisfaction is not available.

#### **4. CONCLUSION**

This study, however, has both theoretical and practical consequences. Based on user satisfaction evaluation tests regarding ease of use, helpfulness, comfort, and accuracy of information, this application must be supported by policies so that it can be extensively used to support children's health programs.

#### **ETHICAL APPROVAL AND CONSENT**

The study was approved by the Regional Ethical Review Board, Poltekkes Kemenkes Yogyakarta No. e-KEPK/POLKESYO/0375/IV/2022, on April 5, 2022. All participants sign an informed consent form.

#### **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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