Original Research Article

Users' Satisfaction Levels about m-Health Applications in Growth and Development Children Monitoring in Yogyakarta, Indonesia

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 about m-health applications monitoring child growth and development in Indonesia.

Methods: This was a cross-sectional study conducted from May to November 2022 in DI Yogyakarta, Indonesia. The satisfaction survey was conducted on 100 respondents in DIY 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±1.5. The lowest rating is about the app's usage time suits me (3.1±1.4) and the highest rating is about the ease of use and I have many information about children health care (3.5±1.2 and 3.5±1.5 respectively).

Conclusion: the satisfaction levels of m-health application are good but effective decision-making is required to improve the m-health utilization wider.

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 blue print of 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 support ease access of health services for 270 million people in Indonesia both government and private health service sectors, increase preventive and promotive intervention, maintain patient safety, control patient health procedures, and even more economical health costs[1]. This transformation is an attempt to Resilience Towards 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 delivery of healthcare services such as Saudi Arabia[3], Yunani[4], Singapura[5], dan Malawi[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 is 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, allowed 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][13][14].

Many factors related to the sustainability of application use, such as system, design, quality, information, and user satisfaction which 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[6]. 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 children development accordance with SDIDTK program. We build m-health application namely DEPA 2.1 deserved for maternal children, cadres and health programmer accessible freely from play-store[17]. But how the 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 m-Health applications.

2.2. Measurement

The questionnaire assesses user satisfaction and other criteria. This study used the Rasch measurement theory[18]. Surveys have two sections both of demographic and satisfactions 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 agree. The question including 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 social setting, 6) The app's usage time suits me, 7) I would continue using the app, 8) Overall I am satisfied with this app, 9) The app would be useful for health and children well-being, 10) The app improved my access to health care services, 11) The app help manage health children, 12) The app provide me interpretation and recommendation, 13) I have many information about children health care, 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 accessed the effectivity 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 to maternal children using m-health applications either by assistance of researchers or not.

2.4. Statistical Analysis

We performed means and standard deviations to analysis user satisfactions using STATA 15.

2.5. Ethical consideration

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

3. RESULTS AND DISCUSSION

The results indicated that all participant groups, including gender, education level, age, 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, education level of mother and father were 89% and 80% respectively, participants role as cadres 56% and father occupation was self-**employed 59%. As detail depicted in Table 1.**

Table 1. Characteristics of participants

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

Using RASCH method with 14 criterias[19] we found that mean user satisfaction rating is 3.5±1.5, as detail in Table 2.

Table 2. Users perceptions of ease and satisfactions

Items	Mean ± SD
The app was easy to use	3.8 ± 1.2
It was very easy for me to learn to use the app	3.5 ± 1.1
I like the interface of the app	3.6 ± 1.3
I found what I needed in the app since it was organized	3.5 ± 2.1
I feel comfortable using the app in social setting	3.6 ± 2.1
The app's usage time suits me	3.1 ± 1.4
I would continue using the app	3.4 ± 1.6
Overall, I am satisfied with this app	3.5 ± 1.7
The app would be useful for health and children well-being	3.5 ± 1.3
The app improved my acces to health care services	3.5 ± 1.5

The app help manage health children	3.6 ± 1.4
Tha app provide me interpretation and recommendation	3.6 ± 1.6
I have many information about children health care	3.8 ± 1.5
This app has all the functions and capabilities I expect it to have	3.5 ± 1.4
Mean (total)	3.5 ± 1.5

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

Others section of m-health acceptance in this research were: 1) the participants role as cadres, early education teachers, and mothers of children encourages their interest in learning and using further applications both for their own children, student and toddlers who visiting Posyandu, 2) m-health was tailored user centered design [17], it is also full considering sociocultural and behavioral users 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. This study report that participants willinges to continue using the app and share it to others. Evaluation of psychological, attitude, and health-related correlates of m-health can reveal determinants of willingness to use m-health, hence 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]. 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, parenting. The level of user satisfaction with this m-health 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 complementary regular program. Another interesting thing is that the study was conducted in a sub-urban 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 of user satisfaction is not available.

4. CONCLUSION

This study, however, has both theoretical and practical consequences. The outcomes of this study would contribute to the healthcare literature in Indonesia and decision-makers in enhancing the usage of mHealth and adoption of eHealth technologies through effective decision-making.

REFERENCES

1. Ministry of Health of the Republic of Indonesia. Indonesia's path on digital health transformation puts on spotlight at Global Platform for Disaster Risk Reduction (GPDRR) 7 [Internet]. 29 June 2022. 2022 [cited 2022 Dec 22]. Available from: https://www.undp.org/indonesia/blog/indonesias-path-digital-health-transformation-puts-spotlight-gpdrr-7
2. Ministry of Health of Indonesia. Strategi Transformasi Digital Kesehatan 2024 Diluncurkan, Fokus ke Pelayanan Kesehatan bukan Pelaporan untuk Pejabat [Internet]. 16 December 2021. 2021

[cited 2022 Dec 22]. Available from: https://sehatnegeriku.kemkes.go.id/baca/rilis-media/20211216/5238996/strategi-transformasi-digital-kesehatan-2024-diluncurkan-fokus-ke-pelayanan-kesehatan-bukan-pelaporan-untuk-pejabat/
3. Santa R, MacDonald JB, Ferrer M. The role of trust in e-Government effectiveness, operational effectiveness and user satisfaction: Lessons from Saudi Arabia in e-G2B. Gov Inf Q [Internet]. 2019;36(1):39–50. Available from: https://www.sciencedirect.com/science/article/pii/S0740624X18300960
4. Kitsios F, Stefanakakis S, Kamariotou M, Dermentzoglou L. E-service Evaluation: User satisfaction measurement and implications in health sector. Comput Stand Interfaces [Internet]. 2019;63:16–26. Available from: https://www.sciencedirect.com/science/article/pii/S0920548918302022
5. Ng R. Cloud computing in singapore: Key drivers and recommendations for a smart nation. Polit Gov. 2018;6(4):39–47.
6. Chirambo GB, Muula AS, Thompson M. Factors affecting sustainability of mHealth decision support tools and mHealth technologies in Malawi. Informatics Med Unlocked [Internet]. 2019;17:100261. Available from: https://www.sciencedirect.com/science/article/pii/S2352914819302552
7. Insights. GD. DataReportal – Global Digital Insights. 2020. [Internet]. 2020 [cited 2022 Dec 28]. Available from: https://datareportal.com/reports/digital-2020-indonesia.
8. Puspitasari L, Ishii K. Digital divides and mobile Internet in Indonesia: Impact of smartphones. Telemat Informatics [Internet]. 2016;33(2):472–83. Available from: https://www.sciencedirect.com/science/article/pii/S0736585315001288
9. Octavius GS, Antonio F. Antecedents of Intention to Adopt Mobile Health (mHealth) Application and Its Impact on Intention to Recommend: An Evidence from Indonesian Customers. Colloc J, editor. Int J Telemed Appl [Internet]. 2021;2021:6698627. Available from: https://doi.org/10.1155/2021/6698627
10. Pusparisa Y. Indonesia Peringkat ke-3 Global Memanfaatkan Aplikasi Kesehatan [Internet]. 13/10/2020. 2020 [cited 2022 Dec 23]. Available from: https://databoks.katadata.co.id/datapublish/2020/10/13/indonesia-peringkat-ke-3-global-memanfaatkan-aplikasi-kesehatan
11. Davey S, Davey A, Singh JV. Mobile-health approach: A critical look on its capacity to augment health system of developing countries. Indian J Community Med. 2014;39(3):178–82.
12. McGarrigle L, Todd C. Promotion of physical activity in older people using mHealth and eHealth technologies: Rapid review of reviews. J Med Internet Res. 2020;22(12):1–10.
13. Wijesinghe MSD, Weerasinghe WPC, Gunawardana BMI, Rajapaksha RNU, Vithana V, Karunaratne S, et al. Revisiting health promotion settings: An innovative model from Sri Lanka to integrate healthy settings using mHealth. Heal Promot Perspect. 2022;12(1):28–33.
14. Lee M, Lee H, Kim Y, Kim J, Cho M, Jang J, et al. Mobile app-based health promotion programs: A systematic review of the literature. Int J Environ Res Public Health. 2018;15(12).
15. Er FZÖ& ?çlem. Determinants Of User Satisfaction With Mobile Applications: Case Of Facebook As A Mobile App In Turkey. In: Proceedings of Business and Management Conferences, International Institute of Social and Economic Sciences [Internet]. 2015. Available from: https://ideas.repec.org/p/sek/ibmpro/2304356.html
16. Angst CM, Agarwal R. Adoption of electronic health records in the presence of privacy concerns: The elaboration likelihood modeland individual persuasion. MIS Q Manag Inf Syst. 2009;33(2):339–70.
17. Siswati T, Widyawati HE, Rialihanto MP. The design of growth and development children ' s monitoring application : a user-centered approach. IJCMPH. 2022;9(12):1–6.
18. Melin J, Bonn SE, Pendrill L, Trolle Lagerros Y. A Questionnaire for Assessing User Satisfaction With Mobile Health Apps: Development Using Rasch Measurement Theory. JMIR Mhealth Uhealth [Internet]. 2020 May;8(5):e15909. Available from: http://www.ncbi.nlm.nih.gov/pubmed/32452817
19. Hoi VN. Understanding higher education learners' acceptance and use of mobile devices for language learning: A Rasch-based path modeling approach. Comput Educ [Internet]. 2020;146:103761. Available from: https://www.sciencedirect.com/science/article/pii/S0360131519303148
20. Cajita MI, Hodgson NA, Budhathoki C, Han H-R. Intention to Use mHealth in Older Adults With

Heart Failure. J Cardiovasc Nurs. 2017;32(6):E1–7.
21. Pramana G, Parmanto B, Kendall PC, Silk JS. The SmartCAT: An m-Health Platform for Ecological Momentary Intervention in Child Anxiety Treatment. Telemed e-Health [Internet]. 2014;20(5):419–27. Available from: https://doi.org/10.1089/tmj.2013.0214
22. Zhao Y, Ni Q, Zhou R. What factors influence the mobile health service adoption? A meta-analysis and the moderating role of age. Int J Inf Manage [Internet]. 2018;43:342–50. Available from: https://www.sciencedirect.com/science/article/pii/S0268401216308854
23. Hatamian M, Kitkowska A, Korunovska J, Kirrane S. "It's Shocking!": Analysing the Impact and Reactions to the A3: Android Apps Behaviour Analyser BT - Data and Applications Security and Privacy XXXII. In: Kerschbaum F, Paraboschi S, editors. Cham: Springer International Publishing; 2018. p. 198–215.
24. Shuwandy ML, Zaidan BB, Zaidan AA, Albahri AS, Alamoodi AH, Albahri OS, et al. mHealth Authentication Approach Based 3D Touchscreen and Microphone Sensors for Real-Time Remote Healthcare Monitoring System: Comprehensive Review, Open Issues and Methodological Aspects. Comput Sci Rev [Internet]. 2020;38:100300. Available from: https://www.sciencedirect.com/science/article/pii/S1574013720304007
25. Oppong E, Hinson RE, Adeola O, Muritala O, Kosiba JP. The effect of mobile health service quality on user satisfaction and continual usage. Total Qual Manag \& Bus Excell [Internet]. 2021;32(1–2):177–98. Available from: https://doi.org/10.1080/14783363.2018.1541734
26. Alanzi TM. Users' satisfaction levels about mHealth applications in post-Covid-19 times in Saudi Arabia. PLoS One [Internet]. 2022;17(5 May):1–11. Available from: http://dx.doi.org/10.1371/journal.pone.0267002
27. Sittig S, Hauff C, Graves RJ, Williams SG, McDermott RC, Fruh S, et al. Characteristics of and Factors Influencing College Nursing Students' Willingness to Utilize mHealth for Health Promotion. CIN - Comput Informatics Nurs. 2020;38(5):246–55.