Jurnal Manajemen Kesehatan Yayasan RS. Dr. Soetomo Vol.11 No.1 April 2025
Print ISSN 2477-0140 Online ISSN 2581-219X
www.jurnal.stikes-yrsds.ac.id

Evaluasi Penerimaan Prototipe Aplikasi Surveilans Gizi Anak Pra-Sekolah Menggunakan Model TAM

Evaluation of Acceptance of Pre-School Child Nutrition Surveillance Application Prototype Using the TAM Model

Fatria Harwanto[1*], **Danny Kusuma Aerosta**[2], **Muhammad Amin Arigo Saci**[3]
[1,2,3] Universitas Sriwijaya, Indonesia
(Email: fatriaharwanto@fkm.unsri.ac.id, Jl. Raya Palembang, Sumatera Selatan)

ABSTRAK

Pengawasan kesehatan dan gizi pada anak usia prasekolah sangat penting untuk mendukung pertumbuhan yang optimal, dan teknologi digital seperti aplikasi mobile dapat mempermudah pemantauan kesehatan gigi, gizi, dan riwayat imunisasi. Penelitian ini menganalisis penerimaan prototipe aplikasi pengawasan kesehatan dan gizi anak dengan menggunakan Technology Acceptance Model (TAM). Aplikasi ini diuji coba kepada 54 wali murid PAUD, dengan data yang dikumpulkan melalui kuesioner berbasis TAM yang menilai persepsi manfaat, persepsi kemudahan penggunaan, sikap terhadap penggunaan, dan niat untuk menggunakan aplikasi tersebut. Hasil penelitian menunjukkan bahwa sebagian besar wali murid memiliki persepsi positif terhadap kegunaan dan kemudahan penggunaan aplikasi, yang secara positif mempengaruhi sikap dan niat mereka untuk menggunakannya untuk pengawasan kesehatan anak. Prototipe aplikasi ini diterima dengan baik dan menunjukkan potensi sebagai alat yang efektif untuk pemantauan kesehatan anak prasekolah, meskipun penelitian lebih lanjut dalam skala yang lebih besar diperlukan untuk memvalidasi temuan ini.

Kata Kunci: Surveilans Kesehatan, Gizi, Model Penerimaan Teknologi, Anak Prasekolah

ABSTRACT

Health and nutrition surveillance in preschool-aged children is essential for supporting optimal growth, and digital technologies like mobile applications can simplify monitoring dental health, nutrition, and immunization history. This study analyzed the acceptance of a prototype child health and nutrition surveillance app using the Technology Acceptance Model (TAM). The app was tested with 54 preschool students' guardians, with data collected via a TAM-based questionnaire assessing perceived usefulness, perceived ease of use, attitude toward use, and intention to use the app. Results indicated that most guardians had positive perceptions of the app's usefulness and ease of use, which positively influenced their attitudes and intentions to use it for child health surveillance. The prototype was well-received and shows potential as an effective tool for preschool children's health monitoring, though further research on a larger scale is needed to validate these findings.

Keywords:Health Surveillance, Nutrition, Technology Acceptance Model, Preschool Children

INTRODUCTION

Globally, the Sustainable Development Goals (SDGs) have established 17 objectives to be achieved by 2030, with the second goal emphasizing the eradication of malnutrition (United Nations, 2015). Malnutrition encompasses addressing the nutritional needs of adolescent girls, pregnant women, and breastfeeding mothers, as well as combating issues like wasting and stunting in children under five. The Indonesian Ministry of Health (2014) defines stunting as a condition where a child's height is significantly below the age-appropriate standard (height-for-age Z score < -2 SD) (WHO, 2014).

Meanwhile, wasting, described by Ali & Nuryani (2018), is characterized by a weight significantly lower than the child's height, often referred to as underweight. Malnutrition adversely affects children's quality of life, hindering optimal growth and development, potentially leading to long-term developmental delays. UNICEF (2021) reported that one-third of children worldwide continue to experience malnutrition, stunting, wasting, or obesity due to poor dietary patterns. Child welfare is pivotal for achieving sustainable societal development, requiring a collective responsibility involving families, communities, and governments.

Indonesia's 2022 Basic Health Research (Riskesdas) reported a decline in stunting rates to 21.6%, yet further reductions are necessary to meet President Joko Widodo's 2024 target of 14% under the Indonesia Emas 2045 Program. Delayed child development can impact physical growth, cognitive abilities, and overall health, often resulting in lower academic performance and reduced earning potential in adulthood (Giri et al., 2018). Palembang, located in South Sumatra, comprises 18 districts and 41 public health centers, with a population of approximately 1.66 million in 2020 (BPS Palembang). The city's 2020 Health Office Profile reported malnutrition prevalence rates of 2.1% (underweight), 3.3% (stunting), and 1.9% (wasting). Early detection of stunting and wasting can be achieved through parental health monitoring of infants and young children. According to Lassi et al. (2013), parents play a critical role in ensuring proper nutrition, exclusive breastfeeding, and regular health checkups, including immunization. Therefore, an integrated, efficient approach involving parents, health professionals, and policymakers is essential for improving child welfare. Ardiaria, Subagyo, & Puruhita (2020) emphasized that child welfare research can significantly impact both community and policy levels by guiding parental practices, identifying vulnerable groups, and informing policy development. In the era of digital advancement, Android-based applications have become invaluable tools in health research, offering features like health data collection, monitoring, and educational

resources (Krebs & Duncan, 2015).

Despite numerous child nutrition apps, most fail to assist parents and authorities in early health monitoring, such as nutritional status, immunization, and disease history while lacking comparative data on children's ideal weight and height. This necessity inspired the development of the SEKANAK app, an Android-based child health surveillance tool designed to help parents monitor family health, particularly infants and toddlers. "SEKANAK," also meaning "family" in Palembang dialect, reflects the app's goal of enhancing child welfare. Its vision is to serve as a bridge between health workers and policymakers, facilitating data collection and policy formation to support the Indonesia Emas 2045 initiative.

METHODS

This study employed a descriptive-analytic approach by collecting quantitative data from guardians who tested the application. The method aimed to assess factors influencing technology acceptance using the Technology Acceptance Model (TAM). A total of 54 guardians of preschool-aged children participated in the study, where they engaged in a guided simulation of the prototype application and subsequently completed a TAM-based questionnaire. The instrument used was a TAM questionnaire consisting of four core components: Perceived Usefulness (PU), which evaluates the app's perceived benefit in supporting child health surveillance; Perceived Ease of Use (PEOU), assessing how easy the app is to operate; Attitude Toward Using (ATU), measuring guardians' attitudes toward using the app; and Behavioral Intention to Use (BIU), examining their intention to continue using the app in the future. Data were gathered through the distributed questionnaires post-application testing, with responses rated on a 5-point Likert scale ranging from strongly disagree to strongly agree (Joshi et al., 2015). The data were then descriptively presented to illustrate the distribution of guardians' perceptions across the four TAM components (Figure 1).

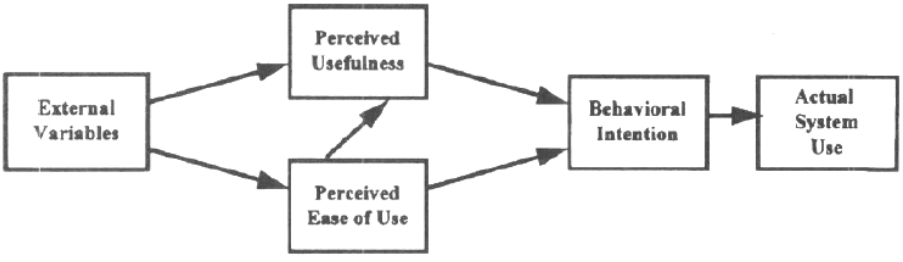

Figure 1. Research Flow Chart (Venkatesh & Davis, 1996)

Some of the activities in the SEKANAK application research series include training in child anthropometric measurements, self-reporting of child health checks, self-reporting of examination results by health workers, and the use of the SEKANAK application. Before and after these activities, data will be collected to be used as observation material in the process of developing the SEKANAK application. During this observation phase, an application acceptance analysis will be conducted using the TAM approach. This research has received a certificate of ethical clearance from the Ethics Commission of the Faculty of Public Health, Sriwijaya University Number 269/UN9.FKM/TU.KKK/2024.

RESULTS

The challenges and constraints encountered during the Sekanak application research process were the availability of technology support infrastructure; the SEKANAK application, like other digital platforms, requires an internet connection, which also depends on the available bandwidth. During the cadre training, it was quite difficult at first, but the video tutorials that had been prepared helped with the steps from downloading from the developer to operating directly.

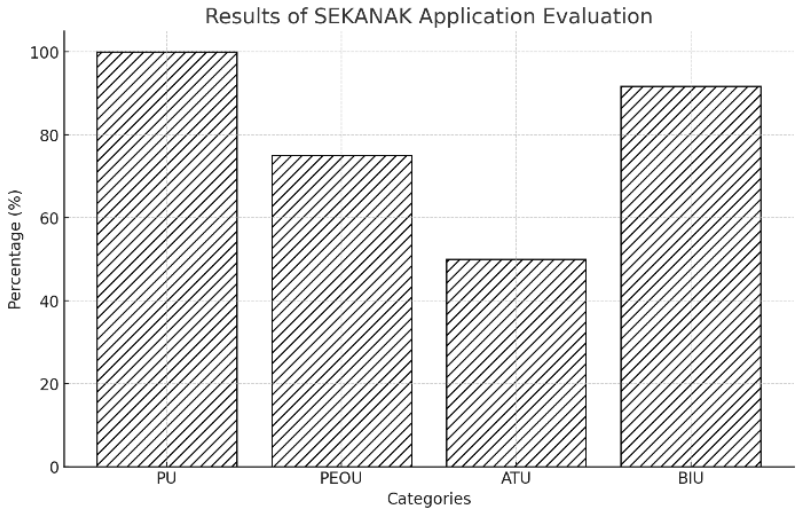

Figure 2 TAM Questionnaire Filling Results

While most existing health surveillance applications are paid, SEKANAK offers a distinct difference in its main features. The main features of SEKANAK include, firstly, data recording linked to the Population Registration Number (NIK), which aims to prevent duplication of data. Secondly, the application provides educational referrals tailored to the child's nutritional status, so that the information provided is more precise and accurate,

according to the actual condition of the child. The assessment of nutritional status in this application refers to anthropometric standards regulated in the Regulation of the Minister of Health of the Republic of Indonesia Number 2 of 2020 concerning Child Anthropometric Standards.

The findings of this study reveal an analysis of user acceptance of the SEKANAK application for child health surveillance, employing the Technology Acceptance Model (TAM) framework (Figure 2). All participants (100%) indicated that the SEKANAK application is highly beneficial for supporting child health monitoring, particularly in tracking nutritional status, immunization history, and dental health. Users perceived the application as providing tangible advantages, simplifying the process of monitoring children's health. The belief that the application offers significant utility strongly influenced user acceptance, aligning with previous research that emphasizes practical benefits as a crucial factor in the adoption of health technologies.

A majority of participants (75%) found the SEKANAK application easy to use, both in terms of its user interface and the features provided. Ease of use is a critical determinant in technology adoption, especially for users with diverse technological backgrounds. An intuitive design allows parents to monitor their children's health quickly and without technical difficulties, contributing positively to their intention to continue using the application. Half of the respondents (50%) demonstrated a positive attitude towards using the SEKANAK application, with this favorable perception closely linked to their intention for future use. Positive attitudes play a significant role in determining sustained adoption, as they are often associated with both the perceived usefulness and ease of use of the application.

An overwhelming 91.67% of participants expressed a strong intention to continue using the SEKANAK application as a tool for child health surveillance. This high level of intent reflects the users' perception of the application's value and ease of use, indicating its potential for broader acceptance among a larger user base. However, some participants who declined to take part in the study raised concerns about the privacy of their children's data, as the information would be managed by a third party. This highlights that despite the application's positive reception regarding usefulness and ease of use, data privacy remains a significant issue requiring careful attention and resolution.

DISCUSSION

Along with the rapid development of information technology, the health sector has

also felt the impact, including in terms of monitoring children's health. One example of the application of technology in this area is the SEKANAK application, which is designed to make it easier for parents to monitor children's health, especially in relation to nutritional status, immunization and dental health. Applications such as SEKANAK have great potential to improve the quality of child health management through more accurate and accessible data. However, to ensure effective adoption of these technologies, it is important to understand the factors that influence user acceptance of such applications.

This study aimed to explore user acceptance of the SEKANAK application, using the Technology Acceptance Model (TAM), a model often used to analyze technology acceptance in various sectors. The results revealed that all participants (100%) found the app very useful in supporting child health monitoring, particularly in tracking nutritional status, immunization history and dental health. Users felt that the app provided significant benefits, simplifying the process of monitoring children's health. This high perceived usefulness significantly influenced user acceptance, which is consistent with findings from previous studies that emphasize that practical benefits are a major factor in health technology adoption.

The results revealed an analysis of user acceptance of the SEKANAK application for child health surveillance, using the Technology Acceptance Model (TAM). All participants (100%) found the app very useful in supporting child health monitoring, particularly in tracking nutritional status, immunization history and dental health. Users perceived the app as providing significant benefits, simplifying the process of monitoring children's health. This high perceived usefulness significantly influenced user acceptance, in line with previous studies that emphasized practical benefits as a major factor in health technology adoption.

Most participants (75%) found the SEKANAK application easy to use, both in terms of the interface and the features available. Ease of use remains an important factor in technology adoption, especially when users have varying levels of technological skills. The intuitive design allows parents to quickly access their child's health information without significant technical difficulties. This finding is in line with TAM assumptions, where ease of use influences the intention to adopt technology. However, some participants reported challenges due to differences in smartphone operating systems, as the SEKANAK app was designed specifically for Android devices. For non-Android users, access via a web browser was required, which was perceived as less convenient.

Thus, it can be concluded that the results of this study indicate that the SEKANAK

application has a high level of acceptance among users to support child health monitoring. Based on analysis using the Technology Acceptance Model (TAM), all participants (100%) acknowledged that the app was very useful, particularly in tracking children's nutritional status, immunization history and dental health. This high perceived usefulness plays an important role in increasing user acceptance, in line with findings from previous studies that emphasize the importance of practical benefits in health technology adoption.

In addition, most participants (75%) found the SEKANAK application easy to use, both in terms of the interface and the features available. Ease of use is a very important factor in technology adoption, especially when users have varying levels of technological skills. The intuitive design of the app makes it easy for parents to access their child's health information quickly without significant technical difficulties, which is in line with the basic assumptions of TAM. However, it was found that some participants faced obstacles due to differences in smartphone operating systems, given that the SEKANAK app is specifically designed for Android devices. For users who do not use Android, they had to access the app through a web browser, which was less convenient.

This is in line with research conducted by Agus Mulyanto, Sumarsono, Thaqibul Fikri Niyartama, and Annisa Khodista Syaka (2024) who applied the Technology Acceptance Model (TAM) in testing the acceptance of the MasjidLink application. In that study, the results showed that perceived ease of use and perceived usefulness had a significant influence on application acceptance, similar to the findings in this study of the SEKANAK application for child health surveillance. Both studies emphasize the importance of ease of use and practical benefits as key factors in technology adoption, influencing users' desire to continue using the application. This also reinforces the argument that user acceptance of digital applications is strongly influenced by how well they meet their practical needs and the extent to which they are easy to access and use.

A positive attitude towards using the SEKANAK app was observed in half of the respondents (50%), which was closely related to their intention to continue using the app. This correlation supports the TAM framework, which emphasizes that positive attitudes towards technology significantly increase long-term adoption intentions. This positive outlook demonstrates the potential of the app to encourage continued parental involvement in child health monitoring.

A total of 91.67% of participants expressed a strong intention to continue using the SEKANAK app as a tool for child health surveillance. This high level of behavioral intention reflects perceptions of usefulness and ease of use, indicating the potential for the

app to be widely accepted. These findings are consistent with previous studies showing that user engagement is often dependent on perceived benefits and innovation.

Thus, it can be concluded that a positive attitude towards using the SEKANAK app was observed in half of the respondents (50%), which is closely related to their intention to continue using the app. This correlation supports the Technology Acceptance Model (TAM) framework, which emphasizes that positive attitudes towards technology significantly increase long-term adoption intentions. This positive outlook demonstrates the potential of the app to encourage continued parental involvement in child health monitoring. In addition, 91.67% of participants expressed a strong intention to continue using the SEKANAK app as a tool for child health surveillance, reflecting high perceived usefulness and ease of use and demonstrating the app's potential for widespread acceptance, in line with the findings of previous studies which emphasize that user engagement is dependent on perceived benefits and innovation.

This is in line with previous research conducted by Brigita Angga Wulan, Bambang Soedijono, and Henderi (2024) regarding the acceptance of the Bio Online System application using the Technology Acceptance Model (TAM) approach. The study found that perceived ease of use (PEOU) and perceived usefulness (PU) have a significant influence on application acceptance, which in turn affects users' intention to continue using the system. As with the SEKANAK application, these findings suggest that users are more likely to continue using the application if they perceive clear benefits and find the process easy to use. Positive attitudes towards technology, as found in their study, also reinforce ongoing adoption intentions.

However, this study also identified some limitations. With a sample size limited to 54 participants, the generalizability of these findings to a larger population remains limited. The small sample size may also affect the statistical power and reliability of the analysis. In addition, data collection was conducted over a short period of time, making it impossible to identify long-term usage patterns. Extending the trial period would provide deeper insights into the app's continued adoption. Furthermore, qualitative data regarding user experience and feedback on specific features was not collected. Such data could have provided valuable insights for design improvements and functional enhancements.

One of the concerns expressed by some non-participating respondents related to data privacy, particularly in relation to third-party management of child health data. This highlights the importance of addressing privacy issues, as it remains a critical barrier despite the app being well received in terms of usability and ease of use.

This study also has some limitations that need to be noted. First, the sample size of only 54 participants limits the ability to generalize the findings to a wider population. A small sample size has the potential to affect the reliability of statistical analysis, so the results obtained may not fully illustrate the trends that exist in the community at large. In addition, the short period of data collection prevented researchers from analyzing long-term usage patterns. By extending the duration of the experiment, it would be easier to evaluate app adoption over a longer period of time and assess the factors that influence app usage on an ongoing basis.

In addition, this study did not collect qualitative data that could provide a deeper understanding of the user experience and their feedback on the app's features. Qualitative data collection can reveal the strengths and weaknesses of the app from the user's perspective that may not be detected in quantitative analysis alone. Some respondents who did not take part in the study also raised concerns regarding privacy issues, especially about third-party management of child health data. This suggests that while the app was well received in terms of ease of use and usability, privacy concerns remain an important barrier that must be addressed to ensure user trust and comfort in the long-term use of the app.

CONCLUSION

This prototype digital-based child health surveillance application has great potential to be accepted and used by guardians in monitoring the health of pre-school children. Usability factors and ease of use of the app play an important role in increasing user acceptance, as well as making data management improvements that ensure the security of user data. Further research is recommended to test this app in a wider population and with a longer trial period so that the results can be more widely generalized.

DAFTAR PUSTAKA

Ali, R., & Nuryani, N. (2018). Sosial ekonomi, konsumsi fast food dan riwayat obesitas sebagai faktor risiko obesitas remaja. *Media Gizi Indonesia, 13*(2), 123-132. https://doi.org/10.20473/mgi.v13i2.123-132

AP, A. (2021). *Sistem informasi kesehatan (Kajian Covid-19 melalui sistem informasi kesehatan).* Deepublish (Grup Penerbit CV Budi Utama).

Ardiaria, M., Subagyo, H. W., & Puruhita, N. (2020). Sosialisasi prinsip dan pesan gizi seimbang sebagai pengganti program empat sehat lima sempurna. *JNH (Journal of Nutrition and Health, 8*(1), 51-56.

Ari, P., & Reni, S. D. (2022). Pengaruh persepsi kemudahan dan persepsi kemanfaatan terhadap minat penggunaan aplikasi Alodokter selama pandemi Covid-19.

Case, A., Lubotsky, D., & Paxson, C. (2002). Economic status and health in childhood: The origins of the gradient. *American Economic Review, 92*(5), 1308-1334.

Centers for Disease Control and Prevention (CDC). (2020). *Principles of epidemiology in public health practice, third edition: An introduction to applied epidemiology and biostatistics*.

Davis, F. D. (1986). *A technology acceptance model for empirically testing new end-user information systems: Theory and results* (Doctoral dissertation, Massachusetts Institute of Technology).

Gianfredi, V., Moretti, M., Lopalco, P. L., & Countinho, C. (2019). The role of digital surveillance for informing public health interventions in the 21st century. *Frontiers in Public Health, 7*, 34. https://doi.org/10.3389/fpubh.2019.00034

Hargono, A. (2013). Aplikasi surveilans epidemiologi penyakit potensial wabah pada anak sekolah menggunakan Epi Info. *Proceeding, Forum Informatika Kesehatan Indonesia, Semarang.*

Ikhsan, M. (2020). Aplikasi monitoring kesehatan balita melalui e-Posyandu berbasis hybrid programming. *Kumpulan Karya Ilmiah Mahasiswa Fakultas Sains dan Teknologi, 2*(2), 185.

Iskandar, H. M. (2024). Analisis komunikasi pasien dengan dokter pada aplikasi konsultasi kesehatan berbasis artificial intelligence Aicare. *Jurnal Pariwara, 4*(1), 9-19.

Iswarawanti, D. N. (2010). Kader posyandu: Peranan dan tantangan pemberdayaannya dalam usaha peningkatan gizi anak di Indonesia. *Jurnal Manajemen Pelayanan Kesehatan, 13*(4), 169-173.

Joshi, A., Kale, S., Chandel, S., & Pal, D. K. (2015). Likert scale: Explored and explained. *British Journal of Applied Science & Technology, 7*(4), 396-403.

Kementerian Kesehatan Republik Indonesia. (2017). *Buku saku pemantauan status gizi tahun 2017.*

Kementerian Kesehatan Republik Indonesia. (2020). *Peraturan Menteri Kesehatan Republik Indonesia Nomor 2 Tahun 2020 tentang Standar Antropometri Anak.*

Krebs, P., & Duncan, D. T. (2015). Health app use among US mobile phone owners: A national survey. *JMIR mHealth and uHealth, 3*(4), e101.

Laranjo, L., Dunn, A. G., & Coiera, E. (2018). Conversational agents in healthcare: A systematic review. *Journal of the American Medical Informatics Association, 25*(9), 1248-1258.

Lassi, Z. S., Das, J. K., Zahid, G., Imdad, A., & Bhutta, Z. A. (2013). Impact of education and provision of complementary feeding on growth and morbidity in children less than 2 years of age in developing countries: A systematic review. *BMC Public Health, 13*(S3), S13.

Maddah, N., Verma, A., Almashmoum, M., & Ainsworth, J. (2023). Effectiveness of public health digital surveillance systems for infectious disease prevention and control at mass gatherings: Systematic review. *J Med Internet Res, 25*, e44649. https://doi.org/10.2196/44649

Menzies, R. I., Turnour, C. E., & Chiu, C. (2015). Vaccine-preventable diseases and vaccination coverage in Aboriginal and Torres Strait Islander people, Australia. *Communicable Diseases Intelligence Quarterly Report, 39*(3), E346-E35.

Modul Pelatihan Surveilans Epidemiologi bagi Petugas Puskesmas. (2018). Pusat Pelatihan SDM Kesehatan, Kemenkes RI.

Oh, M. D., Choe, P. G., Kim, J. H., & Park, W. B. (2016). Acute infectious disease surveillance in Korea. *Epidemiology and Health, 38*, e2016054.

Pedoman Pemeliharaan Kesehatan Gigi dan Mulut Ibu Hamil dan Anak Usia Balita bagi Tenaga Kesehatan di Fasilitas Pelayanan Kesehatan. (2012). Kementerian Kesehatan RI.

Profil Dinas Kesehatan Kota Palembang. (2020). *Laporan Profil Kesehatan 2020*. https://dinkes.palembang.go.id/program

Pusat Data dan Informasi Kementerian Kesehatan RI. (2022). *Situasi balita pendek (stunting) di Indonesia: Buletin Jendela Data dan Informasi Kesehatan.*

Putri, C. A., Yahya, E. S., & Kania, R. (2021). Sikap dan niat perilaku generasi milenial dalam adopsi platform telemedicine untuk layanan konsultasi kesehatan mental. *Prosiding Industrial Research Workshop and National Seminar, 12*, 1073-1080.

Rahayu, R. M., Sari, I., & Pratiwi, D. (2018). The biopsychosocial determinants of stunting and wasting in children aged 12-48 months. *J Matern Child Health*.

Salim, M. F., Syairaji, M., Ningtyas, A. M., & Pratama, R. A. (2022). Pengembangan sistem informasi surveilans program kesehatan ibu dan anak berbasis DHIS2 (District Health Information Software 2). *Care: Jurnal Ilmiah Ilmu Kesehatan, 10*(2), 267-276.

Sufa, F. F., Sutarwan, H. A., Safitri, N. N., Kusuma, R. M., Weni, P. W. P., Amelia, T., Setiawan, A., & Rachmadany, H. (2023). *Mengenal deteksi tumbuh kembang anak usia dini.* Unisri Press.

Sumantri, E., & Maulana, Y. (2024). Penerimaan teknologi kesehatan masyarakat ALODOKTER menggunakan metode Technology Acceptance Model (TAM). *INTECOMS: Journal of Information Technology and Computer Science, 7*(1), 227-236.

Susanti, A. I., & Hasan, A. (2020). Persepsi petugas gizi dalam pemantauan status gizi balita dengan menggunakan website IPOSYANDU. *Kebidanan, 6*(3), 376-382.

UNICEF. (2021). *State of the world's children 2021: On my mind.*

United Nations. (2015). Sustainable Development Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture. *United Nations.*

World Health Organization. (2014). WHA Global Nutrition Targets 2025: Stunting Policy Brief. *World Health Organization.*

Submission	January 15, 2025
Review	February 18, 2025
Accepted	May 15, 2025
Publish	May 30, 2025
DOI	10.29241/jmk.v11i1.2180
Sinta Level	3 (Third)
JMK Yayasan RS Dr. Soetomo	Jurnal Manajemen Kesehatan Yayasan RS.Dr.Soetomo p-ISSN 2477-0140, e-ISSN 2581-219X, Volume 11 No.1 2025, DOI: 10.29241/jmk.v11i1.2180 Published by STIKES Yayasan RS.Dr.Soetomo.
	Copyright (c) 2024 Fatria Harwanto etc. This is an Open Access (OA)article under the CC BY 4.0 International License (https://creativecommons.org/licenses/by-sa/4.0/).