The impact of integrating the ISO/IEC 25010 standard into the "PSG Balita" on the quality of the toddler nutritional status report data
Dampak penerapan "PSG Balita" berstandar ISO/IEC 25010 terhadap kualitas data laporan status gizi balita

Agus Hendra Al Rahmad[1*], Junaidi[2], Nunung Sri Muliyani[4], Emilda[5]

[1] Department of Nutrition, Poltekkes Kemenkes Aceh, Aceh, Indonesia.
E-mail: 4605.ah@gmail.com
[2] Department of Nutrition, Poltekkes Kemenkes Aceh, Aceh, Indonesia.
E-mail: junaidineidi@gmail.com
[3] Department of Nutrition, Poltekkes Kemenkes Aceh, Aceh, Indonesia.
E-mail: nunungmulyani76@gmail.com
[4] Department of Midwifery, Poltekkes Kemenkes Aceh, Aceh, Indonesia.
E-mail: emilda@poltekkesaceh.ac.id

*Correspondence Author:
Department of Nutrition, Poltekkes Kemenkes Aceh, Soekarno-Hatta Street, Kampus Terpadu Poltekkes Aceh, Lampeuneurut, Aceh Besar 23352, Aceh, Indonesia..
E-mail: 4605.ah@gmail.com

Abstract

Utilizing Android-based Information Communication Technology (ICT) is pivotal in the healthcare sector for monitoring the growth, development, and assessment of nutritional status and ensuring enhanced data quality for toddlers. The adherence to ISO/IEC 25010 standards is imperative in developing high-quality applications like "PSG Balita." This study aimed to assess the impact of the "PSG Balita" Android application, which complies with the ISO/IEC 25010 standard, on the accuracy of nutritional status data for toddlers. In 2021, a quasi-experimental design research was conducted in Banda Aceh City, with the participation of 30 nutritionists from health facilities. The data were gathered by observations and interviews, utilizing a questionnaire that assessed the aspects of timeliness, completeness, accuracy, and usefulness. The intervention involved a one-month training session utilizing the "PSG Balita" software, which is consistent with the ISO/IEC 25010 standard. Data analysis utilizing repeated-measures ANOVA indicated that the "PSG Balita" application conformed to IEC standards, demonstrating a data quality score of 82,5. The intervention greatly improved the quality of data on the nutritional condition of children under the age of five ($p < 0,05$). In conclusion, the "PSG Balita" application, which is based on Android and adheres to ISO/IEC 25010 standards, can improve the precision of nutritional status data for toddlers, assessed in terms of timeliness, completeness, accuracy, and usefulness.

Keywords: Data quality, ISO/IEC 25010, nutrition information, nutrition App

Abstrak

Penggunaan teknologi dan informasi komunikasi (TIK) berbasi android dalam bidang kesehatan sangat penting untuk melakukan pemantauan tumbuh kembang serta penilaian status gizi. Hal tersebut akan mendukung kualitas data status gizi balita. Standar ISO/IEC 25010 sangat penting dalam menghasilkan aplikasi PSG Balita yang berkualitas. Tujuan penelitian ini adalah untuk menilai dampak penerapan aplikasi "PSG Balita" berbasis Android yang mematuhi standar ISO/IEC 25010 terhadap akurasi data status gizi balita. Penelitian ini mengadopsi desain Quasi Eksperimental dan dilaksanakan di Kota Banda Aceh pada tahun 2021, melibatkan partisipasi dari 30 tenaga gizi di Puskesmas. Proses pengumpulan data dilakukan melalui serangkaian wawancara dan observasi dengan menggunakan kuesioner yang mencakup penilaian terhadap aspek-aspek keteraturan waktu, kelengkapan data, tingkat keakuratan, serta manfaat yang dihasilkan. Intervensi dilakukan melalui pelatihan menggunakan aplikasi PSG Balita yang telah memenuhi standar ISO/IEC 25010 selama satu bulan. Analisis data menggunakan uji *Repeated Measures ANOVA*. Hasil, aplikasi PSG Balita yang telah sesuai dengan standar ISO/IEC, dengan kualitas data sebesar 82,5. Secara signifikan, intervensi ini berhasil meningkatkan kualitas data status gizi balita di bawah lima tahun ($p < 0,05$). Sebagai kesimpulan, aplikasi "PSG Balita" berbasis Android yang mematuhi standar ISO/IEC 25010 menunjukkan potensi untuk meningkatkan akurasi data status gizi balita.

Kata Kunci: Aplikasi gizi, ISO/IEC 25010, informasi gizi, kualitas data

Introduction

Nutrition plays a crucial role in the growth and development of children, and the repercussions of malnutrition on their health and overall well-being are well-documented (Deoni et al., 2018). The issue of infant nutrition is particularly severe globally, especially in developing nations like Indonesia (Huriah & Nurjannah, 2020). World Health Organization (WHO) data from 2020 reveals that around 149 million children below the age of five suffered from stunted growth or chronic malnutrition, with Indonesia ranking among the countries with the highest stunting rates worldwide (WHO, 2020).

In 2018, the National Health Survey (*RISKESDAS*) data indicated that Indonesia faced significant challenges, with a prevalence of malnutrition or wasting at 10,2%, underweight at 17,7%, overweight at 8,0%, and stunting at 30,8% in children under five (Kemenkes RI, 2018). Subsequent National Nutrition Survey in Indoneisa (*SSGI*) data from 2022 reported a decrease in stunting to 21,6%, a slight increase in wasting to 7,7%, a marginal decrease in underweight to 17,1%, and a reduction in overweight to 3,5% (Kemenkes RI, 2022). Conversely, Aceh Province continued to face nutritional challenges in 2022, with a high stunting rate of 31,2%, making it the fifth most affected province. Wasting was prevalent at 11,3%, underweight at 24,3%, and overweight at a modest 1,9% (Kemenkes RI, 2022).

Despite concerted efforts by central and local governments and the community to address undernutrition, particularly in Aceh Province, the problem persists. The ICT has been leveraged in the health sector to enhance service quality and provide the public with accurate health information (Dash et al., 2019). An example is the use of an Android application, such as the "PSG Balita," designed to monitor growth, development, and nutritional status (Utomo et al., 2021; Srivastava et al., 2022; Al Rahmad et al., 2022).

However, in Indonesia, under-five nutrition is still a problem that has to be handled. Consequently, there is a need for comprehensive research to assess the efficacy of the "PSG Balita" application in improving the accuracy of nutritional status data for young children. Prior research has investigated the effects of ICT-based health apps on the quality of healthcare. However, no studies have explicitly analyzed the impact of implementing ISO/IEC 25010 standard applications on the accuracy and reliability of data related to the nutritional status of toddlers.

A prior initiative resulted in the development of the "PSG Balita" application, which aids nutrition workers in Puskesmas by facilitating data reporting on indicators such as WFA, HFA, LFA, WFH, and BFA for toddlers (Al Rahmad et al., 2022). The application adheres to ISO/IEC 25010 standards, demonstrating functional capability and meeting quality tests (Al Rahmad et al., 2021). This study aims to evaluate the impact of the Android-based "PSG Balita" App, matched with ISO/IEC 25010 standards, on the accuracy of nutritional status data for children in Banda Aceh City, with an emphasis on enhancing the ability of nutritionists and policymakers to make decisions regarding regional nutritional challenges.

Methods

The investigation employed a quasi-experimental design featuring a pretest-posttest design methodology to assess variables within the same cohort both before and after an intervention. The study was conducted over a 5-month period, spanning from June to October 2021, in Banda Aceh City, Aceh Province.

The participants consisted of Nutrition Implementation Staff operating within the jurisdiction of the Banda Aceh City Health Office. The determination of the sample size was carried out utilizing equations suitable for testing a two-sided hypothesis for an average population, as outlined by Sharma et al. (2020):

$$n = \frac{\sigma^2 (Z_{1-\alpha/2} + Z_{1-\beta})^2}{(\mu_o - \mu_a)^2}$$

Subsequently, 30 nutritional workers were included in the study through purposive sampling, with inclusion criteria mandating a minimum educational qualification of Diploma-III in Nutrition, actively fulfilling the role of a nutrition manager at both the Health Center and the Health Office, and demonstrating a commitment to actively engage until the research is completed.

The "PSG Balita" App was developed using the waterfall model process, which involves several phases such as system requirements, application design and implementation, and application assessment. The prototype was subjected to rigorous evaluation, including expert testing with a success rate of 78,0% and user testing with a success rate of 82,5%. The evaluation, based on ISO/IEC 25010 standards, confirmed compliance. To enhance data robustness, this study adopted a qualitative approach, employing triangulation to compare interview and observation data for consistency, completeness, and certainty.

Given the study's objective of assessing nutritional status data for toddlers in terms of timeliness, completeness of filling, accuracy, and usefulness, a quantitative approach was deemed essential. Data collection methods encompassed focus group discussions (FGD) and direct interviews, utilizing a 30-item questionnaire with validated and reliable questions pertaining to timeliness, completeness, accuracy, and usefulness. Subsequent quantitative data processing involved stages such as editing, coding, computer data entry, and data entry cleaning.

The analysis incorporated data reduction, inference testing, data display, and concluding plotting and validation. R statistical software, an open-source tool, facilitated the examination of data that demonstrated normal distribution ($p > 0,05$) based on the Shapiro-Wilk test. Consequently, a repeated-measures ANOVA at a 95% confidence interval was employed for analysis. Furthermore, the study underwent ethical review by the Health Research Ethics Commission (HREC) at the Institute of the Poltekkes Kemenkes Aceh, under the reference number LB.02.03/014/2021.

Result and Discussion

The study was carried out in 11 public health facilities within the jurisdiction of the Banda Aceh City Health Office. All of these health centers were included in the analytic unit, and a total of 30 participants were recruited for the study. One nutritionist from the provincial health office, one nutritionist (coordinator) from the health office, a team of experts from the Department of Nutrition, Poltekkes Kemenkes Aceh (three people), a team of technology and information experts (three people), and two people each from the Public Health Center (there are 11 health centers in Banda Aceh City) as nutritionists. The characteristics of the study participants are shown in Figure 1, including age, sex, education, and training
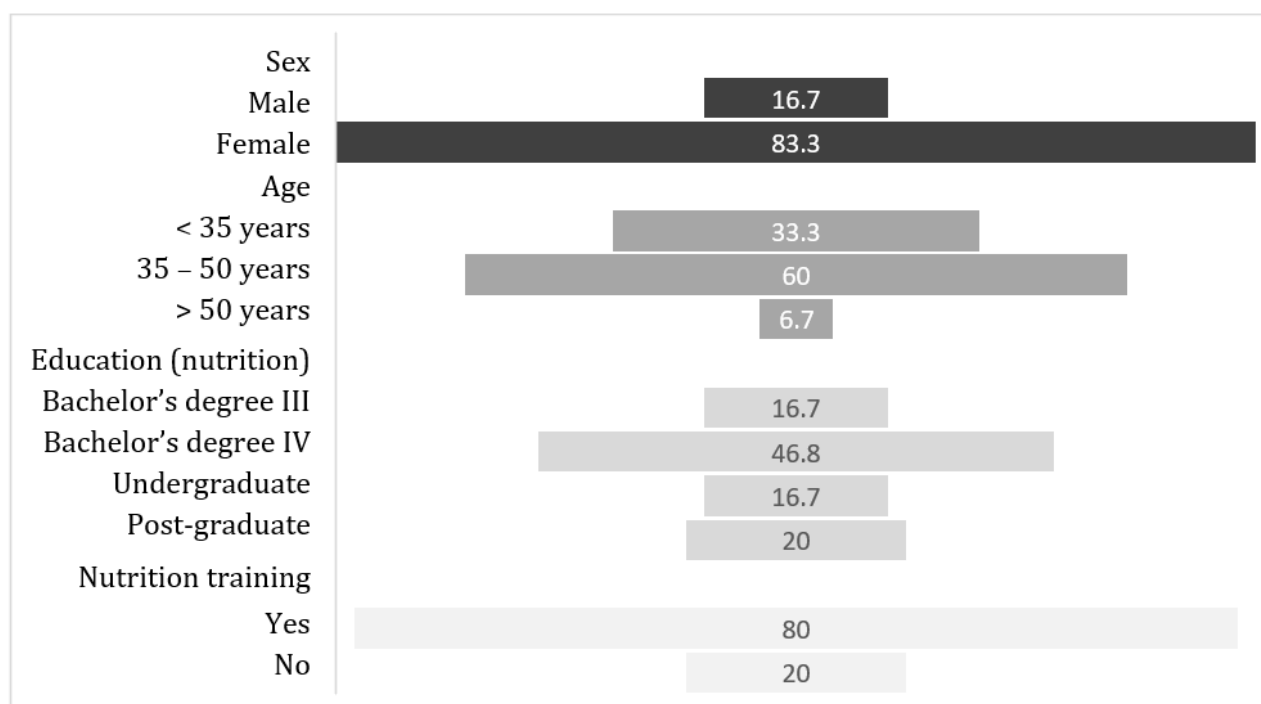
Figure 1. Characteristics of the sample (n = 30)

The results of the study were related to the characteristics of the sample (Figure 1), showing that the overall age of the respondents was between 35 and 50 years (60,0%) and female (83,3%). Meanwhile, according to their educational background, they generally completed D-IV nutrition education or related fields, which is 46,8%, and almost all (80,0%)

respondents in this study attended nutrition training.

The implementation of the "PSG Balita" App, which has been standardized by ISO/IEC 25010, shows good achievements in improving the quality of nutritional data during one month, especially in terms of timeliness, completeness, accuracy, and usefulness.

Table 2. The impact of the "PSG Balita" application, compliant with ISO/IEC 25010 standards, on the accuracy and reliability of nutritional status data

Quality of Nutritional Status Data	Application of PSG Application for Toddlers ISO/IEC 25010 Standard			
	Beginning - Week 2		Week 3 - Week 4	
	Δ Average +Deviation	P-Value	Δ Average + Deviation	P-Value
Timeliness	2,3 ± 5,49	0,083*	18,5 ± 8,13	0,000
Completeness	11,0 ± 5,98	0,000	22,0 ± 4,10	0,000
Accuracy	12,3 ± 7,86	0,001	7,5 ± 4,44	0,001
Usefulness	2,3 ± 3,02	0,004	6,3 ± 5,82	0,002

Δ= value difference; *Not significant (p > 0,05)

The findings from the investigation, as delineated in Table 2, reveal that the Toddler PSG Application, aligned with the ISO/IEC 25010 standard, exerts a favorable influence on the quality of nutritional status data concerning toddlers across various dimensions. Primarily, there was a discernible enhancement in punctuality during the second week, although statistical significance was not attained (p=0.082). Subsequently, a noteworthy and statistically significant improvement was observed during weeks 3 to 4 (p=0,000), signifying that the Toddler PSG Application, in adherence to ISO/IEC 25010 standards, has elevated the promptness in collecting data pertaining to the nutritional status of toddlers.

Secondly, in relation to completeness, a substantial improvement manifested during the second week (p=0,000). This enhancement persisted from weeks 3 to 4, with an average positive deviation, reaching statistical significance (p=0,000). The integration of the Toddler PSG Application, guided by ISO/IEC 25010 standards, has thus heightened the completeness of nutritional status data for toddlers.

Thirdly, concerning accuracy, a significant improvement was observed during the second week (p=0,001). Nevertheless, there was a little decrease in weeks 3 to 4, with an average difference of 7,5 ± 4,44 and a p-value of 0,001. However, the deployment of the child PSG

Application in accordance with ISO/IEC 25010 standards effectively enhanced the precision of child nutritional status data.

Fourthly, with regard to usefulness, a noteworthy improvement was evident as early as the second week (p=0,004). Substantial enhancements persisted during weeks 3 to 4 (p=0,002), affirming that the adoption of the ISO/IEC 25010 "PSG Balita" App significantly augmented the utility of collecting nutritional status data on toddlers. Based on the results shown in Table 2, it can be inferred that the usage of the ISO/IEC 25010 "PSG Balita" App has had a beneficial impact on the quality of nutritional status data for toddlers. This is particularly evident in the four aspects of quality.

This investigation has demonstrated that the implementation of the "PSG Balita" App in accordance with ISO/IEC 25010 standards has a positive impact on enhancing the quality of nutritional status data for toddlers, particularly with respect to timeliness, completeness, accuracy, and usefulness. This finding resonates with previous research indicating that the integration of information technology can contribute to the improvement of data quality and operational efficiency in health data collection.

Consistent with the existing literature, our results align with studies affirming that the utilization of information technology can elevate

the quality of health data (Salameh et al., 2019). Moreover, broader evidence suggests that the incorporation of information technology in the health sector has the potential to enhance efficiency, accuracy, and user satisfaction (Wang et al., 2019). Mobile applications, as evidenced by Win et al. (2020), have been shown to improve data quality and enhance the work efficiency of health workers in the context of health data collection. Corsi et al. (2017) also demonstrated that the application of information technology in nutritional data collection can lead to improved data quality and a reduction in data collection errors.

The "PSG Balita" App, developed according to ISO/IEC 25010 standards, enhances the quality of nutritional status data for toddlers by streamlining data administration, reducing data entry mistakes, and speeding up data processing and reporting. Prior studies emphasize that the integration of information technology in health data management may improve the precision and efficiency of data processing (Wang et al., 2019). By employing the ISO/IEC 25010 standard as a reference point, the assessment of the "PSG Balita" App guarantees adherence to quality standards.

Nevertheless, it is imperative to acknowledge challenges associated with the application of issues pertaining to information technology in health data management include issues around data security and privacy, a lack of proficiency in information technology skills among healthcare professionals, and the accompanying high expenses of using advanced technology (Sittig & Singh, 2015). In the health context, the utilization of the Toddler PSG application with ISO/IEC 25010 standards is instrumental in guaranteeing the accuracy, completeness, and utility of nutritional status data collected from toddlers, thereby supporting analytical assessments and interventions to enhance the quality of children's health services at the community level.

In Indonesia, where malnutrition prevalence remains high, particularly in terms of stunting (21,6%), underweight (17,1%), and wasting (7,7%), the significance of improving the quality of nutritional status data on toddlers, as highlighted by Kemenkes RI (2022), cannot be overstated. It is imperative for nutrition workers at Health Centers to optimize their roles through effective utilization of technology.

Training programs, specifically tailored to technology and information applications, are crucial. Such training not only aims to provide the latest insights into nutritional status monitoring applications but also seeks to enhance work commitment among individual nutritionists at the Health Center (Al Rahmad & Junaidi, 2020).

The application of ISO/IEC 25010 standard "PSG Balita" applications offers several advantages, including facilitating more precise and structured data collection. This application allows users, including nutritionists, to expedite the gathering of information concerning the nutritional condition of toddlers. Notably, the PSG Toddler application is equipped with features such as data validation, user-friendly data display, and data entry capabilities using Android-formatted mobile phones, thereby minimizing manual data collection errors (Al Rahmad et al., 2022).

Despite these valuable insights, it is essential to acknowledge the limitations identified in this study. The subjects were confined to a single group in Banda Aceh City, potentially limiting the generalizability of the findings to nutrition workers in Aceh Province. Additionally, the application period was limited to one month, raising considerations about the sustainability of nutritionists' use of the application over an extended timeframe. These limitations underscore the need for cautious interpretation and consideration of the study's scope and duration in future endeavors.

Conclusion

In conclusion, the implementation of the standardized "PSG Balita" App in accordance with ISO/IEC 25010 has demonstrated a positive impact on enhancing the evaluation of the nutritional status data for toddlers in Banda Aceh City. Notably, improvements were observed in the critical dimensions of timeliness, completeness, accuracy, and usefulness.

Based on these findings, it is recommended to promote the widespread adoption of the "PSG Balita" App as a pivotal tool for advancing the quality of nutritional status data for toddlers across Aceh Province. This advocacy can be effectively achieved through targeted socialization efforts and comprehensive training programs tailored for nutrition workers

and Integrated Healthcare Center cadres at the village or community level. Furthermore, it is advised to fortify the monitoring and evaluation processes of the toddler nutrition status monitoring program across all regions of Aceh Province. This enhancement should encompass the incorporation of data quality indicators as integral evaluation variables, thereby contributing to heightened accuracy and validity in the collection of nutritional status data.

References

Al Rahmad, A. H., & Junaidi, J. (2020). Pemanfaatan aplikasi standar pertumbuhan WHO 2005 berbasis smartphone android (PSG Balita) terhadap kualitas data gizi. *Jurnal Kesehatan*, *11*(1), 10–18. https://doi.org/10.26630/jk.v11i1.1872

Al Rahmad, A. H., Junaidi, J., Fitrianingsih, E., Iskandar, I., Mulyani, N. S., Irwandi, I., Arnisam, A., Khazanah, W., Andriani, A., & Alfridsyah, A. (2022). Effectiveness of using Android-based applications for nutrition monitoring of toddlers in Banda Aceh. *Open Access Macedonian Journal of Medical Sciences*, *10*(E), 444–451. https://doi.org/10.3889/oamjms.2022.7599

Al Rahmad, A. H., Junaidi, & Mulyani, N. S. (2021). Analisis Kualitas Aplikasi PSG Balita pada Platform Android Berdasarkan Standar ISO/IEC 25010. In *Politeknik Kesehatan Kemenkes Aceh*.

Corsi, D. J., Perkins, J. M., & Subramanian, S. V. (2017). Child anthropometry data quality from Demographic and Health Surveys, Multiple Indicator Cluster Surveys, and National Nutrition Surveys in the West Central Africa region: are we comparing apples and oranges? *Global Health Action*, *10*(1), 1328185. https://doi.org/10.1080/16549716.2017.1328185

Dash, S., Shakyawar, S. K., Sharma, M., & Kaushik, S. (2019). Big data in healthcare: management, analysis and future prospects. *Journal of Big Data*, *6*(1), 54. https://doi.org/10.1186/s40537-019-0217-0

Deoni, S., Dean, D., Joelson, S., O'Regan, J., & Schneider, N. (2018). Early nutrition influences developmental myelination and cognition in infants and young children. *NeuroImage*, *178*, 649–659. https://doi.org/10.1016/j.neuroimage.2017.12.056

Fitri, M. O. (2018). Aplikasi Monitoring Perkembangan Status Gizi Anak Dan Balita Secara Digital Dengan Metode Antropometri Berbasis Android. *Jurnal INSTEK (Informatika Sains Dan Teknologi)*, *2*(1), 81–90. https://doi.org/https://doi.org/10.24252/instek.v2i1.2613.g2465

Hors-Fraile, S., Rivera-Romero, O., Schneider, F., Fernandez-Luque, L., Luna-Perejon, F., Civit-Balcells, A., & de Vries, H. (2018). Analyzing recommender systems for health promotion using a multidisciplinary taxonomy: A scoping review. *International Journal of Medical Informatics*, *114*, 143–155. https://doi.org/10.1016/j.ijmedinf.2017.12.018

Huriah, T., & Nurjannah, N. (2020). Risk factors of stunting in developing countries: A scoping review. *Open Access Macedonian Journal of Medical Sciences*, *8*(F), 155–160. https://doi.org/10.3889/oamjms.2020.4466

Kemenkes RI. (2018). Laporan Riset Kesehatan Dasar (RISKESDAS) tahun 2018. In *Kementerian Kesehatan RI*.

Kemenkes RI. (2020). Peraturan Menteri Kesehatan RI, No 2 Tahun 2020 tentang Standar Antropometri Anak. In *Kementerian Kesehatan Republik Indonesia*. 2.

Kemenkes RI. (2022). Survei Status Gizi SSGI 2022. *BKPK Kemenkes RI*, 1–156.

Kramer, M. (2018). Best practices in systems development lifecycle: An analyses based on the waterfall model. *Review of Business & Finance Studies*, *9*(1), 77–84.

Lesmideyarti, D., Rochimah, S., & Yuhana, U. L. (2017). Penyusunan Dan Pengujian Metrik Operabilitas Untuk Sistem Informasi Akademik Berdasarkan ISO 25010. *Inspiration: Jurnal Teknologi Informasi Dan Komunikasi*, *7*(2), 92–100.

Lwin, M. O., Lu, J., Sheldenkar, A., Panchapakesan, C., Tan, Y.-R., Yap, P., Chen, M. I., Chow, V. T. K., Thoon, K. C., Yung, C. F., Ang, L. W., & Ang, B. S. P. (2020). Effectiveness of a mobile-based influenza-like illness surveillance system (FluMob) among health care

workers: Longitudinal study. *JMIR Mhealth Uhealth*, *8*(12), e19712. https://doi.org/10.2196/19712

Pratama, I. S., Nawassyarif, & Aliyah, J. (2019). Pengembangan Sistem Informasi Sarana dan Prasarana di Universitas Teknologi Sumbawa (UTS) Berbasis Web. *Jurnal Informatika, Teknologi Dan Sains*, *1*(1), 39–49.

Purbo, O. W., & Hartanto, A. A. (2002). Teknologi e-learning berbasis PHP dan MySQL. *Elex Media Komputindo*.

Raymond, L., Paré, G., Ortiz de Guinea, A., Poba-Nzaou, P., Trudel, M.-C., Marsan, J., & Micheneau, T. (2015). Improving performance in medical practices through the extended use of electronic medical record systems: a survey of Canadian family physicians. *BMC Medical Informatics and Decision Making*, *15*(1), 27. https://doi.org/10.1186/s12911-015-0152-8

Salameh, B., Eddy, L. L., Batran, A., Hijaz, A., & Jaser, S. (2019). Nurses' attitudes toward the use of an electronic health information system in a developing country. In *SAGE open nursing* (Vol. 5, p. 2377960819843711). https://doi.org/10.1177/23779608198437 11

Sari, D. Y., Dewanto, W. K., & Surateno, S. (2018). Aplikasi Pemantauan Status Gizi Berdasarkan Pengukuran Antropometri Menggunakan Metode Fuzzy Logic. *Jurnal Teknologi Informasi Dan Terapan (J-TIT)*, *5*(1), 55–64. https://doi.org/https://doi.org/10.25047/j tit.v5i1.80

Setyowati, M., & Ardi, M. F. (2017). Pengelolaan Data Pelayanan Kesehatan Ibu dan Anak Bagian Gizi Balita di Puskesmas Berbasis Android Mobile untuk Mendukung Pencapaian Sustainable Development Goals (SDG's). *Semnas & Call for Papers*, 22–26.

Sharma, S. K., Mudgal, S. K., Thakur, K., & Gaur, R.

(2020). How to calculate sample size for observational and experimental nursing research studies? *National Journal of Physiology, Pharmacy and Pharmacology*, *10*(1), 1–8. https://doi.org/10.5455/njppp2020.10.093 0717102019

Sittig, D. F., & Singh, H. (2015). A new socio-technical model for studying health information technology in complex adaptive healthcare systems. In *Cognitive Informatics for Biomedicine: Human Computer Interaction in Healthcare* (pp. 59–80). Springer. https://doi.org/10.1007/978-3-319-17272-9_4

Srivastava, R., Kushwaha, S., Khanna, P., Gupta, M., Bharti, B., & Jain, R. (2022). Comprehensive overview of smartphone applications delivering child nutrition information. *Nutrition*, *103–104*, 111773. https://doi.org/10.1016/j.nut.2022.111773

Utomo, B., Hamzah, T., Soetjiatie, L., & Mudjiono, U. (2021). Android-Based application system for monitoring baby's growth and development. *IOP Conference Series: Materials Science and Engineering*, *1088*(1), 12007. https://doi.org/10.1088/1757-899X/1088/1/012007

Wang, W., Haggerty, J., Loban, E. (., & Liu, X. (2019). Evaluating primary health care performance from user perspective in China: Review of survey instruments and implementation issues. In *International Journal of Environmental Research and Public Health* (Vol. 16, Issue 6, p. 926). https://doi.org/10.3390/ijerph16060926

WHO. (2011). WHO Anthro for personal computers manual. In *World Health Organization*. World Health Organization. https://doi.org/10.25182/jgp.2013.8.1.55-62

WHO. (2020). *Global Nutrition Targets 2025*. https://doi.org/10.1057/9781137477699_6