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Optimization of maternal and child health services based on digital systems for stunting prevention

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ABSTRACT

Stunting remains a major public health challenge in Indonesia due to its long-term consequences on physical growth, cognitive development, and future productivity. Optimizing maternal and child health services is therefore essential to strengthen stunting prevention efforts. This study aimed to explore the implementation of digital-based maternal and child healthcare services and identify strategies for optimizing their role in stunting prevention. A qualitative descriptive design was employed in Kendari City, Indonesia. Fifteen participants, including midwives, nutrition officers, Posyandu cadres, and maternal and child health program coordinators, were selected through purposive sampling based on their direct involvement in maternal and child health services and experience with digital health applications. Data collection was conducted through semi-structured interviews and document reviews and continued until sufficient thematic depth was achieved across participant groups. Data were analyzed using thematic analysis involving coding, categorization, and theme development. To enhance trustworthiness, source triangulation and member checking were applied throughout the study. The findings revealed six major themes. Digital health systems were perceived to improve service quality through faster reporting, more accurate health records, real-time monitoring, enhanced maternal health literacy, and strengthened early detection of stunting risks. Digital platforms also expanded access to healthcare information and services. However, implementation barriers included unstable internet connectivity, limited digital infrastructure, variations in digital literacy, and fragmented information systems. The study suggests that integrated digital health systems may strengthen maternal and child healthcare services and support stunting prevention efforts, although implementation success depends on infrastructure readiness, workforce capacity, and system integration.

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Introduction

Stunting remains a major global public health problem as it has long-term impacts on human resource quality, including impaired physical growth, cognitive development, and an increased risk of chronic diseases in adulthood (Amran et al., 2025; Mulyani et al., 2025; Soliman et al., 2021). This condition generally occurs due to chronic malnutrition, especially during the first 1,000 days of life, which is a critical period for child growth and development (Sudargo & Aristasari, 2018; Vir & Suri, 2023). Furthermore, stunting contributes to increased child mortality and reduced economic productivity in the future (Rufaindah & Patemah, 2021). Therefore, stunting prevention has become a priority in health development, particularly in developing countries (Garina et al., 2024).

The causes of stunting are multifactorial, including maternal nutrition, parenting practices, socioeconomic conditions, and access to quality healthcare services (Jastin & Jaafar, 2024). Maternal nutritional status during pregnancy has been shown to significantly influence the incidence of stunting, where undernourished mothers have a higher risk of having stunted children (Alfarisi et al., 2019; Fitriani & Nurdiana, 2020; Putri et al., 2024). In addition, low maternal education and nutritional literacy contribute to suboptimal child feeding practices (Umar, 2021). Thus, improving maternal and child healthcare services is essential for comprehensive stunting prevention.

Effective maternal and child healthcare services not only focus on medical interventions but also include education, growth monitoring, and continuous nutritional counseling (Perry et al., 2023). Community-based interventions involving healthcare workers and families have been shown to significantly reduce stunting prevalence (Olney et al., 2018). However, conventional service delivery often faces challenges such as limited access, low community compliance, and inadequate continuous monitoring (Delisle, 2021). This indicates the need for more adaptive and efficient healthcare service innovations.

The rapid development of digital technology offers significant opportunities to improve maternal and child healthcare services through digital-based systems or mobile health (mHealth) approaches (Patel et al., 2019). Digital interventions, such as mobile applications and online platforms, have been proven to enhance maternal nutritional literacy, child growth monitoring, and appropriate feeding practices (Hasan et al., 2024). Moreover, digital technology facilitates more effective communication between healthcare providers and communities and expands access to healthcare services (Rianti et al., 2025). Therefore, integrating digital systems into healthcare services represents a promising strategy to enhance stunting prevention efforts.

The urgency of this research is based on the persistently high prevalence of stunting and the suboptimal utilization of digital technology in maternal and child healthcare services (Syamsir et al., 2023). Although various interventions have been implemented, the outcomes remain uneven, with disparities in access and quality of healthcare services still evident. Therefore, innovative approaches that integrate digital technology with healthcare services are needed to improve the effectiveness and sustainability of stunting prevention efforts.

Previous studies have demonstrated that digital-based interventions, such as mobile applications, educational videos, and health monitoring systems, positively influence maternal knowledge and behavior in preventing stunting (Verma & Gupta, 2026). In addition, nutrition counseling programs combined with digital technology have been shown to reduce stunting prevalence and improve child feeding practices (Mistry et al., 2019). Other studies also indicate that Android-based applications significantly improve maternal knowledge in stunting prevention (Rufaindah & Patemah, 2021). However, further research is still needed to optimize the integration of digital systems into comprehensive healthcare services.

Based on the above background, this study aims to analyze and optimize digital-based maternal and child healthcare services for stunting prevention, in order to improve service quality, expand access, and promote sustainable positive health behaviors within the community.

Method

Design

This study employed a qualitative descriptive research design to explore the implementation of digital-based maternal and child health (MCH) services for stunting prevention. The study aimed to describe the utilization of digital health systems, identify implementation challenges, and formulate optimization strategies to improve maternal and child healthcare services.

Research Setting and Participants

The research was conducted at several community health centers (Puskesmas) and integrated health service posts (Posyandu) in Kendari City, Southeast Sulawesi, Indonesia. Kendari was selected because it has actively implemented digital health initiatives to support maternal and child health programs and stunting prevention efforts.

The participants consisted of 15 informants selected through purposive sampling based on their involvement in maternal and child healthcare services. The participants included: 1) 5 midwives responsible for maternal and child health programs; 2) 3 nutrition officers involved in stunting prevention activities; 3) 5 Posyandu cadres who directly assist community-based health services; 4) 2 health program coordinators from

local health centers. Participants were selected based on at least one year of experience in implementing maternal and child health services and familiarity with digital health applications used in healthcare delivery.

Data Collection Technique
Data were collected from January to March 2026 through semi-structured interviews and document reviews. Interviews were conducted face-to-face using an interview guide focusing on the utilization of digital health systems, perceived benefits, implementation barriers, and recommendations for service improvement. Supporting documents such as program reports, health service records, and digital health implementation guidelines were also reviewed to strengthen the findings.

Data Analysis Method
The collected data were analyzed using thematic analysis. The analysis process included data transcription, coding, categorization, theme development, and interpretation. Emerging themes were identified regarding service quality improvement, healthcare accessibility, maternal health literacy enhancement, and challenges in digital health implementation for stunting prevention.

Trustworthiness
To ensure the credibility of the findings, source triangulation was conducted by comparing information obtained from different participant groups and supporting documents. Member checking was also performed by confirming interview summaries with selected participants. These procedures were applied to improve the validity and trustworthiness of the research findings.

Results and Discussions

Characteristics of Participants
Before presenting the findings, it is important to describe the characteristics of the participants involved in this study. A total of 15 participants were selected through purposive sampling based on their direct involvement in maternal and child healthcare services and stunting prevention programs in Kendari City. The participants consisted of midwives, nutrition officers, Posyandu cadres, and maternal and child health program coordinators. Their professional experience ranged from 5 to 17 years, providing diverse perspectives regarding the implementation of digital-based healthcare services.

Table 1. Characteristics of Participants

Code	Position	Institution	Experience (Years)
P1	Midwife	Puskesmas Poasia	8
P2	Midwife	Puskesmas Abeli	10
P3	Midwife	Puskesmas Lepo-Lepo	6
P4	Midwife	Puskesmas Kandai	7
P5	Midwife	Puskesmas Wua-Wua	9
P6	Nutrition Officer	Puskesmas Poasia	5
P7	Nutrition Officer	Puskesmas Abeli	8
P8	Nutrition Officer	Puskesmas Lepo-Lepo	6
P9	Posyandu Cadre	Posyandu Melati	12
P10	Posyandu Cadre	Posyandu Anggrek	7
P11	Posyandu Cadre	Posyandu Mawar	9
P12	Posyandu Cadre	Posyandu Kenanga	5
P13	Posyandu Cadre	Posyandu Flamboyan	8
P14	MCH Program Coordinator	Puskesmas Poasia	15
P15	MCH Program Coordinator	Puskesmas Abeli	17

Overview of Data Analysis Results
The interview data were analyzed using thematic analysis. Following transcription and coding procedures, several recurring patterns emerged from participants' responses. Similar codes were grouped into categories and subsequently developed into broader themes that represent participants' experiences regarding the implementation of digital-based maternal and child health services for stunting prevention.

The coding process generated eight initial codes, which were further organized into six categories and eventually synthesized into six major themes. These themes reflect both the benefits and challenges of implementing digital health systems within maternal and child healthcare services.

Table 2. Initial Coding Process

Raw Statement	Initial Code
"Digital applications make reporting faster."	Faster reporting
"We can identify children at risk earlier."	Early detection
"Internet connection is often unstable."	Network limitation
"Mothers receive health reminders through mobile phones."	Digital education
"Data are easier to monitor."	Real-time monitoring
"Some cadres struggle to use applications."	Low digital literacy
"The system helps us monitor child growth monthly."	Growth monitoring
"Different applications are not fully integrated."	System fragmentation

The initial codes were subsequently categorized according to conceptual similarities. The categorization process enabled the identification of broader dimensions related to service quality, stunting prevention, health literacy, and implementation barriers.

Table 3. Category Development

Codes	Category
Faster reporting, Real-time monitoring, Growth monitoring	Service Quality Improvement
Early detection, Better surveillance	Stunting Prevention Support
Digital education, Health reminders	Maternal Health Literacy
Network limitation, Device limitation	Infrastructure Challenges
Low digital literacy	Human Resource Challenges
System fragmentation	System Integration Challenges

The final stage of analysis resulted in six overarching themes that form the basis of the findings presented in this study.

Table 4. Major Themes Identified from Thematic Analysis

Category	Theme
Service Quality Improvement	Improving the Quality of Maternal and Child Healthcare Services
Stunting Prevention Support	Strengthening Stunting Prevention Through Digital Monitoring
Maternal Health Literacy	Enhancing Maternal Knowledge and Health Literacy
Infrastructure Challenges	Barriers to Digital Health Implementation
Human Resource Challenges	Digital Literacy and Workforce Readiness
System Integration Challenges	Need for Integrated Digital Health Systems

Theme 1. Improving the Quality of Maternal and Child Healthcare Services

The majority of participants perceived that digital health systems significantly improved the quality of maternal and child healthcare services. Participants reported that digital applications simplified administrative procedures, accelerated reporting processes, and improved the accuracy of health records. These improvements enabled healthcare workers to spend more time providing direct services rather than completing manual documentation.

Among the fifteen participants, thirteen stated that digital recording systems facilitated faster access to patient information and reduced the risk of data duplication. Midwives particularly emphasized the efficiency gained through electronic recording and reporting systems.One participant explained:

“Previously, reports had to be compiled manually and submitted periodically. Now, most information can be entered directly into the system, making the reporting process much faster and more accurate.” (P2)

Similarly, nutrition officers highlighted the usefulness of digital systems in monitoring child growth and nutritional status.

“The system helps us track children’s nutritional conditions regularly and identify growth problems much earlier than before.” (P7)

Participants also reported that digital systems enhanced communication among healthcare workers, allowing information to be shared more efficiently across service units. This facilitated coordinated interventions and improved continuity of care for mothers and children.

Theme 2. Strengthening Stunting Prevention Through Digital Monitoring
A dominant theme emerging from the interviews was the role of digital systems in supporting early detection and monitoring of stunting risks. Participants consistently reported that digital platforms enabled systematic monitoring of anthropometric indicators such as weight, height, and nutritional status.

Fourteen participants indicated that digital applications improved their ability to identify children who were experiencing growth faltering. By accessing updated growth records, healthcare workers were able to provide timely counseling and intervention before nutritional problems became more severe. One nutrition officer stated:

"When growth indicators begin to decline, we can immediately identify the child and provide follow-up interventions. This process is much faster compared to manual recording." (P6)

Posyandu cadres also reported that historical growth data stored in digital systems facilitated follow-up monitoring of high-risk children.

"We can easily review previous measurements and monitor whether a child's condition is improving or worsening." (P10)

The findings suggest that digital monitoring systems contribute to more proactive stunting prevention efforts through continuous surveillance and timely response mechanisms.

Theme 3. Enhancing Maternal Knowledge and Health Literacy
Participants widely acknowledged the contribution of digital technologies to improving maternal knowledge regarding nutrition, child growth, immunization, and maternal healthcare practices. According to participants, mothers increasingly rely on mobile phones and digital platforms as sources of health information.

Several participants reported that digital applications provide accessible educational materials that can be reviewed repeatedly according to individual needs. Health reminders delivered through mobile applications were also perceived as useful for improving compliance with healthcare recommendations. One Posyandu cadre explained:

"Many mothers now access health information through mobile applications and social media. They often come to Posyandu with better understanding about nutrition and child development." (P11). Another participant noted:

"Reminder features help mothers remember immunization schedules and regular health check-ups." (P5)

Participants generally agreed that improved access to health information positively influenced maternal awareness and health-related decision-making.

Theme 4. Expanding Access to Maternal and Child Healthcare Services
Beyond improving service quality, participants reported that digital systems contributed to broader healthcare access. Several participants explained that digital communication tools enabled healthcare workers to maintain contact with mothers who were unable to attend health facilities regularly.

Participants also highlighted the role of digital platforms in facilitating health information dissemination across wider geographical areas. This was particularly beneficial for mothers living in areas with limited healthcare resources. One coordinator stated:

"Digital platforms allow us to reach mothers more efficiently, even when face-to-face meetings cannot be conducted frequently." (P14)

The findings indicate that digital systems have enhanced the accessibility and continuity of maternal and child healthcare services.

Theme 5. Barriers to Digital Health Implementation
Despite the reported benefits, participants identified several barriers that limit the effectiveness of digital health implementation. Infrastructure-related challenges emerged as the most frequently mentioned concern.

Twelve participants reported experiencing unstable internet connectivity, particularly during outreach activities and community-based services. Limited availability of digital devices was also identified as a recurring issue. One participant explained:

"Internet access remains unreliable in several service areas, making it difficult to upload data in real time." (P4)

Another participant added:

"Sometimes we have to wait until returning to the health center before entering the data because of network limitations." (P9)

These findings demonstrate that technological infrastructure remains a critical factor influencing the success of digital health initiatives.

Table 5. Frequency of Challenges Reported by Participants

Challenge	Number of Participants Mentioning the Issue
Unstable internet connection	12
Limited digital devices	10
Low digital literacy	11
Multiple reporting systems	9
Lack of technical support	7

Theme 6. Digital Literacy and System Integration

The final theme concerns the readiness of healthcare workers and the integration of digital systems. Participants reported considerable differences in digital literacy levels, particularly among older cadres who were less familiar with technology-based applications. A program coordinator explained:

"Some cadres adapt quickly, while others require continuous guidance and additional training to use the applications effectively." (P15)

Participants also emphasized the existence of multiple health applications operating independently from one another. As a result, healthcare workers frequently had to enter identical information into several systems.One participant noted:

"We often input the same data into different platforms, which increases workload and reduces efficiency." (P8).

Overall, participants viewed digital literacy improvement and system integration as essential priorities for optimizing digital-based maternal and child healthcare services in the future.

Discussion

This study explored the implementation of digital-based maternal and child healthcare services for stunting prevention in Kendari City, Indonesia. The findings revealed that digital health systems have substantially improved healthcare service quality, facilitated early stunting detection, enhanced maternal health literacy, and expanded access to healthcare services. At the same time, several challenges were identified, including infrastructure limitations, disparities in digital literacy, and the fragmentation of digital health information systems. These findings indicate that digital transformation has become an important component of maternal and child health services; however, its effectiveness depends not only on technological availability but also on organizational readiness, human resources, and system integration.

One of the most prominent findings of this study is that digital health systems significantly improve the quality of maternal and child healthcare services. Participants consistently reported that digital applications facilitated faster reporting, more accurate data management, and improved monitoring of maternal and child health indicators. The findings suggest that digital technologies help shift healthcare services from paper-based administrative processes toward more responsive and data-driven healthcare management.

Another important finding is the contribution of digital systems to stunting prevention through continuous growth monitoring and early detection. Participants indicated that digital applications enabled healthcare workers to identify growth faltering more quickly, allowing earlier intervention before nutritional problems developed into chronic conditions. This finding highlights the strategic role of digital surveillance systems in strengthening preventive healthcare approaches.

The study further revealed that digital technologies contribute to improving maternal health literacy. Through mobile applications, online health information, and reminder systems, mothers gain easier access to information regarding nutrition, breastfeeding, immunization, and child development. Increased access

to health information appears to support more informed decision-making among mothers, which is essential during the first 1,000 days of life.

Despite these benefits, the study identified several barriers that continue to affect implementation. Unstable internet connectivity, limited technological infrastructure, differences in digital competency among healthcare workers, and the existence of multiple disconnected information systems were frequently reported by participants. These challenges indicate that digital transformation in healthcare is not solely a technological issue but also an organizational and socio-technical process.

The findings are consistent with previous studies demonstrating the positive impact of digital health technologies on maternal and child healthcare services. Agarwal et al., (2016) reported that mobile health interventions improve healthcare delivery by facilitating communication, monitoring, and information management. Similarly, Lee et al., (2015) found that digital health technologies significantly improve maternal and child healthcare outcomes through enhanced access to healthcare information and services.

The finding that digital systems support stunting prevention aligns with the work of Hasan et al. (2024), who reported that mobile health applications improve maternal nutritional literacy and support child growth monitoring. Likewise, Rianti et al., (2025) found that digital applications can contribute to stunting prevention by improving monitoring systems and strengthening communication between healthcare providers and families.

The present study also supports findings from Beal et al., (2018) and Putri et al., (2024), who emphasized the importance of maternal knowledge in reducing stunting risk. Participants in this study observed that mothers increasingly use digital platforms to access health information, suggesting that digital technologies may serve as effective tools for improving health literacy and promoting healthier childcare practices.

However, the barriers identified in this study are also consistent with previous research. Puspitasari & Ishii, (2016) highlighted persistent digital divides in Indonesia, particularly regarding internet access and smartphone utilization. Similarly, Rahman et al., (2023) reported that technological infrastructure remains a significant challenge in implementing digital health services, particularly in underserved regions.

Several factors may explain the findings observed in this study. First, digital technologies increase the efficiency of information processing by reducing reliance on manual documentation and enabling real-time access to health data. This allows healthcare workers to allocate more time to direct patient care rather than administrative tasks.

Second, digital systems improve the continuity of healthcare services by enabling routine monitoring and timely communication between healthcare providers and service users. Through automated reminders, electronic records, and digital reporting systems, healthcare interventions can be delivered more consistently throughout pregnancy and early childhood.

Third, increased smartphone ownership and internet use among the general population have expanded opportunities for mothers to access health information independently. This contributes to improved health literacy and greater engagement in child health monitoring activities.

Conversely, implementation barriers emerge because technological adoption often develops more rapidly than supporting infrastructure and human resource capacity. Limited connectivity, unequal access to devices, and varying levels of digital literacy create disparities in the utilization of digital health technologies.

This study contributes to the growing body of knowledge on digital health and maternal-child healthcare by demonstrating that digital transformation influences healthcare delivery through multiple pathways, including service efficiency, health monitoring, health literacy enhancement, and accessibility improvement.

The findings support socio-technical perspectives that emphasize the interaction between technology, human resources, and organizational systems in determining implementation success. The study suggests that technological innovation alone is insufficient to achieve optimal healthcare outcomes unless accompanied by adequate infrastructure, workforce readiness, and institutional integration. Furthermore, the findings reinforce health behavior theories suggesting that increased access to health information can positively influence individual knowledge, attitudes, and health-related behaviors.

From a practical perspective, several recommendations can be derived from the findings. First, healthcare institutions should strengthen digital infrastructure, particularly internet connectivity and device availability, to ensure uninterrupted service delivery. Second, regular digital literacy training should be provided to healthcare workers and Posyandu cadres to improve their ability to utilize digital applications effectively.

Third, policymakers should prioritize the integration of multiple health information systems into a unified platform to reduce duplication of work and improve data interoperability. Fourth, digital health applications should be designed using user-centered approaches to ensure accessibility for both healthcare providers and community members with varying levels of digital competency. Finally, maternal health education programs should increasingly utilize digital platforms as complementary tools for promoting nutrition awareness and stunting prevention.

The novelty of this study lies in its qualitative exploration of digital-based maternal and child healthcare services for stunting prevention from the perspectives of multiple stakeholders, including midwives, nutrition officers, Posyandu cadres, and program coordinators.

While previous studies have primarily focused on evaluating specific digital applications or measuring quantitative outcomes, this study provides a comprehensive understanding of how digital systems are utilized in routine healthcare services, the benefits perceived by healthcare providers, and the practical challenges encountered during implementation.

Additionally, the study integrates perspectives on service quality, stunting prevention, health literacy, accessibility, and system readiness within a single analytical framework, offering a more holistic understanding of digital health implementation in maternal and child healthcare settings.

Several limitations should be acknowledged. First, the study was conducted only in Kendari City, which may limit the transferability of findings to other regions with different healthcare infrastructures and socio-demographic characteristics. Second, the study focused primarily on healthcare providers and did not include direct perspectives from mothers as service users. Consequently, the findings may not fully capture user experiences and perceptions regarding digital health services. Third, the qualitative nature of the study does not allow causal conclusions regarding the effectiveness of digital interventions in reducing stunting prevalence. Future studies should expand the scope of investigation by including mothers, caregivers, and community members as research participants to obtain a more comprehensive understanding of digital health utilization.

Quantitative and mixed-method studies are also needed to measure the direct impact of digital health interventions on maternal health outcomes, child nutritional status, and stunting prevalence. Comparative studies across different regions of Indonesia may further identify contextual factors influencing the effectiveness of digital health implementation. Finally, future research should explore integrated digital health ecosystem models that combine maternal and child healthcare services, nutrition monitoring, health education, and community engagement within a unified platform to support sustainable stunting prevention efforts.

Conclusions

This qualitative study explored the implementation of digital-based maternal and child healthcare services for stunting prevention from the perspectives of 15 healthcare providers and program stakeholders in Kendari City, Indonesia. The findings suggest that digital health systems are perceived to contribute to improvements in healthcare service delivery through faster reporting processes, more accurate health data management, continuous monitoring of maternal and child health indicators, and enhanced communication between healthcare providers and communities. Participants also reported that digital technologies support early identification of stunting risks, improve maternal access to health information, and facilitate more proactive preventive healthcare practices. However, these findings should be interpreted within the methodological boundaries of the study. The research was conducted in a single urban setting and involved a relatively small purposive sample consisting of midwives, nutrition officers, Posyandu cadres, and program coordinators. Therefore, the findings reflect the experiences and perceptions of participants within this specific context and should not be generalized to all healthcare settings or populations in Indonesia. Furthermore, as a qualitative study, the research was designed to generate in-depth insights rather than measure causal effects or quantify the effectiveness of digital interventions on stunting outcomes. Despite these limitations, the study provides evidence that digital health systems may serve as valuable supporting tools for strengthening maternal and child healthcare services and stunting prevention programs. The findings highlight the importance of addressing infrastructure constraints, improving digital literacy among healthcare workers, and integrating fragmented information systems to optimize digital health implementation. Future quantitative and mixed-method studies involving larger and more diverse populations are needed to evaluate the measurable impact of digital health interventions on maternal health outcomes, child nutritional status, and stunting prevalence.

References

Agarwal, S., Lefevre, A. E., Lee, J., L'engle, K., Mehl, G., Sinha, C., & Labrique, A. (2016). Guidelines For Reporting Of Health Interventions Using Mobile Phones: Mobile Health (Mhealth) Evidence Reporting And Assessment (Mera) Checklist. Bmj, 352.

Alfarisi, R., Nurmalasari, Y., Nabilla, S., Dokter, P. P., Kedokteran, F., & Malahayati, U. (2019). Status Gizi Ibu Hamil Dapat Menyebabkan Kejadian Stunting Pada Balita. Jurnal Kebidanan Malahayati, 5(3), 271–278.

Amran, R., Pratama, R. R., & Wahyuni, S. (2025). Stunting Sebagai Ancaman Kualitas Sumber Daya Manusia: Perspektif Gizi, Lingkungan, Dan Sosial. Scientific Journal, 4(4), 233–240.

Beal, T., Tumilowicz, A., Sutrisna, A., Izwardy, D., & Neufeld, L. M. (2018). A Review Of Child Stunting Determinants In Indonesia. Maternal & Child Nutrition, 14(4), E12617.

Delisle, H. (2021). Maternal Education Is Essential But May Not Be Sufficient To Prevent Child Stunting: A Commentary. Public Health Nutrition, 24(12), 3753–3755.

Fitriani, H., & Nurdiana, P. (2020). Risk Factors Of Maternal Nutrition Status During Pregnancy To Stunting In Toddlers Aged 12-59 Months. Jurnal Keperawatan Padjadjaran, 8(2), 174–182.

Garina, L. A., Dewi, M. K., Trusda, S. A. D., Purbaningsih, W., Muflihah, H., Tursina, A., Respati, T., & Rahimah, S. B. (2024). Maternal, Child, And Household Risk Factors For Children With Stunting. The Open Public Health Journal, 17(1).

Hasan, D. S., Arief, Y. S., & Krisnana, I. (2024). Mobile Application Intervention To Improve Nutritional Literacy Of Mothers With Stunting Children: A Systematic Review. Pediomaternal Nursing Journal, 10(2), 70–75.

Jastin, H. G., & Jaafar, S. (2024). The Impact Of Maternal Nutritional Status On Child Malnutrition: A Systematic Review. Borneo Epidemiology Journal Учредители: Universiti Malaysia Sabah (Ums), 5(1).

Lee, S. H., Nurmatov, U. B., Nwaru, B. I., Mukherjee, M., Grant, L., & Pagliari, C. (2015). Effectiveness Of Mhealth Interventions For Maternal, Newborn And Child Health In Low–And Middle–Income Countries: Systematic Review And Meta–Analysis. Journal Of Global Health, 6(1), 10401.

Mistry, S. K., Hossain, M. B., & Arora, A. (2019). Maternal Nutrition Counselling Is Associated With Reduced Stunting Prevalence And Improved Feeding Practices In Early Childhood: A Post-Program Comparison Study. Nutrition Journal, 18(1), 47.

Mulyani, A. T., Khairinisa, M. A., Khatib, A., & Chaerunisaa, A. Y. (2025). Understanding Stunting: Impact, Causes, And Strategy To Accelerate Stunting Reduction—A Narrative Review. Nutrients, 17(9), 1493.

Olney, D. K., Leroy, J., Bliznashka, L., & Ruel, M. T. (2018). Procomida, A Food-Assisted Maternal And Child Health And Nutrition Program, Reduces Child Stunting In Guatemala: A Cluster-Randomized Controlled Intervention Trial. The Journal Of Nutrition, 148(9), 1493–1505.

Patel, A. B., Kuhite, P. N., Alam, A., Pusdekar, Y., Puranik, A., Khan, S. S., Kelly, P., Muthayya, S., Laba, T., & Almeida, M. D'. (2019). M-Sakhi—Mobile Health Solutions To Help Community Providers Promote Maternal And Infant Nutrition And Health Using A Community-Based Cluster Randomized Controlled Trial In Rural India: A Study Protocol. Maternal & Child Nutrition, 15(4), E12850.

Perry, H. B., Stollak, I., & Valdez, M. (2023). Reducing Inequities In Maternal And Child Health In Rural Guatemala Through The Cbio+ Approach Of Curamericas: 10. Summary, Cost Effectiveness, And Policy Implications. International Journal For Equity In Health, 21(Suppl 2), 202.

Puspitasari, L., & Ishii, K. (2016). Digital Divides And Mobile Internet In Indonesia: Impact Of Smartphones. Telematics And Informatics, 33(2), 472–483.

Putri, P. M., Shafira, A. S., & Mahardhika, G. S. (2024). Stunting Reduction Strategy In Indonesia: Maternal Knowledge Aspects. The Indonesian Journal Of Public Health, 19(2), 329.

Rahman, F. F., Johan, H., Noorbaya, S., Khatimah, K., & Darsono, S. (2023). Indonesian Perspectives About Telemedicine: Strength Of Social Support, Access, And Internet Use Telehealth Usability Amidst Covid-19. Universal Journal Of Public Health, 11(6), 852–860.

Rianti, E., Pujiastuti, S. E., & Triwinarto, A. (2025). Mobile Application Prototype: Ap3s To Prevent Stunted Babies. International Journal Of Online & Biomedical Engineering, 21(3).

Rufaindah, E., & Patemah, P. (2021). Application Of Â€ Œstunting Preventionâ€ Android-Based Applications To Mother Knowledege And Nutritional Status Of Toddlers Ages 0-36 Months. Jurnal Kebidanan, 11(1), 41–46.

Soliman, A., De Sanctis, V., Alaaraj, N., Ahmed, S., Alyafei, F., Hamed, N., & Soliman, N. (2021). Early And Long-Term Consequences Of Nutritional Stunting: From Childhood To Adulthood. Acta Bio

Medica: Atenei Parmensis, 92(1), E2021168.
Sudargo, T., & Aristasari, T. (2018). 1000 Hari Pertama Kehidupan. Ugm Press.
Syamsir, S. B., Setiawan, A., Kurwiyah, N., Naralia, T. W., Supriyatno, H., & Mar'ah, N. A. (2023). Preventing Stunting Through Digital Family Empowerment: A Thematic Literature Review. Jurnal Keperawatan Komprehensif (Comprehensive Nursing Journal), 9(4).
Umar, F. (2021). Family Centered Approaches To Stunting Prevention. Journal Of Health Literacy And Qualitative Research, 1(2), 84–98.
Verma, T., & Gupta, A. (2026). Popularizing And Assessment Of Effectiveness Of Educational Video To Improve Maternal Nutrition. In Handbook Of Public Health Nutrition: International, National, And Regional Perspectives (Pp. 1–14). Springer.
Vir, S. C., & Suri, S. (2023). Young Child Undernutrition: Crucial To Prioritize Nutrition Interventions In The First 1000 Days Of Life. Indian Journal Of Pediatrics, 90(Suppl 1), 85–94.