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Effect of digital nutrition education via WhatsApp and mHealth on maternal nutrition literacy and child feeding practices: A systematic review

Efek edukasi gizi digital melalui WhatsApp dan mhealth terhadap literasi gizi ibu dan praktik pemberian makan anak: Suatu tinjauan sistematis

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Abstract

Suboptimal infant and young child feeding practices remain a major contributor to child malnutrition, particularly in low- and middle-income countries (LMICs). Maternal nutritional literacy plays a key role in shaping appropriate feeding behaviors. Digital platforms, such as WhatsApp and mobile health (mHealth) applications, have emerged as potential tools for delivering nutrition education. This systematic review followed the PRISMA 2020 guidelines. PubMed, Scopus, and Google Scholar were searched for studies published between 2020 and 2025. Eligible studies included digital nutrition education interventions targeting mothers of infants and young children and reported outcomes related to maternal nutrition literacy and/or child feeding practices. Due to the heterogeneity of the study designs and outcome measures, the findings were synthesized narratively. Fourteen studies were included in the review. Most were conducted in LMIC settings and involved WhatsApp-based or mobile health interventions. Digital education is generally associated with improved maternal nutrition literacy, dietary diversity, timely initiation of complementary feeding, and feeding frequency. Theory-based and interactive interventions have demonstrated stronger engagement than passive approaches. Digital nutrition education via WhatsApp and mHealth shows promising evidence for supporting maternal nutrition literacy and child feeding practices, although methodological variability warrants cautious interpretation.

Keywords: Child feeding practices, Digital nutrition education, Maternal nutrition literacy, mHealth, WhatsApp, Systematic review.

Abstrak

Praktik pemberian makan bayi dan anak yang belum optimal masih menjadi faktor utama terjadinya malnutrisi, terutama di negara berpendapatan rendah dan menengah. Literasi gizi ibu berperan penting dalam membentuk perilaku pemberian makan yang tepat. Platform digital seperti WhatsApp dan aplikasi kesehatan seluler (mHealth) semakin banyak dimanfaatkan sebagai sarana edukasi gizi. Tinjauan sistematis ini disusun sesuai pedoman PRISMA 2020. Pencarian literatur dilakukan melalui PubMed, Scopus, dan Google Scholar untuk artikel yang diterbitkan pada tahun 2020–2025. Studi yang memenuhi kriteria adalah intervensi edukasi gizi digital yang menargetkan ibu dengan bayi atau anak usia dini serta melaporkan luaran terkait literasi gizi ibu dan/atau praktik pemberian makan anak. Karena adanya variasi desain penelitian dan ukuran luaran, sintesis dilakukan secara naratif. Sebanyak 14 studi disertakan, sebagian besar dilakukan di negara berpendapatan

rendah dan menengah serta menggunakan intervensi berbasis WhatsApp atau mHealth. Edukasi digital umumnya dikaitkan dengan peningkatan literasi gizi ibu, keberagaman pangan, ketepatan waktu pemberian MP-ASI, dan frekuensi makan. Namun, variasi metodologis antarstudi memerlukan interpretasi hasil secara hati-hati.

Kata Kunci: Edukasi gizi digital, Literasi gizi ibu, mHealth, Praktik pemberian makan anak, mHealth, WhatsApp, Tinjauan Sistematis.

Introduction

Globally, an estimated 148 million children under five years of age were stunted in 2022, with suboptimal infant and young child feeding practices recognized as major contributing factors (World Health Organization, 2021). In many low- and middle-income countries (LMICs), inadequate complementary feeding, low dietary diversity, and inappropriate feeding frequency remain prevalent challenges to child health. Within households, mothers are typically the primary decision-makers regarding food selection, preparation, and feeding. Therefore, maternal nutrition literacy defined as the ability to access, understand, evaluate, and apply nutrition information has been increasingly recognized as a determinant of child feeding behaviors and overall nutritional outcomes (Tariqujjaman et al., 2022).

Evidence suggests that limited maternal nutrition literacy is associated with suboptimal feeding behaviors, including low dietary diversity, delayed or early initiation of complementary feeding, and reliance on energy-dense but nutrient-poor foods (Jardí et al., 2021). Comparative studies further indicate that higher maternal education and literacy levels are consistently associated with improved child feeding indicators and better nutritional status (Martin et al., 2021). However, the relationship between knowledge acquisition and sustained behavioral change remains complex, as improvements in knowledge do not always translate into consistent feeding practices.

Conventional nutrition education strategies, such as face-to-face counseling and community-based programs, have been widely implemented to improve maternal knowledge and child feeding practices in the past. While these approaches have demonstrated effectiveness, their scalability is often constrained by limited human resources, financial costs, time demands, and geographic barriers, particularly in rural and underserved areas (World Health Organization, 2019). These structural limitations have prompted increasing interest in innovative and scalable delivery models that can reach broader populations more efficiently.

The rapid expansion of digital technology has created new opportunities for delivering nutrition education on a large scale. Digital platforms, including WhatsApp, mobile health (mHealth) applications, SMS messaging, social media, and online counseling, enable flexible, cost-effective, and potentially interactive communication strategies. Compared with conventional face-to-face programs, digital interventions offer advantages in terms of scalability, repeated message exposure, personalization, and real time engagement. Emerging evidence suggests that digital nutrition education can improve maternal knowledge and selected feeding behaviors, particularly when interventions are theory-driven, culturally adapted, and interactive rather than passive information delivery (Hasan et al., 2024; Peiris et al., 2023).

Increasing maternal nutrition literacy through digital education is expected to positively impact efforts to improve child feeding practices. The practice of child feeding covers daily behavior on how to influence food supply for children as well as the frequency of meals, diversity of food types, complementary feeding, responsive feeding practices, and food hygiene. These practices are more a reflection of routines at the household level than of supplementary feeding programs run by the government and directly affect children's food intake. The results indicate that mothers with a higher level of nutritional literacy tend to implement appropriate feeding behaviors such as introducing complementary foods at the right time, providing diverse diets, and using responsive feeding techniques (Getachew et al., 2024; Hanifa et al., 2025).

Although research on digital nutrition education has grown substantially, existing evidence remains fragmented. Some studies primarily measure improvements in knowledge or literacy without assessing whether these gains translate into sustained behavioral changes (Hasan et al., 2024; Nurati et al., 2024; Pajalic et al., 2023). In contrast, other studies rigidly assess the results of feeding practices without clearly linking them to changes in mothers' nutritional literacy processing underlying learning (Pajalic et al., 2023; Peiris et al., 2023). In addition, analyses that previously generally analyzed digital health interventions or nutrition education programs separately have not synthesized much evidence related to how digital nutrition education can simultaneously influence on maternal nutrition literacy and implementation in feeding children (Hasan et al., 2024; Jardí et al., 2021; Nurati et al., 2024) .

Addressing this gap is particularly relevant for low- and middle-income countries, including Indonesia, where smartphone use is widespread, and scalable community-based nutrition strategies are urgently needed. Therefore, this systematic review aimed to synthesize the current evidence on the effects of digital nutrition education delivered via platforms such as WhatsApp and mHealth applications on maternal nutrition literacy and child feeding practices. Specifically, this review seeks to (1) assess the direction and consistency of reported effects, (2) compare the characteristics of effective digital platforms and intervention designs, and (3) identify research and programmatic gaps to inform future community-based nutrition initiatives.

Methods

This study used a *systematic review* design in accordance with the guidelines of the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA). This approach was chosen to comprehensively identify, assess, and synthesize the available evidence related to the impact of digital nutrition education on maternal nutrition literacy with implementation in feeding children.

A comprehensive literature search was performed in PubMed, Scopus, and Google Scholar for studies published between January 2020 and December 2025. The search strategy combined controlled vocabulary and free-text keywords, including "digital nutrition education," "nutrition education," "mHealth," "WhatsApp," "social media," "maternal nutrition literacy," "infant and young child feeding," and "child feeding practices," connected using Boolean operators. The search terms were appropriately adapted for each database to ensure sensitivity and relevance.

The eligibility criteria were defined using the PICO framework. The study population included mothers of infants and young children (0–5 years). The intervention comprised digital nutrition education delivered through platforms such as WhatsApp, mobile health applications, SMS, and other digital media. The comparison involved standard nutrition education, alternative interventions or no intervention. The outcomes included maternal nutrition literacy and/or child feeding practices, such as dietary diversity, complementary feeding initiation, and frequency of feeding.

Eligibility was determined based on predefined inclusion and exclusion criteria, aligned with the PICO framework. Studies were included if they were peer-reviewed original research articles examining digital nutrition education interventions targeting mothers of infants and young children (0–5 years) and reported outcomes related to maternal nutrition literacy and/or child feeding practices. Only primary empirical studies were included to ensure a direct assessment of the intervention effects. Only full-text articles published in English or Indonesian between 2020 and 2025 were considered. Studies were excluded if they focused solely on knowledge outcomes without assessing feeding behaviors, evaluated non-digital interventions, or were conference abstracts, editorials, commentaries, protocols, or non-peer-reviewed publications.

All identified records were imported into reference management software, and duplicates were removed before screening. Titles and abstracts were independently screened by two reviewers to assess eligibility based on predefined criteria. Full-text articles of potentially relevant studies were subsequently independently reviewed by both reviewers. Any

disagreements during the selection process were resolved through discussions and consensus. The study selection procedure, including identification, screening, eligibility assessment, and inclusion, was documented using a PRISMA 2020 flow diagram. Eleven studies met the inclusion criteria and were included in the final synthesis.

Data extraction was conducted independently by two reviewers using a standardized extraction form to ensure consistency across the studies. The extracted data included author(s), year of publication, country, study design, sample size, intervention characteristics, duration, outcome measures, and key findings related to maternal nutrition literacy and child feeding practices. Extracted information was cross-checked and compiled to facilitate structured synthesis

Due to substantial heterogeneity in study designs, intervention formats, outcome measures, and reporting methods, statistical meta-analysis was not feasible. Therefore, a narrative synthesis approach was used. The studies were grouped according to digital platform type and outcome category, and patterns, consistencies, and methodological differences were examined across the studies.

The methodological quality of the included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Tools appropriate for each study design. Quality assessment was conducted independently by two reviewers, and methodological limitations were considered when interpreting the results. Studies were not excluded based on their quality scores. Ethical approval was not required for this review, as it involved a secondary analysis of publicly available published literature.

Consistency checks were conducted throughout the review process to enhance methodological rigor and transparency. The extracted data and quality appraisal results were cross-verified between reviewers to minimize bias and data entry errors. Any discrepancies identified during data extraction or quality assessment were resolved through re-evaluation of the original articles and consensus discussions. This approach aimed to strengthen the reliability of the synthesis and ensure that the interpretations were grounded in the primary study findings.

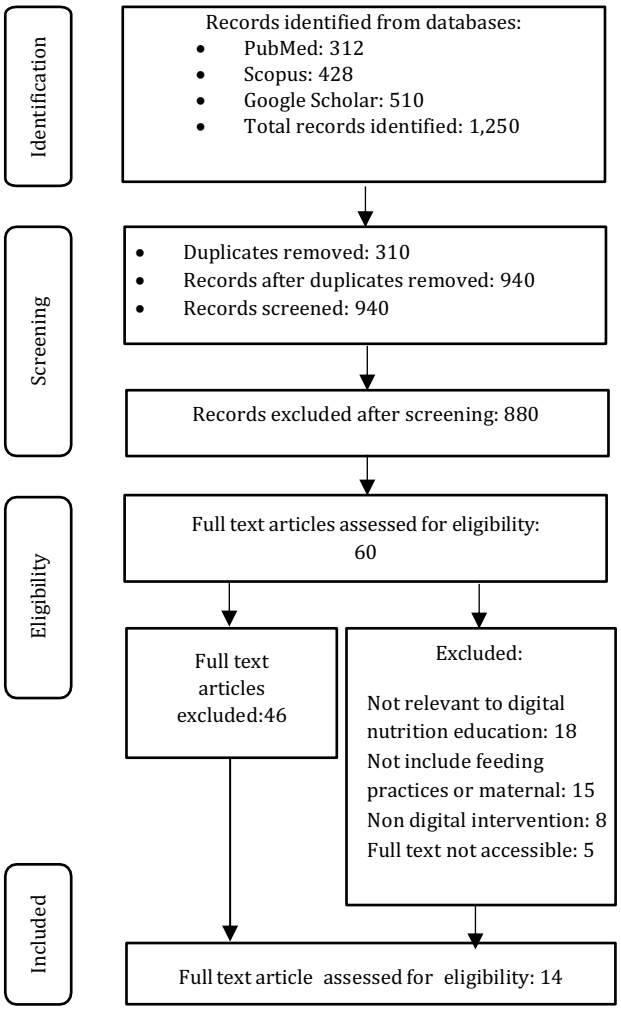

Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow chart

Result and Discussion

Fourteen primary studies published between 2020 and 2025 met the inclusion criteria and were included in the final synthesis. The included studies comprised randomized controlled trials and cluster randomized controlled trials (n = 6), quasi-experimental studies (n = 2), cross-sectional studies (n = 2), qualitative studies (n = 3), and one mixed-methods study (n = 1).

Most studies were conducted in low- and middle-income countries, including Nigeria, Ethiopia, Iran, Sri Lanka, Thailand, India, and Indonesia, as well as the United States. Most of these interventions were implemented within community-based maternal and child health settings. The sample sizes varied substantially, ranging from small qualitative samples (fewer

than 30 participants) to large cluster randomized trials involving several hundred mothers. The intervention duration ranged from short-term programs (4–8 weeks) to structured interventions lasting several months.

Digital platforms included WhatsApp-based group education, smartphone applications (mHealth), SMS-based structured messaging, mobile educational modules, and social media. The primary outcomes assessed were maternal nutritional literacy, infant and young child feeding practices, dietary diversity, complementary feeding initiation, feeding frequency, breastfeeding self-efficacy, exclusive breastfeeding, and caregiver responsiveness.

Table 1. Summary of included studies on digital nutrition education

Author	Country	Design	Digital Platform	Main Findings
Rachmah et al. (2023)	Indonesia	Randomized controlled trial	TPB-based digital education	Significant improvement in maternal intention and complementary feeding practices ($p < 0.05$)
'Arifah et al. (2025)	Indonesia	Quasi-experimental	WhatsApp (SCT-based)	Significant increase in nutrition literacy and feeding behavior scores
Seyyedi et al. (2020)	Iran	Randomized controlled trial	Smartphone-based education	Significant increase in nutrition literacy and feeding behavior scores
Obonyo et al. (2025)	Kenya	Randomized controlled trial	Smartphone modules	Improved feeding practices and maternal awareness; higher adherence in intervention group
Sosanya et al. (2025)	Nigeria	RCT	Mobile-based IYCF education	Significant improvement in IYCF knowledge scores compared to control
Peiris et al. (2023)	Malaysia	Cluster RCT	WhatsApp theory-based intervention	Significant improvement in breastfeeding self-efficacy ($p < 0.05$)
Peiris et al. (2023)	Sri Lanka	Quasi-experimental	Mobile phone structured messages	Significant improvement in dietary diversity among children
Griauzde et al. (2020)	USA	Mix-methods	Sosial media exposure	Digital exposure associated with feeding beliefs and reported practices
Supthanasupe t al. (2022)	Thailand	Qualitative study	Facebook groups	Social media influenced feeding decisions; presence of both supportive and misleading information
Dhawan et al. (2023)	India	Cross-sectional	Mass/digital meedia exposure	Media exposure positively associated with appropriate feeding practices
Mekonnen et al. (2021)	Ethiopia	Cross-sectional	Digital/media access	Greater access to digital information linked to better feeding practices
Peiris et al. (2023)	Sri Lanka	Quasi-experimental	Mobile Phone structure messages	Significant improvement in dietary diversity among children
Gatto et al. (2025)	USA	Intervention + qualitative evaluation	mHealth + virtual support intervention	Improved caregiver confidence; qualitative support for behavior change

Macmillan et al. (2021)	USA	Qualitative	combined with Mobile application	High acceptability and perceived usefulness of mobile feeding education

Impact of Digital Nutrition Education on Maternal Nutrition Literacy

Theory-based interventions grounded in the Theory of Planned Behavior (TPB) and Social Cognitive Theory (SCT) appear to demonstrate stronger literacy-related outcomes. From a theoretical perspective, the TPB may enhance feeding behaviors by targeting intention formation through attitudes, subjective norms, and perceived behavioral control. Similarly, SCT emphasizes self-efficacy, observational learning, and reinforcement mechanisms. Digital platforms that incorporated interactive feedback, modeling, and peer discussion may have strengthened these theoretical pathways, thereby facilitating the translation of knowledge into action rather than merely increasing information exposure (’Arifah et al., 2025; Peiris et al., 2023; Rachmah et al., 2023). This increase is not only a clue to wider access to information but also provides a deeper understanding of nutrition messages and their relationship with making feeding decisions in daily life.

Interventions that combine interactive elements, such as discussion forums, visual media, and repeating key messages, seem more effective than passively delivering information, as they cause mothers to ask questions about their various experiences and gain reinforcement in messages to better support the learning process (Pajalic et al., 2023). This is in line with the principle of learning that has more meaning (Hasan et al., 2024). This result is in line with the principle of adult learning, which emphasizes the importance of participation by reflecting on helping to acquire and retain knowledge (Pajalic et al., 2023).

In addition, digital interventions designed on a theoretical basis have proven to produce stronger and more durable literacy improvements. The program, based on cognitive theory, focuses on strengthening self-efficacy and learning through observation so that mothers can understand the concept of nutrition more deeply and apply it more confidently in daily feeding practices (’Arifah et al., 2025). Additional support from a systematic review of the mHealth app indicates that features such as reminders, interactive feedback, and culturally tailored content play a role in long-term knowledge retention (Pajalic et al., 2023). In general, these findings confirm that digital nutrition education will be most effective if it is designed as an interactive learning process and based on theory and not just one-way information delivery (Hasan et al., 2024; Pajalic et al., 2023)

Effects of Digital Interventions on Child Feeding Practices

In addition to being able to increasing maternal nutrition literacy, digital education interventions are consistently associated with positive changes in the implementation of child feeding. The pathway linking maternal nutritional literacy to feeding behavior appears to be mediated by factors such as self-efficacy, perceived social norms, and contextual constraints. Literacy alone may be insufficient if mothers face structural barriers, conflicting information, or limited household decision-making powers. Thus, digital education may be most effective when it addresses both cognitive understanding and behavioral determinants of health (Obonyo et al., 2025; Rachmah et al., 2023; Seyyedi et al., 2020). These effects were particularly observed in quasi-experimental studies and randomized controlled trials and were assigned to structured interventions over time (’Arifah et al., 2025; Obonyo et al., 2025).

The identified behavioral changes confirm the practical value of digital nutrition education. Through the clarity of guidance delivery and ease of application, as well as reinforcement with reminders and follow-up interactions, digital interventions can help mothers transform their knowledge into routine feeding practices (Gatto et al., 2025; Pajalic et al., 2023; Peiris et al., 2023). These findings indicate that digital platforms can effectively bridge the gap that often occurs between knowledge acquisition and behavioral change, which has often limited the effectiveness of conventional nutrition education programs (Hasan et al., 2024; Jardí et al., 2021).

The most important factor is the strong link between improving maternal nutritional literacy and improving practices in feeding children, which indicates that the role of

maternal knowledge is the main determining factor in children's nutritional outcomes (’Arifah et al., 2025; Tariqujjaman et al., 2022). Mothers with a higher level of literacy are more likely to be able to implement the recommended feeding, indicating that strengthening maternal understanding can be interpreted as an important pathway through which digital interventions can have an impact (Hasan et al., 2024; Rachmah et al., 2023).

Comparative Roles of Digital Platforms in Nutrition Education

This review indicates that different digital platforms may serve distinct yet potentially complementary roles in improving maternal nutrition literacy and child-feeding practices. However, the effectiveness of each platform appears to depend on contextual factors such as intervention design, duration, theoretical grounding, and user engagement rather than the platform itself (Gatto et al., 2025; Peiris et al., 2023; Rachmah et al., 2023). Differences in functional aspects, interactivity levels, and ease of access also affect how nutritional messages are conveyed, understood, and applied by mothers (Jardí et al., 2021). Therefore, understanding these variations is crucial for optimizing the design of digital nutrition education interventions and ensuring the suitability of the platform with the program's goals and the characteristics of the target population (Martin et al., 2021).

WhatsApp-Based Interventions

The platform, based on WhatsApp, specifically has the function of being an interactive means of communication that can allow direct involvement between mothers, fellow participants, and health workers. The studies included in this review consistently indicated a high level of maternal participation in nutrition education programs based on WhatsApp, which is related to improving practices in providing complementary foods and caregiver responses (Rachmah et al., 2023). The conversational nature of WhatsApp is used to support two-way communication so that mothers can ask questions, share experiences, and receive feedback quickly, ultimately supporting the process of active learning (Hasan et al., 2024).

The effectiveness of the intervention through WhatsApp seems to be greatly influenced by the existence of social support mechanisms inherent in it (Pilus et al., 2022). Group discussions can facilitate learning between fellow mothers and help normalize the recommended feeding practices so that the mothers' confidence and motivation to implement appropriate feeding behaviors can be increased (Rachmah et al., 2023). In the context of low- and middle-income countries, where the use of WhatsApp is widespread, this platform can reduce technological barriers and maintain engagement sustainably without the high demands of digital skills, making it very suitable for nutrition education interventions.

WhatsApp-based interventions primarily function as interactive communication tools that facilitate peer discussions and real-time feedback. Several included studies reported improvements in feeding practices and caregiver confidence following WhatsApp-based group education for behavior change (Martin et al., 2021; Rachmah et al., 2023).

Mobile Health (mHealth) Applications

Theoretically grounded mHealth interventions may perform better because they integrate behavioral constructs such as goal-setting, self-monitoring, and reinforcement. Reminder systems may support habit formation, while interactive feedback may strengthen the perceived behavioral control. However, empirical evidence of long-term sustainability remains limited (Hasan et al., 2024; Pajalic et al., 2023; Peiris et al., 2023).

The main advantage of the mHealth platform lies in its ability to deliver nutrition messages in a standardized and consistent manner. Through a reminder system and interactive features, the learning process can be strengthened, and habit formation is supported, which is an important aspect of efforts to maintain behavioral change (World Health Organization, 2019). In addition, mHealth interventions designed with a theoretical basis and integrating concepts such as self-efficacy and learning through observation have been proven to improve feeding practices and maternal confidence (Gatto et al., 2025). These findings suggest that mHealth applications are highly effective in strengthening knowledge and long-term adherence to recommended feeding behaviors.

Social Media and Broader Digital Media Exposure

Social media platforms and a wider range of digital media channels indirectly influence mother-feeding practices. Cross-sectional studies and qualitative research provide clues that mothers exposed to nutritional information through smartphones, online platforms, and social media are likely to have increased awareness of recommended feeding practices (Dhawan et al., 2023; Griauzde et al., 2020; Mekonnen et al., 2021). However, unlike interventions designed in a structured manner, the influence of social media exposure is highly dependent on the credibility, clarity, and consistency of the information received.

While social media provides a wide range of supplies and is easily accessible, several studies have revealed concerns about the spread of misinformation and conflicting feeding advice. Qualitative findings can become inconsistent or unfounded based on scientific evidence, making it difficult for mothers to make decisions and decreasing their confidence in determining appropriate feeding practices (Supthanasup, Banwell, et al., 2022). In addition, stakeholders' views emphasize that the perception of the usefulness and credibility of digital nutrition tools greatly affects the level of trust and involvement of mothers (Macmillan Uribe et al., 2021). These findings highlight the importance of professional supervision and evidence-based content when using social media for nutrition education.

Barriers and Facilitators in Implementing Digital Nutrition Education

Although the findings generally provide positive results, a number of obstacles to the implementation of effective digital nutrition education have been identified. Limited digital literacy, inequality of Internet access, and differences in levels of user engagement are often reported as major challenges, specifically in areas with limited resources (Mekonnen et al., 2021; Supthanasup, Banwell, et al., 2022). If not properly handled, these factors can limit the reach and decrease the effectiveness of digital interventions.

However, the success of digital nutrition education is supported by several factors, including interactive program integration, message delivery in harmony with the cultural context, and ongoing support from health workers and peer networks. Interventions equipped with feedback mechanisms and spaces for social interaction are generally more effective in maintaining maternal involvement and encouraging sustainable behavior change (Gatto et al., 2025). Therefore, the introduction and handling of obstacles and supporting factors is a very important step in maximizing the impact of digital nutrition education programs.

Implications for Community-Based Nutrition Programs

The evidence analyzed indicates that digital nutrition education has a role in being an effective complement to nutrition programs based on existing communities. The studies in this review show that digital platforms, specifically WhatsApp and mobile health applications, can improve nutritional literacy in mothers and can be used to improve practices in feeding children with a flexible, accessible, and interactive educational approach (Peiris et al., 2023; Rachmah et al., 2023). In areas with a high level of smartphone leadership, including Indonesia, the platform provides practical and easy means to expand the reach of nutrition education outside of health services, which are based on facilities.

Digital interventions also play a role in efforts to maintain the sustainability of nutrition education by providing repeated exposure to key messages and enabling the continuous engagement of mothers at all times. This condition is associated with improved child-feeding practices and increased maternal confidence (Gatto et al., 2025; Pajalic et al., 2023). In addition, findings from qualitative studies and cross-sectional research provide access to reliable digital nutrition information, and when integrated into the mothers' daily routine, it can strengthen the implementation of feeding practices that have been recommended (Dhawan et al., 2023; Griauzde et al., 2020).

Therefore, future community-based nutrition initiatives must prioritize the development of interactive digital content with a theoretical basis by ensuring collaboration with health workers to maintain the accuracy and credibility of the information. Handling contextual challenges, such as digital literacy and access to technology, is important for maximizing the effectiveness of programs (Mekonnen et al., 2021; Supthanasup, Cetthakrikul, et al., 2022). Thus, by utilizing

widely used digital platforms, it is possible to add supporting features to digital nutrition education that has the potential to be sustainable and strengthen maternal nutrition literacy by improving child feeding practices at the community level.

Comparative Implications Across Platforms

When compared directly, the existing literature shows that given the heterogeneity of study designs and outcomes, conclusions regarding platform superiority should be interpreted cautiously. Future research should employ standardized outcome measures and longer follow-up periods to determine the comparative long-term effectiveness (Pilus et al., 2022; Rachmah et al., 2023). Meanwhile, mobile health applications are more suitable for delivering structured and theory-based material and strengthening the learning process through reminders and self-learning modules (Pajalic et al., 2023; Peiris et al., 2023). On the other hand, social media is most effectively used as a support channel for awareness-raising efforts but requires careful content management to avoid the spread of misinformation (Macmillan Uribe et al., 2021; Supthanasup, Banwell, et al., 2022).

These differences affirm the importance of choosing digital platforms that are adjusted to the goals of the program and the characteristics of the target population (World Health Organization, 2019). Using more than one platform in an integrated manner can provide synergistic benefits by combining the interactivity of messaging applications with the structure and consistency offered by mHealth tools. This integrative approach has the potential to increase the overall effectiveness of nutrition education programs and improve maternal and child nutritional outcomes in various environmental contexts (Jardí et al., 2021).

Conclusion

Structured digital nutrition education based primarily on theory, delivered through WhatsApp and other mHealth platforms, can improve maternal nutrition literacy and child feeding practices. The effectiveness of the program increased when it integrated behavioral theory, interactive features, and professional moderation. However, the overall strength of the evidence is limited by the heterogeneity of the study designs, outcome measures, intervention duration, and reliance on self-reported data. Digital interventions should be positioned as complementary components of community-based nutrition services rather than as standalone strategies.

From a practical perspective, digital nutrition education represents a feasible and scalable approach in settings with high smartphone and messaging application use. Programs should prioritize culturally tailored, interactive content and involve qualified health professionals to ensure accuracy and address barriers related to digital literacy and technological access issues. Integrating evidence-based digital strategies into existing maternal and child health services may strengthen maternal nutrition literacy and promote sustainable improvements in childcare practices.

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