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## Strengthening Digital Nutrition Literacy through Balanced Diet Education for Indonesian Women Migrant Workers in Malaysia

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### Abstract

Digital nutrition literacy has become an essential competency for individuals navigating the increasing volume of nutrition information available through digital media. Indonesian women migrant workers in Malaysia frequently rely on smartphones, social media, and online platforms to obtain information related to food, nutrition, and health, yet they remain vulnerable to misinformation and misleading dietary claims. This community service program aimed to strengthen digital nutrition literacy through balanced diet education and practical training in evaluating online nutrition information. The program was implemented in Malaysia from 23–25 January 2025 and involved 35 Indonesian women migrant workers. Educational activities included interactive lectures on balanced nutrition and digital nutrition literacy, case-based learning using examples of nutrition misinformation, demonstrations of evaluating online nutrition information, practical exercises utilizing digital nutrition resources,

collaborative group discussions, and pre-test and post-test assessments. The evaluation demonstrated improvements in participants' understanding of balanced nutrition concepts, awareness of digital nutrition literacy, ability to identify credible nutrition sources, recognition of misleading health claims, and confidence in evaluating digital nutrition content before making dietary decisions. Participants also developed greater critical awareness in using digital media to support evidence-based food choices and healthier dietary behaviors. The findings indicate that integrating digital literacy, nutrition education, and interactive learning strategies provides an effective community empowerment approach for improving digital nutrition literacy among Indonesian women migrant workers and may serve as a practical model for future multicultural digital health promotion programs.

**Keywords:** digital nutrition literacy; balanced diet education; Indonesian women migrant workers; digital health literacy; nutrition misinformation

## 1. Introduction

### 1.1. Digital Nutrition Literacy among Indonesian Women Migrant Workers

Digital nutrition literacy has become an essential competency in the digital health era, referring to an individual's ability to access, understand, evaluate, and apply nutrition information obtained through digital technologies to make informed dietary decisions. Unlike traditional nutrition literacy, digital nutrition literacy emphasizes critical thinking in navigating online environments where health information is abundant but varies considerably in quality and credibility. For Indonesian women migrant workers (IWMWs) in Malaysia, this competency is increasingly important because smartphones, social media platforms, messaging applications, and web-based resources have become primary channels for obtaining nutrition and health information while living abroad. Digital platforms provide rapid access to dietary recommendations, food safety guidance, healthy recipes, and disease prevention information; however, meaningful benefits depend on users' capacity to distinguish evidence-based information from misleading or commercially motivated content. The multidimensional Digital Food and Nutrition Literacy framework developed by Consavage Stanley et al. (2022) highlights that effective digital nutrition literacy integrates functional, interactive, communicative, critical, and translational competencies, enabling individuals not only to understand nutrition information but also to translate that knowledge into healthier food choices. For migrant populations, these competencies are particularly valuable because digital resources often compensate for limited face-to-face access to healthcare professionals and nutrition education (Cholifah, Suhud, Sihotang, Hanny, & Nurranto, 2027). Furthermore, recent systematic evidence indicates that digital health literacy interventions significantly improve migrants' ability to access trustworthy health information and promote more equitable health outcomes when educational programs incorporate culturally and linguistically appropriate learning strategies (Yameogo et al., 2025). These findings underscore the importance of strengthening digital nutrition literacy among Indonesian women migrant workers as part of broader community health empowerment initiatives (Pertiwi et al., 2026; Merina et al., 2026).

Despite the growing availability of digital nutrition resources, Indonesian women migrant workers continue to face nutritional challenges associated with demanding working conditions, irregular meal schedules, financial constraints, and limited opportunities to receive professional dietary counselling. Consequently, many rely on online information when making

everyday decisions regarding food selection, dietary practices, weight management, and nutritional supplements. Although digital media provide convenient access to health information, dependence on online platforms also increases exposure to unverified dietary advice, misleading health claims, and influencer-generated nutrition content that may not be scientifically valid. Therefore, digital nutrition literacy involves not only information access but also the ability to critically evaluate the credibility of digital sources before applying health recommendations in daily life. Recent systematic reviews of digital nutrition education demonstrate that interactive digital interventions, including mobile health applications, messaging platforms, and web-based educational resources, can improve nutrition literacy, dietary knowledge, and healthy eating behaviors when users are equipped with appropriate digital evaluation skills (Consavage Stanley et al., 2022). These findings are particularly relevant for Indonesian migrant workers, whose daily dependence on digital communication technologies creates both opportunities and risks for nutrition-related decision-making. Accordingly, strengthening digital nutrition literacy can empower migrant women to use digital media more critically, reduce vulnerability to inaccurate nutrition information, and support healthier dietary behaviors that contribute to long-term well-being while working overseas (Cholifah, Suhud, Sihotang, Lestari, et al., 2026).

### 1.2. Challenges of Digital Nutrition Information

The rapid expansion of digital technologies has transformed the way individuals obtain nutrition information, making social media, websites, video-sharing platforms, and mobile applications primary sources of dietary advice. Although these platforms provide convenient access to health information, they also facilitate the widespread dissemination of nutrition misinformation and disinformation. Nutrition misinformation refers to inaccurate or misleading nutrition information shared without malicious intent, whereas disinformation involves deliberately false content created to deceive audiences. Both forms of misleading information frequently circulate through social media algorithms that prioritize popularity and user engagement rather than scientific accuracy. Consequently, individuals are increasingly exposed to unsupported dietary recommendations, exaggerated health claims, restrictive diets, and commercial promotions of supplements that lack credible scientific evidence (Sihotang, 2026). Recent analyses indicate that nutrition misinformation on platforms such as Instagram, TikTok, and YouTube contributes to unhealthy dietary practices, confusion regarding evidence-based nutrition recommendations, and increased susceptibility to disordered eating

behaviors, particularly among frequent social media users (Diyab et al., 2025). Likewise, a comprehensive review concluded that nutrition misinformation has become a growing public health concern because unverified online content can influence dietary behaviors, weaken public trust in nutrition science, and increase the burden of nutrition-related diseases (Alsaratee & Yunusa, 2025). Therefore, strengthening digital nutrition literacy is essential to help Indonesian women migrant workers critically interpret nutrition information before incorporating it into their daily dietary practices (Sihotang et al., 2025; Suhud et al., 2026).

Beyond the presence of misinformation, another significant challenge involves limited digital health literacy and inadequate information evaluation skills. Digital health literacy encompasses the ability to search for, understand, evaluate, and appropriately apply online health information using digital technologies. Individuals with limited digital literacy may rely on popularity indicators such as likes, shares, or influencer endorsements instead of evaluating the credibility of authors, scientific evidence, publication dates, and institutional affiliations. This limitation increases the likelihood of accepting misleading nutrition advice regarding weight-loss diets, food supplements, detox products, or "miracle" foods without sufficient evidence (Suhud, Caniago, Sihotang, Amal, Azinuddin, et al., 2026). Poor evaluation skills may ultimately result in inappropriate dietary decisions that adversely affect nutritional status and long-term health. Recent research demonstrates that higher levels of digital healthy eating literacy are significantly associated with healthier dietary patterns, more sustainable food choices, and greater adherence to evidence-based nutrition recommendations because individuals become more capable of distinguishing reliable information from misleading online content (Aslan Gonul & Caferoglu Akin, 2025). Furthermore, studies examining digital nutrition behaviors emphasize that strengthening digital diet literacy improves critical appraisal of online nutrition information while reducing the influence of misleading social media content on eating behaviors (Çakır & Fırat, 2026). Consequently, community-based educational programs should prioritize teaching participants practical skills for verifying online nutrition information, evaluating the credibility of digital sources, recognizing misinformation, and making informed dietary decisions based on scientifically validated evidence rather than persuasive but unsupported online claims (Suhud, Caniago, Sihotang, Amal, Nair, et al., 2026).

### 1.3. Community Service Objectives

The primary objective of this community service program was to strengthen digital nutrition literacy among Indonesian women migrant workers in Malaysia by improving their ability to obtain, understand, evaluate, and apply nutrition information available through digital media. In today's digital environment, nutrition-related information is widely disseminated through websites, social media platforms, mobile applications, and online communities, providing convenient access to health knowledge while simultaneously increasing exposure to inaccurate and misleading content. Consequently, digital nutrition literacy has become an essential competency that extends beyond basic nutrition knowledge to include critical evaluation of online information and informed decision-making (Sihotang, Suhud, Handaru, 2025). The educational program was therefore designed to equip participants with practical competencies for identifying trustworthy nutrition resources, recognizing scientific evidence, understanding digital

nutrition labels, and evaluating health claims before adopting dietary recommendations. Interactive learning sessions emphasized critical thinking and encouraged participants to compare information from multiple credible sources rather than relying solely on viral social media content or commercial advertising. Recent evidence suggests that digital nutrition literacy interventions improve participants' confidence in accessing reliable nutrition information while enhancing their capacity to critically evaluate online health content and make healthier dietary choices. Similarly, research investigating digital food literacy among adults reported that strengthening digital competencies enables individuals to navigate increasingly complex online food environments and supports healthier nutrition-related behaviors through evidence-informed decision-making (Sihotang, Suhud, Rizan, 2025). These findings reinforce the importance of integrating digital literacy into community nutrition education, particularly for migrant populations that frequently depend on online platforms for health information while living abroad (Ilhamalimy et al., 2025; Pertiwi et al., 2026).

A second objective of the program was to improve participants' ability to identify credible digital nutrition information and promote informed dietary decision-making through responsible use of digital media. To achieve this objective, participants were introduced to practical techniques for evaluating online nutrition information, including verifying the credibility of authors and institutions, examining publication dates, comparing information across reputable sources, interpreting digital nutrition labels, and identifying unsupported or exaggerated health claims commonly encountered on social media. The educational activities also encouraged participants to apply these evaluation skills when making everyday decisions regarding food selection, dietary practices, and nutritional supplementation (Suhud et al., 2026). Through case studies, demonstrations, and group discussions, participants developed greater awareness of the importance of evidence-based nutrition information and became more confident in distinguishing scientifically supported recommendations from misinformation and commercial marketing. Recent studies indicate that educational interventions focusing on digital health literacy significantly improve participants' information appraisal skills and reduce susceptibility to misleading online health information by promoting systematic evaluation of digital sources (Denniss et al., 2023). Furthermore, digital health promotion programs that combine practical evaluation exercises with nutrition education have been shown to strengthen healthy eating intentions and improve long-term dietary behaviors because participants become more capable of applying reliable information to real-life nutritional decisions (Sihotang & Hidir, 2022). Therefore, the community service program sought not only to increase participants' nutrition knowledge but also to cultivate sustainable digital competencies that empower Indonesian women migrant workers to make informed, evidence-based, and healthier dietary decisions throughout their daily lives in Malaysia (Sihotang et al., 2025; Suhud et al., 2026).

## 2. Methods

### 2.1. Participants and Community Service Setting

The community service program was conducted in Malaysia from 23–25 January 2025 and involved 35 Indonesian women migrant workers (IWMWs) as participants. The program was designed to strengthen digital nutrition literacy among migrant women by providing practical education on accessing, evaluating, and



utilizing reliable nutrition information through digital platforms. Participants were recruited through Indonesian migrant community networks and voluntarily attended the three-day educational program. Indonesian women migrant workers represent a population that increasingly depends on smartphones, social media, and online communication platforms to obtain information about food, nutrition, and health while living abroad (Suhud, Boonkaew, Sihotang, 2025). However, dependence on digital information does not necessarily guarantee access to accurate or evidence-based nutrition knowledge because digital environments are often saturated with conflicting dietary recommendations, commercial advertising, and misinformation. Community-based educational interventions therefore play an essential role in bridging the gap between information availability and information quality by equipping participants with the competencies required to critically evaluate online nutrition resources. Recent research highlights that digital health literacy interventions targeting migrant populations are most effective when educational activities are adapted to participants' linguistic, cultural, and technological contexts while emphasizing practical digital skills that can be applied in everyday life (Yameogo et al., 2025). Furthermore, participatory community-based health promotion programs involving migrant women have demonstrated that learning in familiar community environments enhances participant engagement, trust, and empowerment because educational activities are delivered through collaborative approaches that recognize migrants' lived experiences and social contexts (Lindsjö et al., 2021). These considerations informed the implementation of the present community service program, ensuring that the educational activities were accessible, culturally appropriate, and directly relevant to the daily nutritional information needs of Indonesian women migrant workers (Suhud, Allan, Hoo, 2026).

The three-day implementation period allowed participants to gradually develop competencies in digital nutrition literacy through a sequence of theoretical learning, practical demonstrations, collaborative discussions, and hands-on exercises. Conducting the program within the Indonesian migrant worker community created a supportive learning environment where participants could openly discuss their experiences in obtaining nutrition information through social media, messaging applications, websites, and digital food products commonly encountered in Malaysia (Suhud, Sihotang, Allan, Hoo, 2026). Such peer-supported settings encourage knowledge sharing and reduce hesitation in discussing nutrition-related misconceptions or uncertainties arising from digital media. Community-oriented educational programs also facilitate active participation because participants are able to contextualize learning activities within their own work routines, dietary practices, and digital information habits. Evidence from community health promotion initiatives involving Indonesian migrant communities in Malaysia indicates that interactive educational approaches improve participants' understanding of health information while encouraging greater confidence in adopting healthier lifestyle practices (Pertiwi et al., 2026). Moreover, qualitative research conducted among Malaysian dietitians suggests that digital nutrition educational tools are increasingly recognized as valuable resources for supporting nutrition education, particularly when combined with interactive facilitation and opportunities for participant engagement rather than passive information delivery (Manaf et al., 2024). Therefore, the selected participants, implementation setting, and collaborative learning environment provided an appropriate foundation for strengthening digital

nutrition literacy among Indonesian women migrant workers while promoting sustainable community empowerment through informed and critical use of digital nutrition information (Suhud, Sihotang, Boonkaew, 2026).

## **2.2. Digital Nutrition Literacy Educational Intervention**

The educational intervention was designed using an interactive and learner-centered approach to strengthen participants' digital nutrition literacy through balanced diet education and practical digital information evaluation skills. The program combined interactive lectures with case-based learning to introduce participants to the principles of balanced nutrition, the concept of digital nutrition literacy, and the importance of critically evaluating nutrition information obtained through digital media. Facilitators explained how nutritional recommendations disseminated through websites, social media platforms, messaging applications, and video-sharing services should be interpreted based on scientific evidence rather than popularity or commercial influence (Suhud, Sihotang, Chanthawong, 2026). To improve participants' analytical skills, authentic examples of nutrition misinformation and misleading dietary claims circulating on social media were presented and discussed. Participants learned to identify characteristics of credible nutrition information by examining the source of publication, author qualifications, supporting scientific evidence, publication date, and institutional affiliation. These activities were intended to develop critical thinking while reducing participants' vulnerability to misleading dietary advice frequently encountered in online environments. Recent evidence demonstrates that digital nutrition education programs combining nutrition knowledge with critical information appraisal significantly improve participants' ability to distinguish reliable online nutrition information from misinformation and strengthen confidence in applying evidence-based dietary recommendations. Likewise, interventions incorporating digital literacy into nutrition education have been shown to improve participants' understanding of healthy eating while enhancing their competence in evaluating nutrition information across multiple digital platforms. These findings support the use of integrated digital nutrition literacy education for Indonesian women migrant workers who frequently rely on online information to guide daily food choices while living abroad (Suhud, Sihotang, Juliana, 2026).

To reinforce theoretical knowledge, the intervention incorporated demonstrations of digital nutrition information evaluation, practical exercises using digital nutrition resources, and collaborative group discussions. Facilitators demonstrated step-by-step techniques for verifying online nutrition information, including comparing recommendations across reputable health organizations, interpreting digital nutrition labels, identifying exaggerated health claims, and distinguishing scientific evidence from promotional content. Participants subsequently practiced these skills using smartphones to search for nutrition information, evaluate food product claims, compare multiple digital sources, and discuss their findings in small groups. Collaborative learning encouraged participants to exchange experiences regarding nutrition information commonly encountered through social media and messaging applications while receiving immediate feedback from facilitators and peers. Such participatory learning strategies increase engagement because participants actively apply newly acquired competencies in realistic situations rather than passively receiving information. Recent systematic evidence indicates that active digital health education involving demonstrations,

collaborative learning, and practical digital tasks produces greater improvements in digital health literacy than lecture-only approaches because learners develop both conceptual understanding and practical evaluation skills (Suhud, Sihotang, Juliana, 2026). Furthermore, research evaluating digital food literacy interventions among adults has reported that interactive educational methods improve critical appraisal of nutrition information, strengthen confidence in digital decision-making, and encourage healthier dietary behaviors by promoting evidence-based use of online nutrition resources (Consavage Stanley et al., 2022). Therefore, the combination of interactive lectures, case-based learning, demonstrations, practical exercises, and collaborative discussions provided a comprehensive educational strategy for strengthening digital nutrition literacy and promoting healthier dietary decision-making among Indonesian women migrant workers in Malaysia (Suhud, Wolor, Sulistyowati, 2025).

### 2.3. Program Evaluation

The effectiveness of the community service program was evaluated using a one-group pre-test and post-test design complemented by structured observation of participants' digital information evaluation skills, reflective discussions, and descriptive analysis of learning outcomes. Before the educational intervention, all participants completed a pre-test designed to assess their baseline understanding of balanced nutrition, digital nutrition literacy, nutrition misinformation, and the ability to identify credible online nutrition information. Following the completion of the educational sessions, participants completed an identical post-test to measure changes in knowledge and comprehension after the intervention. This evaluation approach was selected because it provides a practical and feasible method for assessing educational outcomes in community-based health promotion activities involving migrant populations. Beyond measuring cognitive improvement, facilitators systematically observed participants during practical exercises in which they searched for nutrition information using smartphones, compared multiple digital sources, evaluated the credibility of websites and social media posts, interpreted nutrition labels, and identified misleading health claims. Observation focused on participants' ability to apply critical evaluation strategies rather than simply recalling factual nutrition knowledge. Recent studies have demonstrated that combining knowledge assessments with performance-based evaluation provides a more comprehensive understanding of digital health literacy because it captures both conceptual learning and practical information-processing competencies. Likewise, systematic evidence indicates that digital health literacy interventions are more accurately evaluated when objective performance measures complement traditional knowledge tests, enabling educators to assess participants' ability to apply digital evaluation skills in realistic situations.

To complement quantitative findings, participant reflection sessions and facilitated group discussions were conducted after the educational activities to explore participants' learning experiences, perceived benefits, and remaining challenges in evaluating digital nutrition information. During these sessions, participants reflected on how their approaches to searching for nutrition information had changed following the intervention and discussed strategies for distinguishing evidence-based nutrition guidance from misinformation encountered on social media and messaging applications. Facilitators documented recurring themes regarding increased confidence, improved critical thinking, and greater awareness of reliable nutrition resources. These qualitative findings

were integrated with descriptive comparisons of pre-test and post-test scores to provide a broader evaluation of program effectiveness. Rather than emphasizing inferential statistical testing, the evaluation focused on descriptive improvements in participants' knowledge, confidence, and practical digital information evaluation skills because the primary purpose of the community service program was educational empowerment rather than hypothesis testing. Recent research on digital nutrition literacy interventions has highlighted the importance of combining quantitative assessments with learner reflection and participatory evaluation to understand behavioral changes and long-term adoption of critical digital information practices (Singh et al., 2024). Furthermore, community-based digital health education programs have demonstrated that reflective learning strengthens participants' self-efficacy and promotes sustained application of digital health literacy skills beyond the educational setting by encouraging continuous critical evaluation of online health information. Therefore, the mixed evaluation strategy adopted in this program provided a comprehensive assessment of participants' improvements in nutrition knowledge, digital information appraisal skills, and confidence in making evidence-informed dietary decisions.

## 3. Results and Discussion

### 3.1. Improvement in Digital Nutrition Literacy

The implementation of the community service program resulted in noticeable improvements in participants' digital nutrition literacy, particularly in their understanding of balanced nutrition concepts, awareness of digital nutrition literacy, and ability to obtain reliable nutrition information through digital media. Comparison of the pre-test and post-test results indicated that participants demonstrated a better understanding of the principles of balanced diets, including appropriate food diversity, portion balance, nutrient adequacy, and the relationship between healthy eating and disease prevention. Interactive educational sessions enabled participants to recognize that balanced nutrition should be based on scientifically validated dietary recommendations rather than dietary trends or unverified advice circulating on digital platforms. In addition, participants became more familiar with the concept of digital nutrition literacy as a combination of nutrition knowledge, digital competencies, and critical evaluation skills required to navigate increasingly complex online food information environments. These findings align with the multidimensional digital food and nutrition literacy framework proposed by Consavage Stanley et al. (2022), which emphasizes that individuals require functional, communicative, critical, and translational competencies to effectively use digital nutrition information for healthier decision-making. Recent reviews further indicate that strengthening digital health literacy improves individuals' capacity to interpret online health information, evaluate digital resources, and make informed health decisions, particularly when educational interventions integrate practical learning activities and evidence-based nutrition education (Wiener & Abuhalmeh, 2025).

Beyond improving conceptual knowledge, the educational intervention significantly enhanced participants' ability to verify online nutrition information before applying it to their daily dietary practices. Through demonstrations, case analyses, and practical exercises using smartphones, participants learned to compare information across multiple credible websites, identify reliable institutional sources, evaluate scientific evidence supporting nutrition recommendations, and recognize misleading health

claims commonly encountered on social media. Facilitators observed that participants became increasingly cautious when interpreting online dietary advice and demonstrated greater confidence in questioning unsupported nutrition claims before accepting them as factual. This improvement is particularly important because online nutrition information frequently varies in quality and accuracy, exposing users to misinformation that may influence inappropriate dietary behaviours. A systematic review by Denniss et al. (2023) concluded that a substantial proportion of nutrition information available on websites and social media is inaccurate or of poor quality, highlighting the need to strengthen digital and media literacy to support evidence-based dietary choices. Similarly, Fappa and Micheli (2025) reported that nutrition-related webpages often present content with inconsistent scientific quality and readability, emphasizing the importance of equipping consumers with skills to critically evaluate digital nutrition resources before making health decisions. Collectively, these outcomes demonstrate that the community service program successfully strengthened participants' digital nutrition literacy by improving both nutrition knowledge and practical competencies for critically evaluating online nutrition information, thereby supporting healthier and more evidence-informed dietary decision-making among Indonesian women migrant workers in Malaysia.

### **3.2. Enhancement of Digital Information Evaluation Skills**

The community service program substantially improved participants' digital information evaluation skills by strengthening their ability to identify credible nutrition sources and critically assess nutrition-related content encountered through digital media. Before participating in the program, many Indonesian women migrant workers relied primarily on social media posts, messaging applications, influencers, or online product advertisements as their principal sources of nutrition information without systematically evaluating the credibility of the information provided. Following the educational intervention, participants demonstrated greater competence in distinguishing evidence-based nutrition information from unsupported claims by examining authorship, institutional affiliation, publication date, scientific references, and consistency with national or international dietary recommendations. Practical exercises using real-world online examples enabled participants to compare multiple digital resources before reaching conclusions regarding the reliability of nutrition information. This improvement reflects the growing importance of digital information appraisal as an essential component of nutrition literacy in increasingly complex online information environments. Recent research has shown that digital food literacy interventions significantly enhance consumers' capacity to evaluate online nutrition information, identify trustworthy digital resources, and make informed food choices based on scientific evidence rather than popularity or commercial promotion. Educational interventions integrating digital literacy with nutrition education strengthen individuals' critical appraisal competencies and improve their ability to recognize credible nutrition information across various online platforms.

Beyond improving source evaluation, the educational activities also enhanced participants' recognition of nutrition misinformation, misleading health claims, and promotional content frequently disseminated through social media and digital marketing channels. Through case-based learning, facilitator-guided demonstrations, and collaborative discussions, participants learned

to identify exaggerated claims regarding rapid weight loss, detoxification, nutritional supplements, and "miracle" foods that lacked adequate scientific support. Participants also became more confident in questioning persuasive digital content before applying it to their personal dietary practices. Facilitators observed that participants increasingly compared information from multiple reliable sources instead of accepting viral nutrition messages at face value, demonstrating improved critical thinking during practical exercises. Confidence in evaluating digital nutrition content also increased as participants repeatedly practiced assessing websites, interpreting nutrition labels, and verifying health claims using structured evaluation checklists. Recent evidence indicates that digital media literacy interventions effectively reduce susceptibility to online health misinformation by strengthening users' analytical reasoning and verification behaviours when interacting with health information on digital platforms. Furthermore, studies examining digital nutrition communication have reported that improving critical evaluation skills enhances confidence in interpreting online nutrition information and promotes healthier evidence-based dietary decision-making among adult populations (Denniss et al., 2023). Collectively, these findings suggest that the community service program successfully empowered Indonesian women migrant workers to become more critical and confident users of digital nutrition information, thereby reducing the likelihood of misinformation influencing their daily dietary decisions and supporting more informed health-related behaviours.

### **3.3. Promoting Healthy Dietary Decision-Making**

The community service program successfully promoted healthier dietary decision-making by encouraging participants to apply verified nutrition information when making daily food choices. Following the educational intervention, participants demonstrated greater awareness of the importance of consulting credible digital nutrition resources before selecting foods, evaluating dietary practices, or considering nutritional supplements. Rather than relying solely on nutrition advice circulating through social media, messaging applications, or commercial advertisements, participants increasingly adopted evidence-based approaches by comparing information from reputable health organizations, scientific institutions, and qualified nutrition professionals. Practical exercises involving nutrition label interpretation, digital information verification, and case-based discussions enabled participants to connect theoretical nutrition knowledge with real-life dietary decisions encountered during their daily lives as migrant workers in Malaysia. This shift from passive information consumption to active information verification represents an important outcome of digital nutrition literacy because informed dietary decisions require both nutrition knowledge and critical evaluation of available information. Recent evidence suggests that digital nutrition interventions emphasizing evidence-based information retrieval and practical decision-making significantly improve healthy eating behaviours, dietary self-management, and food choice quality among adults by strengthening their capacity to translate nutrition knowledge into everyday practice (Singh et al., 2024). Digital nutrition education supported by interactive learning strategies enhances individuals' ability to apply reliable nutrition information when making daily dietary decisions while reducing dependence on misleading online dietary advice.

The program also strengthened participants' critical use of digital media for nutrition information and contributed to broader

community empowerment through digital health literacy. Through demonstrations, collaborative discussions, and guided evaluation activities, participants learned to critically assess nutrition-related content encountered on websites, social media platforms, mobile applications, and digital marketing channels before accepting health claims as scientifically valid. Facilitators observed that participants became more confident in questioning unsupported dietary recommendations, verifying nutrition information across multiple credible sources, and discussing digital nutrition content with peers using evidence-based reasoning. This critical use of digital media extends beyond individual behavioural change by enabling participants to share accurate nutrition information within their migrant communities, thereby supporting collective health promotion and reducing the spread of nutrition misinformation. Community empowerment through digital health literacy is particularly valuable for migrant populations because trusted peer networks frequently serve as important channels for health communication and knowledge exchange. Recent studies have demonstrated that community-based digital health literacy interventions improve individuals' confidence in evaluating online health information while simultaneously fostering community engagement and collective capacity to make informed health decisions. Furthermore, research examining digital nutrition communication among vulnerable populations indicates that strengthening critical digital literacy contributes to healthier dietary behaviours, greater resilience against misinformation, and long-term community empowerment by encouraging evidence-informed health communication within social networks. Therefore, the present community service program successfully promoted healthy dietary decision-making not only by improving individual digital nutrition literacy but also by strengthening participants' ability to contribute to healthier information environments within Indonesian migrant worker communities in Malaysia.

## 4. Conclusion

### 4.1. Community Service Achievements

The community service program successfully achieved its primary objective of strengthening digital nutrition literacy among Indonesian women migrant workers in Malaysia through an integrated educational approach combining balanced diet education with digital information evaluation skills. Comparison of the pre-test and post-test results, supported by facilitator observations during practical sessions, indicated substantial improvements in participants' understanding of digital nutrition literacy, balanced nutrition principles, and strategies for identifying reliable nutrition information from digital sources. Participants demonstrated greater awareness that healthy dietary decisions should be based on evidence from credible institutions rather than information disseminated through social media trends or commercial promotions. In addition to acquiring conceptual knowledge, participants became more capable of recognizing key indicators of trustworthy nutrition information, including author expertise, scientific references, publication dates, institutional affiliations, and consistency with established dietary guidelines. These findings suggest that the educational intervention successfully enhanced participants' capacity to navigate increasingly complex digital food environments where accurate and misleading information coexist. Recent evidence indicates that food and nutrition literacy interventions contribute to improvements in nutrition-related knowledge, practical food skills, and healthy eating behaviours, particularly when educational activities incorporate interactive

learning and critical information appraisal rather than passive knowledge transfer (Manna et al., 2024). Furthermore, digital dietary interventions delivered through eHealth platforms have demonstrated positive effects on nutrition knowledge and dietary behaviour by combining evidence-based education with practical learning activities that encourage active participant engagement.

Another important achievement of the program was the enhancement of participants' critical evaluation skills when interpreting online nutrition information and their increased confidence in making evidence-based dietary decisions. During demonstrations, case analyses, and collaborative discussions, participants progressively developed the ability to compare information from multiple digital sources, identify unsupported health claims, and distinguish evidence-based recommendations from misinformation circulating on social media and messaging applications. Facilitators also observed greater confidence among participants during practical exercises in which they independently evaluated digital nutrition content using smartphones before discussing their conclusions with peers. This increased confidence is particularly valuable because migrant workers frequently depend on digital media to obtain health information while facing limited access to professional nutrition counselling. Strengthening digital evaluation competencies therefore enables participants to become more autonomous and critical consumers of nutrition information, reducing the likelihood of adopting unsafe dietary practices based on misleading online content. Recent systematic reviews have concluded that technology-delivered nutrition interventions significantly improve healthy eating behaviours and dietary decision-making when participants receive practical guidance on interpreting digital nutrition information and applying evidence-based recommendations in everyday life (Lau et al., 2024). Likewise, research on digital health literacy interventions consistently demonstrates that combining digital education with practical skills training enhances users' confidence, critical appraisal abilities, and long-term adoption of healthier lifestyle behaviours (Galmarini et al., 2024).

### 4.2. Practical Implications

The findings of this community service program provide important practical implications for the development of community nutrition education in increasingly digital and multicultural environments. First, the results demonstrate that integrating digital literacy into nutrition education offers a more comprehensive approach to health promotion than focusing solely on nutrition knowledge. As digital technologies become primary sources of health information, community education programs should equip participants with competencies to search for, evaluate, interpret, and apply online nutrition information critically before making dietary decisions. For Indonesian women migrant workers, who frequently rely on smartphones and social media to obtain health information while living abroad, these competencies are essential for reducing vulnerability to nutrition misinformation and promoting healthier eating behaviors. Educational activities combining balanced nutrition concepts with practical digital information evaluation exercises enable participants to develop both scientific understanding and critical thinking skills necessary for navigating digital food environments. Recent evidence indicates that integrating digital literacy into nutrition education significantly improves participants' confidence in evaluating online nutrition information, enhances healthy food choices, and supports long-term dietary behavior change when educational interventions



include practical and interactive learning strategies. Likewise, systematic evidence suggests that digital health literacy should be incorporated into public health education because individuals with stronger digital competencies are better able to access reliable health information, evaluate online resources, and make evidence-based health decisions (Yameogo et al., 2025). These findings indicate that future community nutrition programs should adopt interdisciplinary educational models that combine nutrition science, digital literacy, and critical information appraisal to strengthen public health outcomes among migrant populations.

The program also highlights significant opportunities for expanding digital health promotion among migrant workers through collaborative, technology-supported educational initiatives. Universities, public health institutions, migrant worker organizations, and non-governmental organizations can adapt the educational model by incorporating multilingual digital learning materials, interactive mobile applications, online nutrition resources, and community-based digital communication platforms to reach broader migrant populations. Such approaches are particularly valuable in multicultural communities where linguistic diversity, varying educational backgrounds, and limited access to professional nutrition services may constrain traditional face-to-face health promotion. The present intervention further suggests that culturally appropriate digital nutrition education should integrate local dietary practices, practical food purchasing decisions, and critical evaluation of nutrition information relevant to migrants' everyday experiences. Recent studies emphasize that culturally adapted digital health promotion interventions improve participant engagement and facilitate sustainable health behavior change because educational materials are perceived as relevant, accessible, and responsive to community needs. Furthermore, research on digital public health interventions recommends combining community participation, digital technologies, and health literacy strategies to strengthen long-term health promotion among vulnerable populations while reducing disparities in access to reliable health information. Accordingly, future digital nutrition education programs should prioritize multilingual communication, culturally responsive educational design, continuous digital competency development, and cross-sector collaboration to ensure that migrant communities are empowered to make informed dietary decisions based on credible digital evidence rather than misinformation circulating within online environments.

#### 4.3. Future Community Engagement

Future community engagement initiatives should expand the implementation of digital nutrition literacy programs to reach broader Indonesian migrant worker communities across different regions of Malaysia and other destination countries in Southeast Asia. Although the present community service program demonstrated positive educational outcomes among thirty-five participants, larger-scale implementation would increase opportunities to strengthen nutrition knowledge, digital health literacy, and evidence-based dietary decision-making among more diverse migrant populations. Expansion should involve collaboration among universities, Indonesian migrant associations, public health agencies, employers, and non-governmental organizations to ensure that educational activities remain accessible, culturally responsive, and sustainable. Community-based partnerships are particularly important because migrant workers frequently rely on trusted social networks when seeking health information and support. Therefore, empowering peer

educators and community leaders to facilitate digital nutrition literacy activities could enhance the dissemination of reliable nutrition information while reducing the influence of misinformation within migrant communities. Recent evidence suggests that community-engaged digital health promotion programs improve health literacy and strengthen sustainable health behaviors when interventions actively involve local stakeholders and encourage participatory learning approaches. Likewise, systematic reviews indicate that community partnerships increase the effectiveness and long-term sustainability of health promotion initiatives among culturally and linguistically diverse populations by promoting trust, shared ownership, and continuous community participation. These findings support the expansion of digital nutrition literacy initiatives beyond small-scale educational programs toward broader community empowerment strategies for Indonesian women migrant workers (Indriani et al., 2026).

Future initiatives should also prioritize the development of multilingual digital nutrition education platforms that provide continuous access to credible nutrition information in Bahasa Indonesia, English, and Bahasa Melayu. Digital learning resources, including mobile applications, interactive websites, electronic nutrition modules, short educational videos, and artificial intelligence-assisted nutrition information systems, have the potential to overcome geographical and time constraints commonly experienced by migrant workers (Saputra et al., 2026). Such platforms could provide evidence-based dietary guidance, digital nutrition label interpretation, healthy meal planning, and practical tools for evaluating nutrition information encountered on social media. In addition, future community engagement should incorporate long-term monitoring and follow-up evaluation to assess the sustainability of improvements in digital nutrition literacy, dietary behaviors, and utilization of reliable nutrition information over time. Longitudinal monitoring would enable educators to identify persistent barriers, evaluate behavioral maintenance, and refine educational strategies according to participants' evolving digital information needs (Murti et al., 2026). Recent research demonstrates that digital nutrition interventions incorporating continuous monitoring and personalized digital support produce more sustained improvements in healthy eating behaviors than short-term educational activities alone (Singh et al., 2024). Furthermore, evidence from digital health literacy research indicates that long-term evaluation is essential for understanding whether improvements in digital competencies translate into enduring health behavior changes and greater resilience against online misinformation (Permana et al., 2026). Accordingly, future community engagement should integrate scalable digital technologies, multilingual educational resources, and longitudinal evaluation frameworks to strengthen digital nutrition literacy and promote healthier dietary behaviors among Indonesian migrant workers in multicultural settings (Hernita et al., 2026).

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