


# Leveraging social media for public health nutrition in low- and middle-income countries: Addressing malnutrition, enhancing food security, and promoting health equity

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## Abstract

Malnutrition, in all its forms, remains a pressing global public health challenge disproportionately impacting low- and middle-income countries (LMICs). Despite progress, significant gaps in nutrition equity persist. The widespread adoption of social media, now exceeding five billion users worldwide, offers new, low-cost opportunities for scalable public health nutrition interventions. However, a comprehensive synthesis of its applications, effectiveness, and limitations within LMICs remain limited. This narrative review explores the role of social media in promoting public health nutrition across LMICs. It critically examines how digital platforms have been leveraged to improve nutrition education, promote dietary behaviour change, enhance food security, and advance health equity. The review also highlights key challenges and proposes directions for research and policy reform. Social media interventions show promise for increasing nutrition knowledge, engaging underserved populations, and supporting maternal and adolescent health. However, barriers such as the digital divide, low media literacy, misinformation, and unregulated marketing of ultra-processed foods (UPFs) limit broader impact. Integrating digital inclusion strategies and stronger policy frameworks is essential. Social media holds transformative potential for promoting health equity and addressing malnutrition in LMICs. To realise this, governments and stakeholders must address digital access gaps, regulate commercial influences, and support community-driven, evidence-based content delivery.

## INTRODUCTION

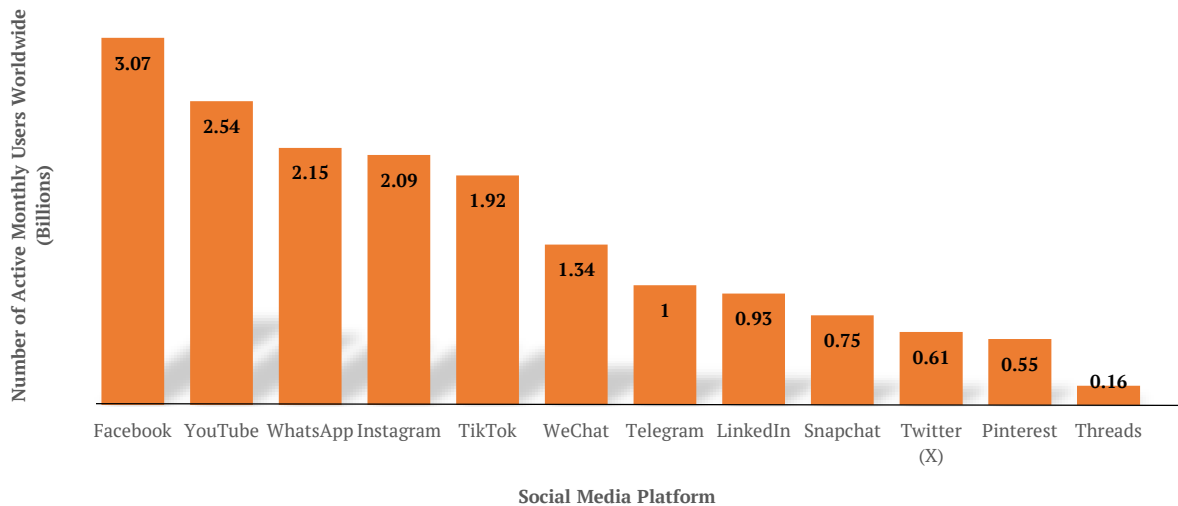
Social media is a pillar of modern-day communication, changing the way people communicate with each other, relate to one another, and disseminate information. Particularly through third-party platforms offering content sharing within virtual societies — for example, Facebook, LinkedIn and Instagram— social media allows global, real-time interactions (Wesley, 2024; Hagg et al. 2018). As illustrated in Figure 1, currently, Facebook leads all platforms with over three billion monthly active users, followed by YouTube and Instagram, each demonstrating substantial global reach. TikTok and WeChat also maintain extensive user bases, while platforms like Pinterest and X (formerly

Twitter) show comparatively lower engagement levels (DataReportal, 2025).

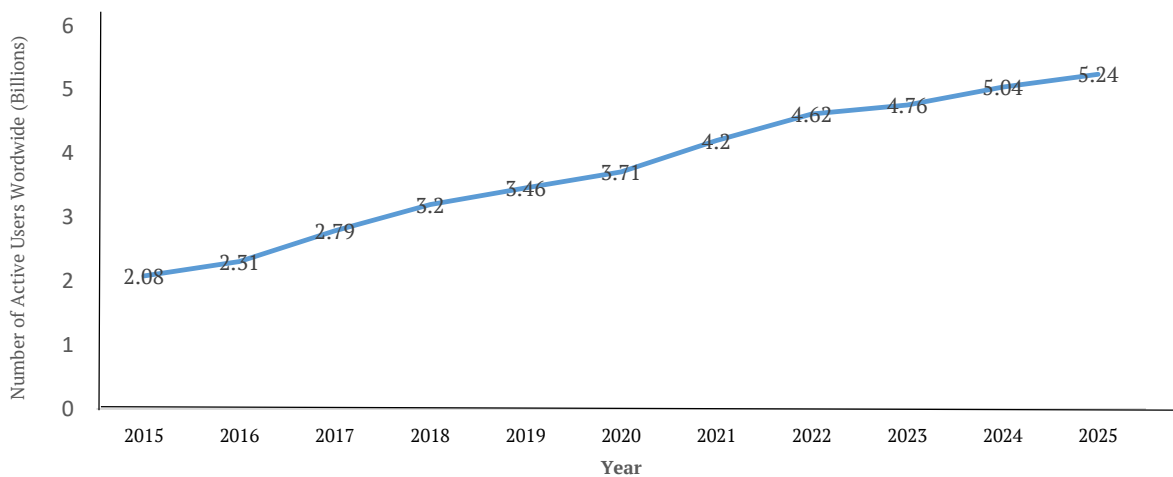
The exponential growth of social media usage is illustrated in Figure 2, which depicts the rise in monthly active users across leading platforms over the past decade. As of April 2025, there were 5.31 billion social media users, 64.7% of the overall global population, a 41% increase from 2020 (DataReportal, 2025). This rapid growth presents not only social and economic opportunities, but also significant potential for addressing pressing public health issues, including one of the most complex and persistent— malnutrition (Jeyaraman et al. 2023).

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**Figure 1. Monthly Active Users of Leading Social Media Platforms Worldwide in 2025.** Adapted from DataReportal, 2025.



**Figure 2. Ten Year Social Media Growth Statistics.** Adapted from Backlinko, 2025.

Despite decades of global health investment, malnutrition remains a major public health challenge. It encompasses undernutrition, micronutrient deficiencies, and overweight and obesity – all of which can occur across the life course and often coexist within populations (Saunders and Smith, 2010; Siddiqui et al. 2020). In 2023, approximately 733 million people worldwide were undernourished, with the vast majority living in low- and middle-income countries (LMICs), particularly in Sub-Saharan Africa and South Asia (FAO, 2024). These high rates reflect not only individual dietary choices, but also structural determinants such as food insecurity, inadequate education, poverty, and insufficient access to healthcare and safe environments (Hyseni et al. 2016; Odoms-Young et al. 2023).

Health promotion aims to empower individuals and communities to take control of these health determinants. It goes beyond treating disease to creating supportive environments for well-being through education, advocacy, and social change (Caron et al. 2023; de Vere Hunt and Linos, 2022). Within this framework, nutrition is recognised as a cornerstone determinant of health, with significant implications for physical development, disease prevention, and quality of life (Brandstetter et al. 2015; Saunders and Smith, 2010).

Over the past decade, social media has become an important tool for health promotion, particularly in high-income countries, where it has been used to improve nutrition-related behaviours. For example, the FoodHero campaign in the United States used interactive, user-generated content to encourage healthier food choices, promote positive beliefs about food, and reduce food waste (Tobey et al. 2016; Tobey and Manore, 2013). However, not all campaigns have led to meaningful behaviour change. The UK's Change4Life campaign, launched in 2009, achieved high levels of awareness but only modest shifts in behaviour and attitudes (Croker et al. 2012). A subsequent effort, the 100-Calorie Snack Campaign, similarly failed to produce lasting impacts. A common limitation in these efforts was their minimal use of behavioural science frameworks to drive engagement and long-term effectiveness (Day et al. 2022; Croker et al. 2012).

As digital engagement continues to grow, LMICs present unique challenges and opportunities for applying such lessons. In these settings, social media platforms can serve as cost-effective tools for overcoming barriers to traditional healthcare, disseminating evidence-based nutrition information, enabling community participation, and promoting food security and health equity (Hagg et al. 2018; Abdulwaliyu et al. 2023a). However, LMICs face specific

structural issues, including digital literacy gaps, misinformation, unequal access to technology, and cultural relevance - factors that must be addressed to unlock the full potential of social media in health promotion.

In this narrative review, the existing evidence base on the use of social media for promoting public health nutrition in LMICs is critically discussed. In particular, it discusses the ways in which digital media have been used to address malnutrition, improve food security, and support health equity (Abdulwaliyu et al. 2023b). Additionally, the review identifies the main enablers, determines best practices, and provides recommendations for future research, practice, and policy.

## METHODS

This study adopts a narrative review approach. Relevant literature was identified through a systematic search of electronic databases including PubMed, Scopus, Web of Science, and Google Scholar, covering publications from 2000 to 2025. The search strategy used combinations of the following keywords and Boolean operators: (“social media” OR “digital platforms” OR “mobile technology”) AND (“public health” OR “health promotion” OR “health communication”) AND (“nutrition” OR “diet” OR “dietary behaviour”) AND (“LMICs” OR “developing countries” OR “Africa” OR “Asia” OR “Global South”). We included regional terms like “Africa” and “Asia” to capture studies that may not have explicitly used the “LMIC” label, and we added “Global South” to account for conceptual and policy-based literature that uses broader socio-political classifications.

In addition to peer-reviewed journal articles, relevant grey literature and policy briefs (e.g., reports from the World Health Organization (WHO), the World Economic Forum, and academic institutions) were included. Reference lists of key publications were manually screened to identify additional relevant studies.

While formal quality appraisal tools were not applied due to the narrative and conceptual nature of the review. Sources were evaluated based on methodological rigour, relevance, and recency. Nonetheless, the narrative review design may introduce selection bias and does not offer the replicability of systematic reviews or meta-analyses.

## RESULTS AND DISCUSSION

### HARNESSING SOCIAL MEDIA FOR PUBLIC HEALTH NUTRITION CAMPAIGNS

Public health professionals, healthcare professionals, health promotion agencies, and non-governmental organisations (NGOs) are leveraging the ever-changing, user-activated nature, and expansive reach of virtual spaces to deliver targeted health education, conduct community-level interventions, and facilitate interactive, people-focused debate (Hagg et al. 2018; Chen and Wang, 2021; Jafar et al. 2023). By accessing the real-time, user-activated space of societal networks, these stakeholders are able to conduct expedient, context-adjusted communication strategies that complement traditional outreach methods.

National and global public health agencies, like WHO, have embraced social media as part of their communication toolbox, which has enhanced the transparency and reach of

health promotion interventions (Zeng et al. 2025; Ventola, 2014). Such web activities have helped enhance public knowledge about key health concerns, uptake of health interventions, and open, bidirectional communication between health authorities and populations (Jeyaraman et al. 2023; Ventola, 2014). More particularly, social media interventions have been associated with heightened health literacy, behaviour change, and access to supportive educational and peer networks. In India, voluntary organisations, research groups, international bodies such as the United Nations Children's Fund (UNICEF) have also been instrumental in driving advocacy efforts (Pyle and Greiner, 2003). These include engaging stakeholders across diverse government departments to help them envision and fulfil their roles in executing national food security strategies and nutrition policies (Gavaravarapu, 2019).

Indonesia's #PrettyandPicky campaign for adolescent girls has demonstrated the successful application of social media in public health nutrition efforts. The campaign effectively promoted awareness and the adoption of healthy eating habits through engaging, culturally resonant visual content (Januraga et al. 2020). This case study illustrates the power of user-centred design, visual storytelling, and interactive elements – hallmarks of effective digital health communication (Zeng et al. 2025). The key messages for the social media-based campaign were grouped into specific themes: (i) increasing fruit, vegetable, and water intake, (ii) reducing sugar, salt, and fat intake, and (iii) assessing food composition and labels. The campaign used a dual strategy - an online social media programme as its core, supported by offline activities that reinforced its messages. Although Indonesia is now classified by the World Bank as an upper-middle-income country (as of 2023), it was considered a LMIC at the time of the #PrettyandPicky intervention. This context is important when evaluating the campaign's scalability and relevance to similar low-resource settings.

A critical marker of successful public health communication strategies is the inclusion of formative research prior to programme design, which ensures that interventions are both contextually relevant and evidence informed. This principle is emphasised in a review by Gavaravarapu et al. (2017), which examined nutrition education and communication interventions aimed at improving micronutrient intake across various age groups in India. This need for evidence-based design is particularly relevant for social media interventions. Grounding health communication initiatives in robust formative research is essential to maximise their impact. A systematic review by Seiler et al. (2022) reinforces this point, revealing that while social media-based health behaviour interventions in LMICs show considerable potential, they frequently suffer from a lack of theoretical grounding and conceptual clarity. These shortcomings continue to compromise the long-term effectiveness of digital interventions, limiting their ability to drive sustainable improvements in nutritional behaviours and food security (Abdulwaliyu et al. 2023a).

To strengthen the design, implementation, and sustainability of such initiatives, it is vital to incorporate established behavioural change models – such as the Health Belief Model, Theory of Planned Behaviour, or Social Cognitive Theory. These frameworks provide structured

approaches that account for individuals' motivation, perceived barriers, and readiness for change, ultimately improving the validity and durability of intervention outcomes (Alyafei and Easton-Carr, 2024; McManus et al. 2018). When applied effectively, they can significantly enhance the impact of digital strategies aimed at advancing health equity, especially in resource-constrained environments.

#### LEVERAGING SOCIAL MEDIA TO ENHANCE FOOD SECURITY - COMMUNITY MOBILISATION AND POLICY INFLUENCE IN LMICS AND BEYOND

Food security, as defined by FAO, exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life (Gibson, 2012). While food insecurity is recognised as a pressing global health challenge, it disproportionately affects populations in LMICs. For example, the number of people in LMICs experiencing food insecurity rose by 118.7 million between 2021 and 2022 (Zereyesus and Cardell, 2022).

Although empirical research on the effectiveness of social media in driving food policy reform and coordinating community response remains limited, emerging evidence supports its value as a digital infrastructure for mobilising support and bridging access gaps. Platforms such as Facebook have been shown to facilitate the formation of mutual aid groups, enabling vulnerable individuals to connect with resources, share lived experiences, and collectively address localised food insecurity (Charilaou and Vijaykumar, 2021).

The World Food Programme (WFP) plays a critical role in addressing food insecurity worldwide, especially in emergency-prone LMICs. In collaboration with governments, UN agencies, NGOs, and the private sector, WFP works to influence food systems and policies, enhance emergency preparedness, and improve nutrition outcomes. To support its objectives and engage global audiences, WFP maintains a broad and active social media presence. These platforms are used to raise awareness, mobilise resources, advocate for policy change, and share success stories and urgent needs in real time (WFP, 2023).

In recent years, social media has similarly transformed local food relief efforts, especially in LMICs. Digital platforms have enabled food banks and charitable food services to expand their reach, foster community engagement, crowdsource essential items, and advocate for structural change. For instance, the Lagos Food Bank Initiative supports vulnerable populations across Nigeria – a country facing widespread household food insecurity (Lagos Food Bank Initiative, n.d.). The organisation strategically uses Instagram not only to issue donation appeals but also to raise awareness about ongoing initiatives, amplify community impact, and advocate for long-term solutions.

Likewise, Food Banking Kenya has effectively harnessed social media to drive grassroots engagement. Their “Food Drive” campaign uses social media platforms to promote impactful food collection events at local supermarkets nationwide. Moreover, Food Banking Kenya aligns its messaging with the United Nations Sustainable Development

Goal 2: Zero Hunger, frequently using the hashtag #ZeroHunger to highlight its commitment to ending food insecurity (Food Banking Kenya, 2025).

As demonstrated in LMICs, where traditional food assistance systems may be fragmented or under-resourced, the integration of social media into public health nutrition strategies offers a promising, cost-effective approach to improve food security outcomes. By harnessing the participatory and amplifying power of digital platforms, communities can not only respond more effectively to immediate nutritional needs but also advocate for systemic change aimed at enhancing food system resilience and health equity.

#### INFLUENCING DIETARY BEHAVIOURS AND NUTRITIONAL OUTCOMES VIA SOCIAL MEDIA

Social media platforms have emerged as influential tools in shaping dietary behaviours across diverse populations (Tobey et al. 2016; Januraga et al. 2021). A recent survey conducted by the British Nutrition Foundation (2023) revealed that 56% of respondents expressed a willingness to alter their dietary practices based on content encountered through social media. This finding aligns with a growing body of literature, particularly among adolescents and young adults (Cassidy et al. 2021; Bragg et al. 2018; Rounsefell et al. 2020).

Fast food consumption is rising at an alarming rate within LMICs, as exemplified by recent findings showing that 55.5% of adolescents aged 12 to 15 across 54 LMICs consume fast food at least once a week (Bankole et al. 2024). Social media platforms play a significant role in driving this trend, with fast food companies utilising these channels to target young, lower-income consumers (Cassidy et al. 2021; Mkumbo and Mbise, 2022). For example, Bragg et al. (2018) observed that in India, healthier menu options were rarely promoted to children from low-income households, showing a skewed marketing approach. Likewise, McDonald's has used Instagram to reach millions of consumers across LMICs, while Bankole et al. (2024) documented how five fast food brands in Nigeria posted emotionally charged content, teen-focused language, and appealing imagery to engage adolescents on Instagram (Cassidy et al. 2021). Furthermore, hashtag strategies, widely known to increase reach and engagement, were also used to enhance visibility.

In contrast to the commercial exploitation of social media, several studies, mostly from high-income settings, have explored its potential for improving nutritional outcomes, particularly around fruit and vegetable consumption, which are central to the prevention of non-communicable diseases such as obesity, hypertension, and cardiovascular disease (Duthie et al. 2018). For example, Ng et al. (2022) conducted a four-week Mediterranean Diet challenge via Facebook, incorporating infographics, cooking demonstrations, and food literacy-oriented materials. Participants exhibited substantial improvements in food literacy (ranging from 21% to 45%) and increased their daily intake of fruits and vegetables by 0.6 and 1.3 servings, respectively. Similarly, Hawkins et al. (2024) documented an increase of 1.37 servings per day among university students who participated in a two-week Instagram-based intervention.

While these findings are promising, they must be interpreted with caution. Many of the reported improvements rely on self-reported dietary data, which is susceptible to social desirability and recall biases that may compromise data reliability (Latkin et al. 2017). Furthermore, not all social media-based interventions have yielded statistically significant results. In a randomised controlled trial, Carreño Enciso et al. (2024) observed no meaningful changes in fruit and vegetable intake following a Facebook and Instagram campaign targeting university students. The authors attributed this to a lack of interpersonal engagement, a factor also highlighted by Al-Awadhi et al. (2021) and Jabbari et al. (2024), who found that interventions incorporating direct interpersonal interaction tended to achieve greater behavioural impact. Although insights from high-income countries can inform understanding, they must be cautiously interpreted and adapted, given the differing cultural, economic, and infrastructural realities in LMICs

#### EXPANDING NUTRITION EDUCATION THROUGH E-LEARNING

Online learning sites can democratise access to nutrition education, especially in resource-poor environments where conventional pedagogical methods are usually limited. Internet-based resources not only facilitate knowledge dissemination but also unify the quality of instruction across locations. A good example is the FAO E-Learning Academy, which provides a free, multilingual course package on nutrition, food security, and health (FAO E-Learning Centre, 2019). Extending these international efforts, the Early Nutrition Specialist Programme, provides a structured, evidence-based curriculum through six interactive modules. The three-year assessment of the program indicated high satisfaction among users, perceived relevance, and globalizability (Brands et al. 2021).

There have been encouraging outcomes of e-health interventions on small scales. For instance, a web-based nutrition education program for low-income rural families in Maryland, USA, achieved high user engagement and had potential for obesity prevention through community-tailored web-based content (Atkinson et al. 2009).

Yet, scalability and efficacy of these programs in LMICs are moderated by structural impediments. Infrastructural deficiencies – unreliable internet access, malfunctioning digital equipment, and precarious electrical supply – are significant concerns to grapple with (Abbas et al. 2024; Jafar et al. 2024; Gaidelys et al. 2022). These are compounded by a lack of interactive instructional design suited to asynchronous, bandwidth-constrained environments. One multi-national cross-sectional survey of health sciences students in LMICs described mainly negative experiences of e-learning platforms, with a lack of interactivity and logistical problems being identified as areas of dissatisfaction (Abbas et al. 2024).

Therefore, although online learning platforms have enormous potential to build workforce capacity in nutrition and help reverse the double burden of malnutrition, their success will depend on parallel investments in digital infrastructure, local content creation, and context-dependent implementation strategies. In the absence of attention to these fundamental needs, the potential of e-learning to revolutionise global nutrition education may go

unrealised in some of the very settings where it is most desperately needed (Wang et al. 2025).

#### HARNESSING SOCIAL MEDIA TO ADDRESS MATERNAL AND CHILD MALNUTRITION

Internet-based interventions using social media platforms to lower maternal and child malnutrition have attracted attention in recent years, both in terms of great potential and contextual constraints. For example, Williams et al. (2019) concluded, based on a feasibility study, that private Facebook groups were a viable platform for the provision of personalised health messages to pregnant women, with the potential to promote healthy gestational weight gain and long-term maternal and infant health outcomes. In an example from Florida, a focused intervention involving a private Facebook group brought measurable food behaviour changes among low-income pregnant women; decreased intake of sugar-sweetened drinks, increased utilisation of food labels, and more nutritious diets in general (Gray et al. 2022).

Some LMIC-based studies have begun to evaluate similar approaches. Fiorella et al. (2019) assessed a 12-week social network intervention on Mfangano Island, Kenya, which involved multiple community members, such as fathers and grandmothers, in an effort to enhance infant and young child feeding practices. Although the intervention had no measurable impact on dietary diversity, meal frequency, or the proportion of children meeting minimum acceptable diet criteria, it significantly increased nutrition knowledge and confidence among caregivers and community health workers. A further example from Ghana, the Breastfeed4Ghana campaign, employed Facebook and Twitter to promote breastfeeding knowledge and awareness (Harding et al. 2020). While the campaign was deemed highly feasible and broadly acceptable, reaching nearly half of surveyed participants by the endline, knowledge outcomes were less promising. A majority of participants could not recall the campaign's objective, and exposure did not correlate with improved breastfeeding knowledge. These results underscore the challenges of translating social media reach into behavioural change, especially when message clarity or reinforcement mechanisms are limited.

These studies reinforce an emerging global consensus: social media and digital platforms should function as complementary tools, rather than standalone solutions, in maternal and child nutrition strategies. This position is supported by UNICEF guidance, which advocates for the integration of digital platforms with in-person counselling to improve program reach, engagement, and impact in resource-constrained settings (UNICEF, 2021). Leveraging the strengths of both modalities offers a more robust framework for advancing nutrition outcomes in LMICs.

However, acceptance of social media use for maternal and child health promotion is still cautious among some communities, mirroring fears regarding the truthfulness of information and the trustworthiness of social media websites. For example, a mixed-methods study conducted among Hispanic women in the US revealed pervasive distrust regarding the credibility of child health information relayed through social media websites (Griauzde et al. 2019). This reluctance mirrors that of previous studies (Criss et al. 2015;

Stroeve et al. 2011), which similarly uncovered worries regarding misinformation and perceived credibility of online sources (Onyemachi and Okoduwa 2022). Notably, although participants were sceptical of the credibility of information on social media, they were also keen to access health and nutrition information—just as long as it was from credible professionals (Griauzde et al. 2019).

These insights highlight a critical challenge in the digital health space: building trust and ensuring credibility for online content. For social media interventions to be effective in addressing maternal and child malnutrition, particularly within low-resource contexts, developers must prioritise culturally relevant content, engage reputable health professionals, and leverage community-based influencers to enhance user confidence and engagement.

#### BARRIERS AND ETHICAL CHALLENGES IN LEVERAGING SOCIAL MEDIA FOR PUBLIC HEALTH NUTRITION IN LMICS

While social media has indisputably become an indispensable tool in contemporary public health practice, its application in health education, promotion, and intervention campaigns is not without significant challenges. These include persistent digital inequities, the proliferation of misinformation, the risk of virtual aggression, and ethical considerations related to autonomy and manipulation. Together, these obstacles threaten to undermine the potential of digital platforms to advance public health nutrition, particularly in LMICS.

#### THE DIGITAL DIVIDE

The uneven distribution of digital infrastructure and technological resources, commonly referred to as the “digital divide,” remains a critical constraint on the equitable use of social media in public health. Access to and utilisation of digital platforms are strongly correlated with a country’s gross national income per capita (Hagg et al. 2018; Jafar et al. 2024; Bhojar et al. 2024). Although LMICS have historically experienced lower levels of internet access and smartphone penetration, recent advancements have driven a phenomenon known as “technological leapfrogging.” This process, defined as the adoption of advanced technologies while bypassing earlier stages, has been facilitated by cost-effective innovations such as mobile networks, enabling many African and South Asian countries to expand wireless connectivity without widespread reliance on fixed-line infrastructure (Hagg et al. 2018; Okoduwa, 2017).

Nonetheless, significant disparities remain. As of 2023, smartphone penetration in high-income regions such as North America and Europe stood at approximately 86% and 82%, respectively, compared to just 55% in Sub-Saharan Africa (Laricchia, 2024). This gap in mobile internet access is further emphasised in Table 3, which details mobile connectivity trends in Sub-Saharan Africa from 2019 to 2023. While the coverage gap – referring to populations that do not live within the footprint of a mobile broadband network – declined from 23% to 13%, the percentage of the population connected – those actively using mobile internet services – increased from 20% to 27%, and the usage gap remained largely unchanged. The usage gap refers to populations who live within the footprint of a mobile broadband network but are not using mobile internet, highlighting persistent

barriers to effective utilisation such as affordability, digital literacy, and lack of access to smartphones or internet-enabled devices. Furthermore, the digital divide extends beyond access to include digital literacy – the ability to locate, interpret, and critically evaluate online information (American Library Association, 2011; Del Pilar Arias López et al. 2023). Even where access exists, disadvantaged populations may lack the competencies necessary to leverage digital tools for health-related purposes, often limiting their use to entertainment (Jafar et al. 2024). For instance, a study conducted in Ethiopia revealed limited digital competence among healthcare providers, particularly in areas such as digital communication, problem-solving, and cybersecurity (Shiferaw et al. 2020; Onyemachi and Okoduwa, 2022).

**Table 1. Mobile Internet Connectivity in Sub-Saharan Africa from 2019 to 2023.** Based on the findings of GSMA, 2024.

Year	Percentage (%)		
	Coverage Gap	Usage Gap	Connected
2019	23	57	20
2020	19	59	22
2021	17	60	23
2022	15	59	25
2023	13	60	27

‘Usage gap’ refers to populations that live within the footprint of a mobile broadband network but who are not using mobile internet. ‘Coverage gap’ refers to populations that do not live within the footprint of a mobile broadband network. ‘Connected’ includes individuals actively using mobile internet services

#### MISINFORMATION AND CONTENT CREDIBILITY

A pervasive challenge in using social media for health promotion is the rampant spread of misinformation. Unlike traditional media, social platforms are minimally regulated, allowing individuals – regardless of expertise or professional background—to share content that ranges widely in quality and accuracy (de Vere Hunt and Linos, 2022; Denniss et al. 2024; Ventola, 2014). The World Economic Forum highlighted digital misinformation as one of the foremost global risks as early as 2013 (Denniss and Lindberg, 2025). Numerous studies have since documented the widespread dissemination of substandard or misleading nutritional information on platforms such as Instagram, YouTube, X, and TikTok (Zeng et al. 2025; Denniss et al. 2023; Raggatt et al. 2018; Gongane et al. 2022).

Some platform operators implemented content moderation policies (though some have recently greatly reduced this), but most initiatives have centred on political or general medical misinformation, with less attention paid to the specific domain of nutrition and dietary health (Zeng et al. 2025). Notably, evidence indicates that the most accurate and credible nutrition content is typically produced by healthcare professionals, researchers, and institutional bodies such as the Centers for Disease Control and Prevention, the American Dietetic Association, and WHO (Denniss et al. 2024; Fernández et al. 2025). However, as observed by Kostygina et al. (2020), such content often lacks the visual appeal and engagement-focused strategies employed by influencers, resulting in significantly lower reach and impact. This is further substantiated by findings from Habibi et al. (2021) and Barklamb et al. (2020), who

noted that influencer-driven content outpaces evidence-based messaging in both popularity and influence, despite its often questionable accuracy.

#### *VIRTUAL AGGRESSION- AND PROFESSIONAL RETALIATION*

Another emerging concern is the rise of online hostility and aggression directed at healthcare professionals and public health institutions. The digital environment can foster anonymity and rapid feedback loops, sometimes resulting in harassment, abuse, or reputational attacks in response to health-related posts (Larkin, 2021; Dolezal et al. 2021; Royan et al. 2023). In a mixed-methods study, La Regina et al. (2021) documented episodes of online abuse targeting healthcare departments and professionals on Facebook, reflecting a broader pattern of resistance or backlash against evidence-based health communications. Such hostility not only threatens the well-being of health professionals but may also deter the dissemination of vital public health messages, thereby impeding efforts to promote nutrition and disease prevention in digital spaces (Royan et al. 2023).

#### *ETHICAL CONSIDERATIONS IN DIGITAL HEALTH MESSAGING*

Ethical considerations must remain central in the use of social media for public health nutrition. One of the core ethical principles in public health communication is respect for individual autonomy – the right of individuals to make informed decisions regarding their health, even in the face of potential personal risk (Murphy et al. 2024; Zimmerman, 2017). Health messaging should aim to inform, support, and educate through transparent, evidence-based information, rather than to manipulate or coerce behavioural choices.

Murphy et al. (2024) suggest that such an approach aligns with Self-Determination Theory, which identifies autonomy, competence, and relatedness as critical to sustained behavioural change (Patrick and Williams, 2012). While certain public health threats may necessitate more assertive interventions, these should remain exceptions. As digital health strategies become increasingly targeted and personalised, it is imperative to ensure transparency in messaging – clearly identifying the source, rationale for targeting, available support services, and mechanisms for opting out. Upholding these ethical standards not only protects individual rights but also enhances the credibility and long-term impact of public health initiatives.

Furthermore, while social media provides unique avenues for health communication, it also raises concerns around autonomy and persuasion, especially in resource-limited settings. Interventions that use persuasive design (e.g., nudges, gamification, emotional appeals) must be scrutinised for their ethical implications—particularly when targeting nutritionally vulnerable populations with limited access to alternative sources of information. In LMICs, where power asymmetries and low health literacy are common, poorly regulated digital messaging can unintentionally coerce rather than empower (Zimmerman, 2017; Murphy et al. 2024).

Recent frameworks, such as the Digital Health Ethics Charter, advocate for balancing behavioural change goals with informed consent, transparency, and cultural relevance. Ensuring that users understand who is delivering the message, the evidence base behind the content, and their

right to opt out of digital health messaging is essential to upholding autonomy and trust (WHO, 2023; Patrick and Williams, 2012).

#### COMMERCIAL DETERMINANTS OF DIGITAL FOOD ENVIRONMENTS: THE ROLE OF ULTRA-PROCESSED FOOD MARKETING

In the rapidly evolving digital landscape, the pervasive presence of ultra-processed food (UPF) marketing on social media represents a powerful and often underexamined barrier to public health nutrition in LMICs. These platforms have become lucrative advertising spaces for multinational food and beverage companies, who strategically target young, digitally active populations in emerging markets with highly engaging, culturally tailored campaigns (Da Silva et al. 2021; Mallarino et al. 2013).

Studies have shown that UPF brands utilise influencers, viral challenges, gamification, and algorithmically optimised content to promote products high in sugar, salt, and fat – often directly competing with public health messaging (Fretes et al. 2025). In LMICs, where regulatory frameworks for digital marketing remain weak or absent, these campaigns can significantly undermine efforts to promote healthy dietary behaviours.

In South Africa, for example, a content analysis of Instagram and YouTube campaigns by multinational snack brands revealed that over 70% of ads featured emotional appeals, national pride, or family values, with little to no nutritional information disclosed (Bissoon 2022). Similarly, research from India found that adolescent-targeted junk food ads on Facebook often mimicked public service announcements by using health-related hashtags and local language slogans, blurring the line between commercial and educational content (Vaughan et al. 2025).

The commercial saturation of digital food environments is especially problematic given its disproportionate impact on vulnerable populations, including children and low-income users with limited media literacy. It also contributes to the nutrition transition underway in many LMICs, marked by rising rates of overweight and diet-related noncommunicable diseases alongside persistent undernutrition (Popkin et al. 2019).

To counter these commercial influences, public health strategies must extend beyond content creation to include policy advocacy for digital food marketing regulation, influencer accountability, and platform responsibility. A growing number of international bodies, including WHO and UNICEF, have called for binding restrictions on the marketing of unhealthy foods to children in digital spaces – a recommendation yet to be widely implemented, including in LMICs (Paglia, 2023; WHO, 2023; UNICEF East Asia and the Pacific Regional Office, 2024).

Integrating this regulatory perspective is critical to ensuring that social media does not merely become another vector for dietary harm, but rather a platform for equitable and health-promoting communication.

#### BRIDGING THE DIGITAL DIVIDE AND COMBATING MISINFORMATION: MAXIMISING THE IMPACT OF SOCIAL MEDIA IN PUBLIC HEALTH NUTRITION

The expanding role of social media in public health underscores the critical need to address the digital divide

through a coordinated, multi-sectoral response. Equitable access to digital platforms must be recognised as a social determinant of health, particularly in LMICs, where infrastructural and socioeconomic disparities limit access to digital health resources. Governments and development partners should prioritise the implementation of inclusive digital health policies that promote universal connectivity, particularly in underserved and rural communities. This entails strategic public-private partnerships to invest in digital infrastructure, ensure affordability of internet services and mobile devices, and integrate digital access into broader health and development agendas.

Equally vital is the promotion of digital literacy across diverse population groups. Empowering individuals to access, evaluate, and utilise digital content effectively requires the implementation of accessible education and training programme, particularly targeting vulnerable populations with limited prior exposure to digital technologies. Digital literacy not only enhances individual capacity to engage with health information but also fosters community-level resilience against health misinformation.

Despite the growing presence of healthcare professionals and institutions on social media, their content often struggles to compete with algorithmically amplified misinformation and non-evidence-based narratives. This limited visibility of credible nutrition content presents a significant barrier to effective public health communication. To address this, healthcare professionals must be equipped with skills in digital storytelling and content creation, utilising tools such as short-form videos, engaging visuals, and platform-specific trends to improve reach and resonance. Furthermore, strategic collaborations with trusted community influencers and digital content creators can enhance the appeal and dissemination of evidence-based messages, translating scientific guidance into accessible, culturally relevant content.

Combating misinformation remains an urgent and ongoing priority. Social media platforms should implement robust mechanisms to authenticate the credentials of individuals disseminating nutrition and health-related content. Features such as verified professional badges, disclaimers, and transparency indicators can aid users in distinguishing credible sources. Additionally, algorithmic moderation, real-time fact-checking, and the integration of expert panels for content review—as sometimes has been adopted in political and COVID-19-related information streams—should be extended to nutrition and broader public health content. Finally, enhancing health literacy must be approached as a shared societal responsibility. Coordinated efforts involving educational institutions, health ministries, civil society, and social media companies are essential to cultivate critical thinking and information discernment skills from an early age. Such initiatives, particularly in LMICs, will help mitigate the adverse impacts of misinformation and ensure that digital technologies serve as catalysts for equitable and sustainable health improvements.

#### POLICY RECOMMENDATIONS FOR STRENGTHENING SOCIAL MEDIA-BASED PUBLIC HEALTH NUTRITION INTERVENTIONS IN LMICs

To harness the full potential of social media as a vehicle for promoting public health nutrition in LMICs, a

comprehensive and coordinated policy framework is essential. The following policy recommendations offer strategic directions for governments, public health agencies, multilateral partners, and digital platforms to collaboratively address existing gaps and maximise impact.

#### 1. *INTEGRATE DIGITAL HEALTH INTO NATIONAL NUTRITION AND HEALTH STRATEGIES*

Governments should embed digital health components – including social media engagement – within national public health and nutrition policies. This involves recognising social media as a legitimate tool for health communication and investing in its integration with traditional healthcare systems. Policy frameworks should provide guidance on ethical digital engagement, culturally tailored content development, and the use of social media analytics for public health surveillance and programme monitoring.

#### 2. *INTEGRATE DIGITAL INCLUSION INTO NATIONAL NUTRITION STRATEGIES*

Nutrition interventions in LMICs must be supported by national digital inclusion frameworks that ensure equitable internet access, digital literacy, and infrastructure development. Governments should work with telecom companies, NGOs, and international agencies to subsidise data costs, expand mobile network coverage in rural areas, and offer nutrition content through zero-rated platforms. Evidence shows that multi-sector digital partnerships can increase both the reach and impact of public health campaigns when integrated into national policy (Bhojar et al. 2024; Gaidelys et al. 2022).

#### 3. *INSTITUTIONALISE DIGITAL LITERACY AND HEALTH MEDIA EDUCATION*

National education curricula should include digital literacy and health information appraisal skills, beginning at the primary and secondary school levels. Health ministries, in collaboration with educational institutions and community organisations, should also implement adult-focused digital literacy programmes to ensure broad societal engagement in digital health ecosystems.

#### 4. *ESTABLISH GUIDELINES FOR HEALTH CONTENT CREDIBILITY AND PLATFORM ACCOUNTABILITY*

Governments and international health bodies should develop and disseminate standardised guidelines for digital health communication, including requirements for evidence-based content, source transparency, and ethical engagement. Social media platforms should be held accountable for enforcing these guidelines, with policies mandating the verification of health professionals, flagging of dubious content, and routine collaboration with fact-checking entities.

#### 5. *SUPPORT CAPACITY BUILDING FOR HEALTH PROFESSIONALS IN DIGITAL COMMUNICATION*

Health professionals and public health workers require targeted training in digital communication strategies, including content creation, audience engagement, and behaviour change communication tailored to social media platforms. Continuing professional development

programmes should include modules on leveraging social media for health promotion, with incentives for participation.

#### 6. ENCOURAGE MULTISECTORAL COLLABORATION AND COMMUNITY-LED ENGAGEMENT

Policies should promote collaboration between health agencies, local governments, academic institutions, community influencers, and civil society organisations. Community-driven campaigns and participatory content development can enhance cultural relevance and ownership, increasing the effectiveness and sustainability of social media interventions.

#### 7. MONITOR, EVALUATE, AND RESEARCH SOCIAL MEDIA INTERVENTIONS

Rigorous monitoring and evaluation mechanisms are necessary to assess the reach, engagement, and outcomes of social media-based nutrition interventions. Governments and funding agencies should invest in implementation research and data systems that capture both quantitative and qualitative impacts, guiding evidence-based policy adjustments and scale-up strategies.

### CONCLUSION AND FUTURE DIRECTIONS

As digital technologies continue to permeate all facets of society, social media has emerged as a powerful and increasingly indispensable tool in the promotion of public health nutrition, particularly in LMICs. Its capacity to transcend geographic, economic, and institutional barriers offers unprecedented opportunities to disseminate evidence-based nutrition information, foster community engagement, and promote health equity. However, realising this potential requires strategic, inclusive, and ethically grounded approaches that address systemic digital inequities and counteract the growing threat of misinformation.

The findings of this narrative review suggest the need for integrated, multisectoral policy frameworks that position social media as a core component of national and regional public health strategies. Investment in digital infrastructure, literacy, and content quality must be prioritised alongside efforts to build trust and credibility through verified, culturally resonant communication. Moreover, empowering health professionals and communities with the tools and training necessary to engage meaningfully on digital platforms is essential for sustainable impact.

Looking ahead, there is an urgent need for robust implementation research to assess the effectiveness, scalability, and contextual adaptability of social media-driven nutrition interventions. Future studies should explore the long-term behavioural and health outcomes associated with such campaigns, the differential impacts across population subgroups, and the role of emerging technologies such as artificial intelligence, chatbots, and mobile health integration.

This review highlights that meaningful nutrition outcomes in LMICs increasingly depend on the integration of digital inclusion strategies with public health nutrition programming. Bridging digital divides is not just a technological concern but a health equity imperative. Public health initiatives must therefore consider digital access, affordability, and digital literacy as foundational components of nutrition intervention design. Without such integration, digital solutions may exacerbate existing disparities rather than ameliorate them (de Vere Hunt and Linos, 2022; Abbas et al. 2024).

In a rapidly evolving digital landscape, the public health community must remain agile, collaborative, and proactive in leveraging social media not only as a channel for information dissemination but also as a transformative tool for advocacy, empowerment, and social change. By harmonising technological innovation with public health goals, LMICs can accelerate progress toward improved nutrition, greater food security, and health equity for all.

#### AUTHOR CONTRIBUTIONS

The conceptualisation, study design, writing, review and editing of the manuscript for important intellectual content was done by SIRO. The literature search, synthesis and writing of the original manuscript draft was done by KB. Both authors read and approved the final version of the revised paper and gave consent for its submission and publication.

#### CONFLICT OF INTEREST

The authors are volunteers working with the journal but played no part in deciding on whether the manuscript was to be accepted. It was peer reviewed and edited independently.

#### DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN SCIENTIFIC WRITING

The authors declare that no generative AI or AI-assisted technologies were used in the writing, editing, data analysis, or production of this manuscript, unless otherwise explicitly acknowledged. Where AI tools were used, such usage was limited to language refinement and formatting assistance under the direct oversight of the authors, who remain fully responsible for the content and integrity of the manuscript.

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