Food and Nutrition Literacy: Public Health Implications

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Abstract

Food and nutrition literacy (FNLIT) is a multifaceted concept that encompasses the knowledge and skills related to maintaining balance, sustainability, health-promoting food and nutrition, and well-being. This literacy is critical in enabling populations to navigate complex food environments, understand nutritional information, and apply it to everyday dietary practices. Public health implications of FNLIT are profound, as

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higher literacy levels are associated with better dietary habits, reduced risk of chronic diseases, and overall improved health outcomes. The intersection of FNLIT with socioeconomic factors, education, and access to resources highlights the need for comprehensive public health strategies. These strategies should aim to enhance FNLIT through targeted educational programs, policy initiatives, and community-based interventions. Such efforts can empower individuals to make healthier food choices, ultimately contributing to the reduction of health disparities and the promotion of equitable health across diverse populations.

Keywords

Food literacy · Nutrition literacy · Health literacy · Nutrition · Diet · Decision-making · Health policy · Public health

Abbreviations

CSA	Community-supported agriculture
FAO	Food and Nutrition Organization
FL	Food literacy
FNLIT	Food and nutrition literacy
NL	Nutrition literacy
SDG	Sustainable development goals
UN	United Nations
WHO	World Health Organization

Introduction

The global landscape is progressively growing intricate. It is hard to keep up with the constant influx of information from social media, news outlets, and other sources. Individuals worldwide grapple with uncertainty regarding dietary preferences for optimal health. Despite seeking evidence-based guidance, individuals are overwhelmed by the sheer volume of data, leading to skepticism and indecision. Perceptions of incongruity among scientists and their fluctuating stances further compound this issue. The abundance of dietary recommendations and exercise prescriptions presents a formidable task even for the most educated individuals to decipher, potentially resulting in uninformed decisions with detrimental health implications (Silva 2023).

Food/nutrition literacy is a crucial aspect of health literacy by enabling individuals to make well-informed decisions and food selections related to their well-being. In addition, regarding environmental sustainability, food/nutrition literacy encompasses developing critical thinking skills and consciousness regarding the correlation between food consumption and the ecosystem. The components emphasized in food/nutrition literacy are effective in building capacity and empowering people to maintain and sustain the environment, food and agriculture system, and sustainable nutrition (Lisciani et al. 2024). Despite the increasing recognition of the significance

of food/nutritional literacy, this issue persists on a global scale, impacting individuals of all ages, backgrounds, and socioeconomic status. Food/nutritional illiteracy has substantial health implications by contributing to disparities in health, particularly among vulnerable populations. In addition, food/nutritional literacy is a complex and interdisciplinary domain that presents multiple obstacles to health communication. These obstacles must be addressed to promote nutritional literacy effectively and improve health outcomes.

In this chapter, firstly food literacy and nutrition literacy concepts were defined, and the differences between them often wrongly used as synonyms were explained. Subsequently, determinants and consequences within the food system were identified in a conceptual framework, and the public health implications of illiteracy were discussed. Finally, an elucidation of strategies, policies, and programs aimed at enhancement was provided.

History and Evolution

"Food literacy" was first discussed in the United States in 1998 because of concerns over the decreasing ability of individuals to make healthy food choices, the increase in high-risk eating behaviors, and the decline in the health status of consumers. This concept emerged in contemporary nutrition policies and plans as early as 1990 and in published literature from 2001 as various aspects of knowledge and skills related to food, including food preparation and cooking skills, understanding food science, learning about household food production, awareness of food safety practices, and understanding of food marketing strategies, that individuals need to navigate the food environment and meet their nutrition and health needs (Truman et al. 2017).

The term "nutrition literacy" was first used in a study by Sullivan and Gottschall-Pass in 1995. The study aimed to assess the knowledge of nutrition information on food labels among healthy Canadians, which can be considered as evaluating their nutrition literacy (Sullivan and Gottschall-Pass 1995). Initially, nutrition literacy was used without a specific definition and fell under the broader term health literacy. However, the nutrition literacy definition has since evolved from a model developed by Don Nutbeam (Fig. 1). Nutbeam defined it as a combination of cognitive and social abilities that influence an individual's motivation and capacity to access, understand, and manage information necessary for maintaining good health (Nutbeam 2000). In this context, health literacy goes beyond being able to read labels or keep appointments; it involves making informed decisions about one's health (Nutbeam and Kickbusch 1998). Nutbeam identified three levels of health literacy: functional, interactive, and critical. Functional health literacy refers to basic skills, such as reading, understanding health messages, and acting upon the provided information. This level emphasizes the importance of knowing about health risks, and healthcare services, and following healthcare recommendations (Nutbeam 2000).

Interactive health literacy involves more advanced cognitive abilities that allow individuals to seek out and use health information based on their changing needs. At this level, individuals develop skills for lifestyle changes and effectively utilize

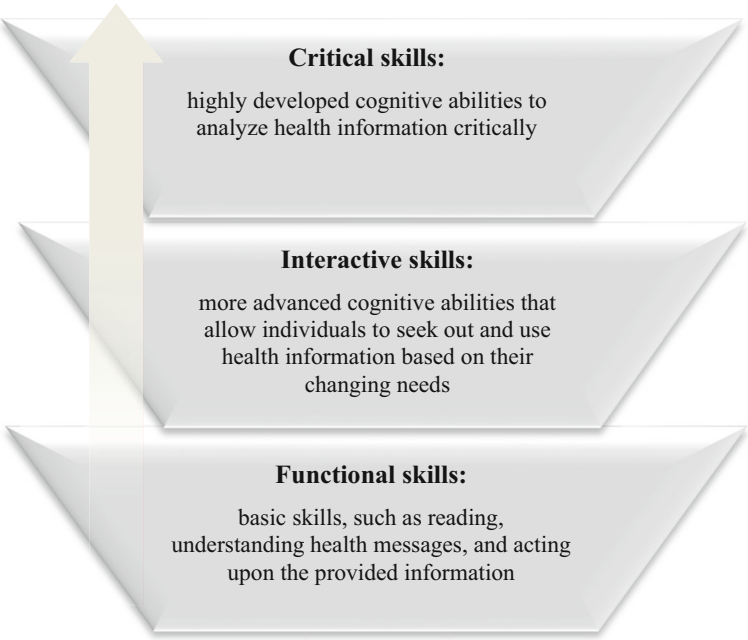

Fig. 1 Nutbeam's hierarchical model of health literacy

healthcare services. It also includes discussing information with healthcare professionals to make informed decisions (Nutbeam 2000). Critical health literacy is the most advanced level where individuals possess highly developed cognitive abilities to analyze health information critically. They use the results of their analysis to stay vigilant about their well-being and take control over life events (Nutbeam 2000).

Health Literacy Domains

The four domains of health literacy—basic literacy, scientific literacy, civic literacy, and cultural-ecological literacy—are integral to the development of food/nutrition literacy (Zarcadoolas et al. 2005; Turner 2020):

1. *Basic literacy*: It is foundational to all other forms of literacy and encompasses the ability to read, write, speak, and understand numerical information. In the context of food and nutrition literacy, basic literacy enables individuals to comprehend food labels, follow recipes, understand dietary guidelines, and interpret nutritional information. Without basic literacy skills, individuals may struggle to access and understand crucial information related to food and nutrition, hindering their ability to make informed dietary choices.

2. *Scientific literacy*: As food and nutrition involves complex biochemical processes within the body, scientific literacy is essential for understanding the physiological effects of different nutrients, dietary patterns, and food choices. Individuals with scientific literacy can critically evaluate nutrition research, understand the principles of metabolism and nutrient absorption, and apply scientific evidence to inform their dietary decisions. This literacy empowers individuals to distinguish between reliable nutrition information and pseudoscientific claims, enabling them to make evidence-based choices for their health.
3. *Civic literacy*: Civic literacy empowers individuals to engage in critical discussions, participate in decision-making processes, and advocate for policies that promote public health and nutrition. Within the realm of food and nutrition, civic literacy enables individuals to understand the societal implications of dietary choices, advocate for food policies that support public health goals, and engage in community-based initiatives to address nutrition-related disparities. By participating in civic discourse and policymaking, individuals can contribute to the development of nutrition solutions that benefit communities and promote equitable access to healthy food options.
4. *Cultural-ecological literacy*: Recognizing the influence of cultural beliefs, traditions, and ecological factors on food choices and dietary behaviors is essential for promoting culturally appropriate and sustainable nutrition practices. Cultural-ecological literacy enables individuals to understand the cultural significance of food, respect diverse dietary traditions, and adapt nutrition messages and interventions to align with cultural preferences and environmental contexts. By incorporating cultural-ecological perspectives into nutrition education and programming, individuals can enhance the relevance and effectiveness of interventions aimed at improving dietary behaviors and health outcomes within diverse communities (Berkowitz et al. 2005; Zarcadoolas et al. 2005).

By cultivating these various forms of health literacy, individuals can develop a comprehensive understanding of food and nutrition that encompasses scientific principles, societal dynamics, cultural contexts, and individual preferences, ultimately empowering them to make informed and health-promoting dietary choices (Turner 2020).

Food/Nutrition Literacy Concept

Nutrition literacy and food literacy are two linked concepts related to the ability to understand and apply knowledge about food (Krause et al. 2018). Understanding the differences between these concepts is crucial:

- *Nutrition literacy* is one of the most important components of health literacy, and all definitions related to it focus on individuals' cognitive abilities, basic literacy skills, and numerical skills required for understanding and using nutrition-related information (Krause et al. 2018). Researchers replaced the term "health" with

"nutrition" in defining nutrition literacy. Thus, nutrition literacy, sometimes mentioned as nutritional literacy, refers to individuals' capacity to access, process, and comprehend nutritional information, as well as their skills in making appropriate nutritional decisions (Zoellner et al. 2009).

- *Food literacy* encompasses the ability to receive, process, and understand basic information about food and nutrition and includes the application of this information. It involves assessing individuals' ability to prepare food, with an emphasis on their capacity and skill in selecting healthy foods and understanding the impact of these dietary choices on personal and societal health promotion and economic development (Vidgen and Gallegos 2014).

Nutrition literacy and food literacy coexist in the literature, while unclear borders exist between the two concepts. Consequently, challenges have arisen in evaluating the effectiveness of interventions focusing on nutrition literacy or food literacy (Krause et al. 2018). Some studies suggested conceptualizing nutrition literacy as a subset of food literacy and that both nutrition literacy and food literacy can be fruitfully framed as specific forms of the broader concept of health literacy (Krause et al. 2018). Based on the definitions, nutrition literacy, or nutritional literacy, focuses on understanding the roles of various nutrients in healthy eating habits and making nutritious food choices by reading nutrition labels, while food literacy goes beyond just nutrition and includes understanding social aspects such as food production methods, origins, and their impact on overall well-being.

Food consumption by individuals is associated with various health, environmental, and socioeconomic issues. The concepts of food literacy and nutrition literacy may not be sufficient to address these problems on a global scale. However, the food system plays a significant role in both environmental and socioeconomic contexts. It has the potential to promote health and sustainable diets or contribute to an unsustainable world. Previous studies have provided comprehensive definitions of food literacy and nutrition literacy from an individual perspective. However, there is a need for a more comprehensive model that takes into account public perspectives and recognizes the influential role of large-scale food distribution in shaping individuals' dietary quality.

Food and nutrition literacy (FNLIT) emphasizes the impact of the food system on both access to healthy eating options and adherence to them (Vettori et al. 2019). This conceptualization encourages researchers to consider a public perspective on food and nutrition literacy, prompting stakeholders to make decisions that contribute to a "mature" food system capable of promoting sustainability in diet and nutrition (Vettori et al. 2019):

- *Food and nutrition literacy (FNLIT)* refers to a set of knowledge, skills, and abilities related to planning, managing, selecting, preparing, and consuming food to achieve a balanced and sustainable diet. This approach, based on the concept of deep learning in educational theories, extends the outcomes of FNLIT beyond individual outcomes to include interpersonal, societal, and environmental outcomes (Vettori et al. 2019; Doustmohammadian et al. 2022b).

Food and Nutrition Literacy (FNLIT) Dimensions

Due to the interconnections between FNLIT concepts and their relationship with health literacy, FNLIT skills have been delineated within Nutbeam's health literacy framework at three functional, interactive, and critical levels:

- *Functional FNLIT*: At this level, individuals acquire basic information and understanding about food and nutrition. This includes knowledge of fundamental concepts such as the importance of a balanced diet, basic food groups, nutritional labels, portion sizes, and food safety practices. Functional food/nutrition literacy skills enable individuals to interpret and understand basic information related to food and nutrition, allowing them to make healthier choices in their daily lives.
- *Interactive FNLIT*: Building upon the functional level, interactive food/nutrition literacy involves the ability to use food-related information to actively participate in discussions, make informed decisions, and engage in behaviors that promote health and well-being. This level emphasizes skills such as effective communication with healthcare providers, asking relevant questions about food and nutrition, seeking out reliable sources of information, and critically evaluating food-related messages from various sources.
- *Critical FNLIT*: At the highest level, critical food/nutrition literacy involves a deeper understanding of the broader social, economic, and environmental factors that influence food choices and health outcomes. Individuals with critical food/nutrition literacy skills can analyze and critique food-related policies, marketing strategies, cultural norms, and socioeconomic disparities that impact access to healthy foods and contribute to nutrition-related health inequalities. They are empowered to advocate for systemic changes that promote food security, food justice, and equitable access to nutritious foods for all members of society (40).

The three dimensions of FNLIT complement each other, as proficiency in one component often leads to the development and enhancement of skills in the others. These components work synergistically to build a comprehensive understanding of food, nutrition, and their impact on health and sustainability.

FNLIT, Its Determinants, and Outcomes in the Food System

FNLIT is one of the most important factors shaping individuals' dietary patterns and lifestyles, as well as the broader food system (Doustmohammadian et al. 2020; Doustmohammadian et al. 2022a; Ashoori et al. 2023). The set of factors that shape this context is derived from the culture and traditions of each society, which itself is affected by the geographic, cultural, social, economic, and nutritional knowledge of individuals in the community. Lack of consciousness about healthy food choices can lead to adopting unhealthy eating habits, affecting individuals' health and nutrition status adversely. In recent decades, the complexity of global and

local food production, supply, and consumption has drawn attention to the concept of a food system in FNLIT components (Vettori et al. 2019).

In the conceptual model of food and nutrition literacy, derived from Hernandez's study (Hernandez et al. 2021) and the Food Literacy Wheel (Rosas et al. 2021), the understanding of the interaction between health literacy and food/nutrition literacy has been emphasized for advancing education, interventions, policies, and program development. This model integrates different themes, attributes, and concepts of nutrition literacy, food literacy, and health literacy to show the interconnected features of these constructs and to develop a common understanding of these concepts (Fig. 2). At the core of the model, the concepts related to individual determinants such as knowledge and understanding (understand), abilities, motivation, values and beliefs, access to information, and the ability to interpret and evaluate information interact with community factors including policies, programs, resource availability, and culture. This contributes to a comprehensive understanding of food systems within culture and society. All these capacities are inspired by functional, interactive, and critical dimensions of health (food/nutrition) literacy classification from Nutbeam's (2008) and Slater's (2014), as well as three knowledge domains proposed by Habermas (Wong): (1) empirical knowledge reflecting knowledge skills acquired through individualistic approaches to food; (2) historical/hermeneutics knowledge encompassing an understanding of culture, history, and meanings related to food experience; and (3) critical knowledge reflecting a critical reflection that exposes hidden power structures within food systems for social transformation. Recognizing the challenges linked to social and health inequalities, there is a need to identify socio-demographic factors (e.g., demographics, race, socioeconomic status, occupation, employment, income, education, and literacy) and environmental determinants (culture, political, economic, and physical), as well as situational influences (social support, family, peers, media) (Doustmohammadian et al. 2019; Garcia-Codina et al. 2019; Rosas et al. 2019; Ashoori et al. 2021; Dolezel and Hewitt 2023). FNLIT plays a determining role in how individuals cope with complex multivariate factors (individual, social, and environmental factors) that influence dietary choices and impact health, food security, and environmental sustainability (Johnston et al. 2014; Hernandez et al. 2021; Rosas et al. 2021).

FNLIT in Interaction with Food Security

There is a two-way relationship between the dimensions and components of FNLIT and food insecurity. Components of FNLIT that address economic considerations in the area of food and nutrition include the skill of managing financial resources for food preparation, the skill of accessing basic foods that can be prepared with limited financial resources, and the skill of choosing the most suitable food basket (providing the needs, being healthy, and according to the taste of family members) with the available budget that is related to the reduction of food insecurity (Johnston et al. 2014). People who have more skills in managing economic affairs in the field of food and nutrition are more likely to be able to manage unfavorable economic conditions

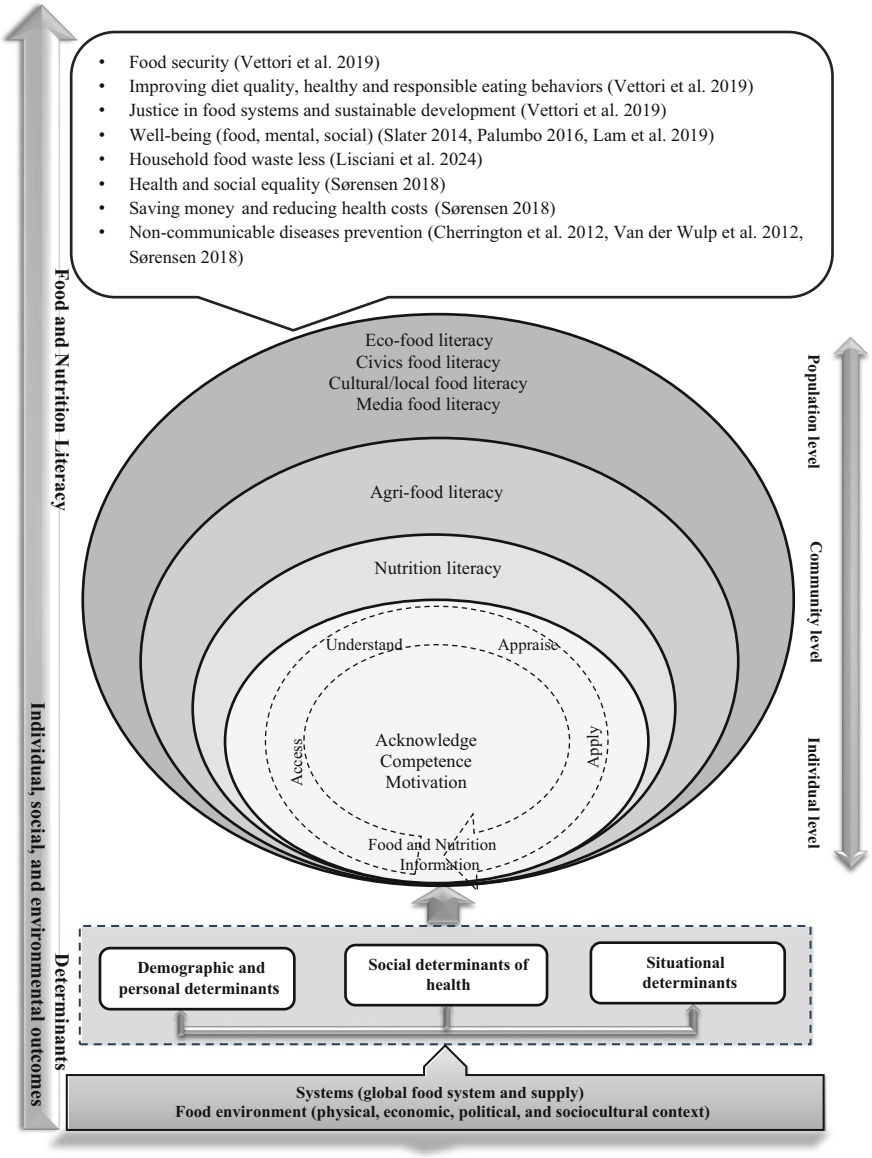

Fig. 2 Food and nutrition conceptual model and its determinants and outcomes (Hernandez et al. 2021, Rosas et al. 2021)

in a way that does not lead to food insecurity. Therefore, in the design of interventions to reduce the food insecurity of vulnerable groups, strengthening these skills can be considered an effective approach independent of the economic conditions of the household. On the other hand, food insecurity may limit the ability to use FNLIT

skills to achieve adequate quality of diet. According to studies, the probability of food literacy and low nutritional status is higher in people from insecure households (Khorramrouz et al. 2020). This issue necessitates the implementation of food literacy and food security interventions at the same time, especially in deprived and low-income areas.

FNLIT and Sustainability

According to the evidence, the components emphasized in FNLIT are effective in building capacity and empowering people to maintain and sustain the environment, food and agriculture system, and sustainable nutrition (Lisciani et al. 2024).

According to the definition of FAO, sustainable diets are culturally acceptable, accessible, economically fair, affordable, nutritionally sufficient, safe, and healthy while respecting biodiversity and ecosystems. The main components of this diet include (1) nutritional needs, food security, and access to food; (2) biodiversity, environment, and climate; (3) equality and fair trade; (4) ecofriendly, local, and seasonal foods; (5) skill and cultural heritage; and (6) wellness and health (Johnston et al. 2014).

Food production and consumption is one of the important aspects of climate change, and its improvement is considered one of the most important pillars of sustainable development to preserve the biosphere (Naskali et al. 2022). There is a consensus that the global food and nutrition systems are not socially, politically, and environmentally sustainable (Johnston et al. 2014). At the same time, many development problems in communities, from public health to poverty and lack of energy, water, and transportation, are related to the food and nutrition system. From the point of view of citizenship and individual capabilities, the expansion and realization of sustainable food systems require related knowledge and cognitive skills, and therefore it is one of the key concepts that should be considered in the framework of FNLIT.

Responsible consumption occurs when people become aware of the impact of their decisions on the environment, personal health, and society. Perhaps this is the reason why development actions are often performed with insufficient knowledge of negative environmental effects and without action or with insufficient actions to prevent or handle them. The educational system is considered one of the most important social institutions for creating suitable platforms for the commitment and implementation of the concept of sustainable development and dealing with environmental risks. However, the promotion of sustainability guidelines in the food system is not only related to the supply of food, but, besides the importance of educating future generations, knowledge and interest in food are also considered. This issue is closely related to the citizenship view of food literacy, which, according to Wilkins' definition, is "the participation of citizens in food-related behaviors that support, rather than threaten, the development of a democracy, social and economic food system with environmental sustainability" (Wilkins 2005).

Bublitz et al. (2011) identified food and nutrition literacy as a key requirement for achieving "nutritional health," which is ultimately seen as a positive relationship with food at individual and societal levels, leading to empowerment, motivation, and

the opportunity for sustainable development (Bublitz et al. 2011). Likewise, Block et al. (2011) argued that low food and nutrition literacy affects health outcomes and imposes substantial individual and social costs (Block et al. 2011). From this point of view, FNLIT encompasses not only the capacity to make informed decisions in selecting and preparing food but also being cognizant of the environmental, social, economic, cultural, and political consequences of individual dietary decisions, with a focus on enhancing environmental sustainability as well as personal and social health. Consequently, food and nutrition literacy emerges as a pivotal criterion for assessing the efficacy of public health nutrition policies, exerting a profound impact on the sustainability of nutritional strategies and the advancement of community health. The growing complexity of food systems at the local and global level in recent decades emphasizes the concept of interactions between food systems (from farm to production, transportation, processing, marketing, food waste, climate change, processed foods, and transition nutrition) and the components of food and nutrition literacy.

Sustainable Diet Components in the Existing Measurement Models of FNLIT

Recent evidence shows that the measurement models of FNLIT often lack precision and focus mainly on cognitive aspects, neglecting interaction and critical elements (Tables 1 and 2). Key components addressed include nutrition knowledge, cooking skills, and food choices in natural contexts. However, aspects such as food systems, food security, sustainable diets, and environmental sustainability are rarely covered (Stjernqvist et al. 2021). Few studies have developed multifaceted instruments based on a comprehensive dimensional food literacy (FL) concept (Stjernqvist et al. 2021; Teng and Chih 2022). These tools included the competencies of sustainable knowing and doing, as well as the rarely investigated competencies of using the senses, caring for others, and the desire to participate as a citizen in food-related issues. This multifaceted approach to food literacy broadened the understanding beyond mere knowledge and skills, integrating sensory, social, and civic dimensions to foster a more holistic engagement with food issues.

Food and nutrition literacy is an important concept that allows researchers, specialists, planners, and educators to create new educational methods and thinking to achieve sustainable development goals. This approach can be the basis for developing prevention policies and programs, improving the health of communities, prosperity, and preservation of the environment and cultures. Despite these considerations, Kimura (2011) has challenged the concept of food literacy and believes that many current models only consider individual knowledge and skills as the only factors influencing food choices, nutritional behaviors, and food preparation methods (Kimura 2011). Vaitkeviciute et al. (2015) also have a similar argument and believe that despite the broad definition of food literacy, studies do not examine all aspects of this concept (Vaitkeviciute et al. 2015). For this reason, interventions targeted at FNLIT promotion did not have the desired effectiveness (Brooks and

Table 1 Key components of sustainable diets in the measurement models of FNLIT in children and adolescents

Author, year, country	Doustmohammadian et al. (2022b), Iran	Liu et al. (2021), China	(Khorramrouz et al. 2022) Iran	Stjernqvist et al. (2021), Denmark	Ashoori et al. (2020), Iran	Deesamer et al. (2020), Thailand	Tabacchi et al. (2020), Italy	Amin et al. (2019), USA
Key components of sustainable diets								
Food and nutrient needs, food security, and accessibility	×	×	×	×	×	×	×	×
Biodiversity, environment, and climate	×	×	×	×	×	×	×	
Equity and fair trade				×				
Ecofriendly, local, and seasonal foods				×	×			
Cultural heritage and skills	×	×	×	×	×		×	
Well-being and health	×	×	×	×	×	×	×	×

Author, year, country	Naigaga et al. (2018), Norway	Williams et al. (2017), USA	Ronto et al. (2016), Australia	Guttersrud and Petterson (2015), Norway	Sadegholvad et al. (2014), Australia	Slater (2013, 2014), Canada	Reynolds et al. (2012), USA	Ndahura (2012), Uganda
Key components of sustainable diets								
Food and nutrient needs, food security, and accessibility	×	×	×	×	×	×	×	×
Biodiversity, environment, and climate			×		×			
Equity and fair trade								
Ecofriendly, local, and seasonal foods			×		×			
Cultural heritage and skills					×	×	×	
Well-being and health	×	×	×	×	×	×	×	×

Table 2 Key components of sustainable diets in the measurement models of FNLIT in adults

Author, year, country	Fisher and Potgieter (2024), Africa	Vrinten et al. (2023), Netherlands	Teng and Chih (2022), Taiwan	Rosas et al. (2022), Portugal	Park et al. (2020), Korea	Truman and Elliott (2019), Canada	Bublitz et al. (2019), USA	Thomas et al. (2019), USA	Slater et al. (2018), Canada	(Krause et al. 2016), Switzerland
Key components of sustainable diets										
Food and nutrient needs, food security, and accessibility	×	×	×	×	×	×	×	×	×	×
Biodiversity, environment, and climate	×	×	×	×	×	×		×	×	×
Equity and fair trade			×							
Ecofriendly, local, and seasonal foods			×	×	×			×		×
Cultural heritage and skills	×	×	×	×	×	×				×
Well-being and health	×	×	×	×	×	×	×	×	×	×

Author, year, country	Perry et al. (2017), Canada	Trubek et al. (2017) USA	Cullen et al. (2015), Canada	Vidgen and Gallegos (2014), Australia	Desjardins (2013), Canada	Topley (2013), Australia	Howard and Brichta (2013), Canada	Vrhovnik (2012), Canada	Schnoegl et al. (2006), Germany
Key components of sustainable diets									
Food and nutrient needs, food security, and accessibility	×	×	×	×	×	×	×	×	×
Biodiversity, environment, and climate	×		×	×	×	×	×		×
Equity and fair trade									
Ecofriendly, local, and seasonal foods	×								
Cultural heritage and skills	×	×	×	×	×	×	×		×
Well-being and health	×	×	×	×	×	×	×	×	×

Begley 2014). The evidence shows a dual interpretation of the concept of food and nutrition literacy by experts. Despite the growing agreement on a comprehensive definition of food and nutrition literacy, many experts in this field define it in terms of functional abilities and nutritional skills, and the important aspects of sustainable nutrition are ignored in the interactive and analytical skills of food and nutrition literacy. On the other hand, in the system approach that aligns with the comprehensive definition of food and nutrition literacy, the discourse remains at the theoretical level and with functional defects. It should be noted that food literacy is usually associated with the concept of sustainability, but this connection is less considered both at the professional level and in scientific literature.

Public Health Implications

FNLIT encompasses the understanding of how food impacts health and well-being. This includes knowledge of the nutritional value of different foods, the influence of food choices on health, and competence in accessing, preparing, and cooking nutritious meals. Unfortunately, food and nutrition illiteracy has become a pervasive issue with detrimental effects on public health (Silva et al. 2023). Furthermore, this lack of literacy creates disparities in access to healthy foods and nutrition information among certain groups, including marginalized communities and low-income populations. Consequently, this can contribute to health disparities and further exacerbate the existing health inequities. To address these challenges, it is crucial to establish pathways that link food literacy with better health outcomes. These pathways should consist of education and training programs that equip individuals with the knowledge, skills, and resources necessary for informed decision-making regarding their diet as well as accessing and preparing nutritious meals. Additionally, these programs need to be culturally appropriate and accessible for all individuals at risk of nutrition and food illiteracy. Dissemination of inaccurate or false information about nutrition through digital platforms poses another obstacle to effective health communication efforts toward promoting healthy eating habits. In this digital age where misinformation can spread rapidly through social media channels or other online platforms, healthcare professionals, educators, and policymakers must collaborate to address this challenge by providing accurate information about food and nutrition (Silva et al. 2023).

Strategies, Policies, and Programs for Improvement

Promoting healthy eating behaviors drives growing efforts around the globe; within this condition, FNLIT emerges as a promising strategy. Integration of nutritional aspects alongside environmental, economic, and ethical sustainability is increasingly imperative in all educational and informational endeavors. Hence, customizing interventions, communication, and directives to enhance FNLIT could be a

sustainable approach, rather than providing general measures for everyone (Lisciani et al. 2024).

Several strategies are suggested to promote FNLIT and sustainability concepts at the individual/household, community, and policy/system levels (Brooks and Begley 2014; Begley et al. 2018; Wickham and Carbone 2018; Lisciani et al. 2024) (Fig. 3).

System levels are crucial since they ensure a widespread impact through various entry points within society, encouraging better understanding/practices around FNLIT at multiple levels simultaneously. Collaboration between public health officials, educators, community organizations, healthcare providers, and policymakers is essential in designing comprehensive strategies that address FNLIT from multiple angles.

In conclusion, food and nutrition literacy is an essential component for maintaining health and well-being, and it is vital to address the global issue of nutrition and food illiteracy to promote public health. By equipping individuals with the essential knowledge, skills, and resources to make informed food choices and to prepare nutritious meals, it is possible to improve health outcomes and reduce health disparities. The prospects of food and nutrition literacy look promising, with

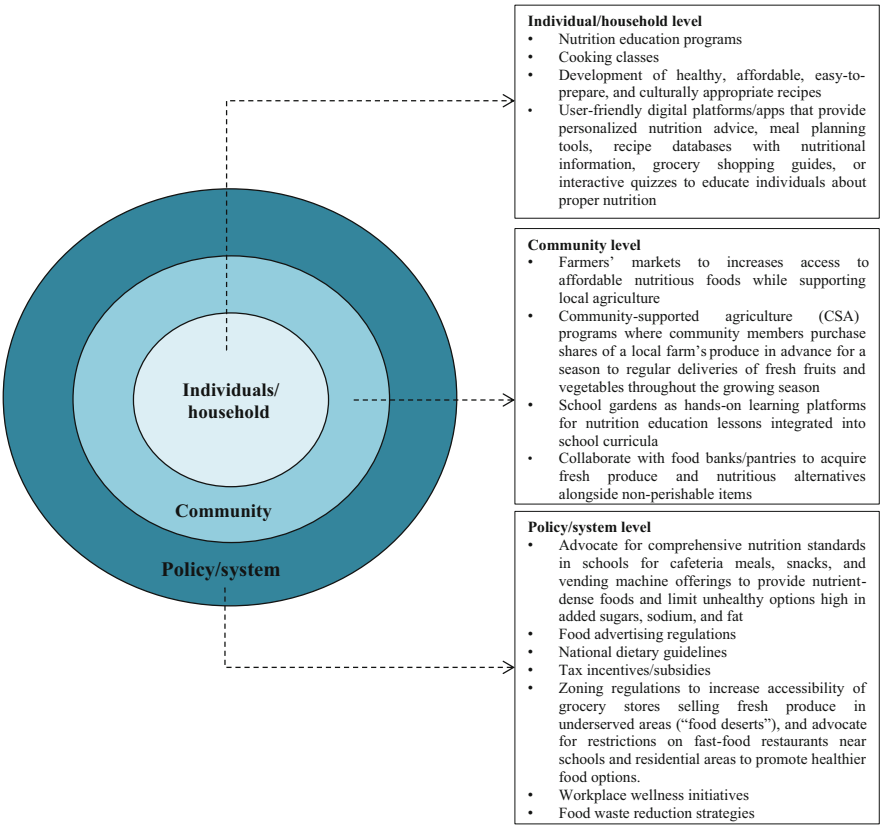

Fig. 3 Strategies, policies, and programs to improve FNLIT

technological progressions offering avenues for research, education, and policy development. Accessible and personalized food and nutrition guidance can be delivered through mobile applications and online resources. The establishment of comprehensive food literacy programs that empower individuals from diverse backgrounds to make informed dietary decisions can be facilitated through collaboration among healthcare practitioners, educators, and community leaders. Moreover, it is imperative to advocate for policies that ensure equitable access to healthy food and accurate nutritional information, especially for marginalized or underserved populations. By occupying these opportunities and nurturing collaborations, we can collectively strive toward a future in which food and nutrition literacy serve as potent tools in improving public health, mitigating inequalities, and promoting a culture of well-informed healthy lifestyles (Silva et al. 2023).

Mini-dictionary of Terms

- **Nutrition literacy (NL)** is one of the most important components of health literacy, and all definitions related to it focus on individuals' cognitive abilities, basic literacy skills, and numerical skills required for understanding and using nutrition-related information.
- **Food literacy (FL)** encompasses the ability to receive, process, and understand basic information about food and nutrition and includes the application of this information.
- **Food and nutrition literacy (FNLIT)** refers to a set of knowledge, skills, and abilities related to planning, managing, selecting, preparing, and consuming food to achieve a balanced and sustainable diet.
- **Sustainable diets** are culturally acceptable, accessible, economically fair, affordable, nutritionally sufficient, safe, and healthy while respecting biodiversity and ecosystems.
- **Food citizenship.** The participation of citizens in food-related behaviors that support, rather than threaten, the development of a democratic, social, and economic food system with environmental sustainability.

Summary Points

- The four domains of health literacy—basic literacy, scientific literacy, civic literacy, and cultural-ecological literacy—are integral to the development of food and nutrition literacy (FNLIT).
- FNLIT plays a determining role in how individuals cope with complex multivariate factors (individual, social, and environmental factors) that influence dietary choices and impact health, food security, environmental sustainability, and well-being.
- Although FNLIT is usually associated with the concept of sustainability, this connection is less considered both at the professional level and in scientific literature.

- Strategies should aim to enhance FNLIT through targeted educational programs, policy initiatives, and community-based interventions. Such efforts can empower individuals to make healthier food choices, ultimately contributing to the reduction of health disparities and the promotion of equitable health across diverse populations.
- Collaboration between public health officials, educators, community organizations, healthcare providers, and policymakers is essential in designing comprehensive strategies that address FNLIT from multiple angles.

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