Preliminary Analysis: Is there enough definitional clarity of food literacy for food security?

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Abstract

We conducted a systematic review of literature (2001 - 2021) to investigate definitional clarity of food literacy for food security among adults. Our findings suggest the need for a more precise definition of food literacy.
Keywords: Food literacy, foods security, adults, sustainable development goals.

Global food security is a serious issue because food production will have to increase by 70 % to feed a growing population of 9.5 billion by 2050. This scenario needs concerted and collaborative efforts from all fields of research. In the field of education, *food literacy* is an emerging concept that significantly impacts food security by imparting necessary knowledge, skills, and outlook on food-related issues. The idea of *food literacy* is relatively new, and food security is one of its key objectives, which has not been addressed significantly in literature. Most research works in food literacy are focused on culinary skills, health, and nutrition objectives in mind. Therefore, there is a significant gap in knowledge around the question of how food literacy can benefit achieving food security goals, which is also one of the prime goals of sustainable development goals, 2030. The notion of food literacy is generalized and can be applied to a variety of goals, including food security. However, food security itself, being a complicated concept, may require a more specialized form of the food literacy curriculum. Therefore, it is worth investigating how scholars have interpreted food literacy to understand the positioning of food security as an outcome of it.

Methodology

Search strategy

The current review is conducted following the systematic review methodology (Snyder, 2019). First, a general search was carried out to identify keywords for subsequent searches. Once the keywords were identified, more specific searches were carried out. Different databases were used, including ERIC, Google Scholar, AGRICOLA, Agriculture and Environmental Science, AGRIS, and Education full text. We used a PRISMA framework to strengthen our systematic review methodology. Inclusion and exclusion criteria were applied, which include document type (research article, review paper, and dissertations), year of publication (2001 - 2021), the language of publication (English), and subject (education). The Kansas State University library facilities were used to find articles from the databases. A total of 240 full-text articles and documents were accessed, and finally, 53 food literacy definitions were examined.

The papers were carefully studied to understand and extract the authors' ideas on food literacy and investigate how different dimensions of these definitions address the extents of food security dimensions based on GFSI's food security framework (discussed in the next section). The present study uses the Global Food Security Index (GFSI) framework (Corteva Agriscience, *accessed in 2021*) to assess the food literacy definitions through the lens of food security. We investigated whether the current definitions of food literacy have enough clarity to address the challenges of food insecurity. To do that, we thoroughly explored the GFSI food security framework. We identified the different factors of each dimension into macro (national

and global level), meso (community level), and micro (individual and household level) level factors.

GFSI framework

The four dimensions of GFSI include (1) *food availability* which is the supply side of food security and includes both physical food availability, access, and utilization, (2) *food affordability* which is the price and monetary aspects of households that decide whether families are food secure or not, (3) *quality and safety* which is the nutritional and health aspect of food security that also includes cooking and other culinary aspects, and the (4) the *natural resources and resilience* which is mainly the environmental sustainability dimension of food security that ensures stability to the food system.

Results & Discussion

Our findings suggest a lack of definitional clarity in 'food literacy' specifically in the context for achieving food security goals. Over the first decade of food literacy research during 2001 – 2011, we noticed a scattered distribution of research efforts. During the first nine years, five research works were traced from the literature base, and most research works (n=8) were reported in the year 2011. The first research work in the literature base that attempted to define food literacy was Kolasa et al., 2001. However, the focus of the definition by Kolasa et al. was mainly on nutritional and health aspects. Likewise, out of the thirteen documents that discussed food literacy in the first decade, eight (62 %) definitions emphasized that the concept of food literacy encompasses an individuals' food-related knowledge, skills, and decision making about nutritional aspects, and health and overall well-being of an individual. Regarding food security dimensions, these definitions incline towards the quality and safety side of food, inclination more towards understanding the nutritional quality of the food we eat. Many nutrition scholars have also termed food literacy as nutritional literacy (e.g., Diamond, 2007), and several others have termed it health literacy (e.g., Geboers et al., 2014). There were three definitions, Kornelsen et al. (2010), Macdiarmid et al. (2011), and Thomas et al. (2011), that did not indicate what type of food security dimension can be addressed.

Out of 40 food literacy definitions extracted from 40 different studies in the second decade of literature, we did not find any study that defined food literacy with enough clarity in the context of achieving food security goals. The definition by Cullen et al., 2015, touched upon all four dimensions of food security, but very superficially. Additionally, it lacked clarity towards the food availability and affordability dimensions of achieving food security. All the other 39 definitions either did not have a food security focus or lacked clarity in explaining the dimensions of food security, calling for a need to have a more precise and contextualized food literacy definition for food security.

The most widely discussed food security dimension in both the decades is the *quality and safety* dimension (Figure 1). While elaborating on food quality and safety aspects, the focus was on how individuals or communities acquire nutrition and health information and use them (Probst, 2006; Kolasa et al., 2001; Block et al., 2011; Pendergast et al., 2011; Renwick & Powell, 2019; Bassel, 2021; Amin et al., 2018). Several other aspects were discoursed that include (1) the ability to read and understand *food labels* (Vyver et al., 2013; Fordyce-Voorham, 2016), (2) *culinary practices* for healthy diet preparation (Kimura, 2011), (3) healthy *food choice* and *dietary behavior* (Thomas & Irwin, 2013), (4) critical, interactive, and functional literacy of food focusing on cultural beliefs on nutrition, personal skill development, and credible communication of nutrition information respectively (Slater, 2013).

Several authors have defined food literacy covering no food security dimensions (No dimension; next most common category). These definitions convey ideas that are either not

within the ambit of food security or clearly explainable. However, some ideas like development of individual's food decision making capacity (Minehan, 2013; Chambers, 2012), cooking skills and basic food preparation knowledge (Chambers, 2012), food literacy as an adaptive learning process (Reis, 2013), and learning to use food information (Cullerton, 2012 as cited in Cullen et al., 2015, p.143) are worthwhile and can be incorporated in future to develop a more comprehensive food literacy framework for food security.

Next, the *food availability* dimension (Figure 1) was discussed by some of the authors, however, the focus was on the following three main aspects, first, acquiring nutritional literacy by way of understanding source of nutrition from food (Christa & Gale, 2009), second, source (Vaughan, 2011; Thomas & Irwin, 2013), food preparation, and understanding source of traditional and new foods (Vaughan, 2011), and third, exploring the social and environmental components of food in order to understand the source of food (Stintson, 2010). Later during the second decade, the authors were more interested in understanding source of food (Thomas & Irwin, 2013; Marshman, 2015; Vaitkeviciute, 2015; Ohberg, 2012), especially in the context of the source of the locally produced food which would not only add diversity to the diets but also enhance nutritional value of the diet. Beauge et al. (2014) on the other hand emphasized the importance of understanding crop production practices in order to be able to comprehend our daily food. The food availability dimension of food security is just not about discovering the source of different food, but also how sustainable that source is in terms of physical and economic food access (FAO, 2008).

The *food affordability* dimension (Figure 1) is discussed as the need to empower individuals with purchasing power for food (Thomson & Irwin, 2011; Thomas & Irwin, 2013), especially the affordability of healthy diets (Dumont, 2021; Desjardin & Hailburton, 2013 as cited in Cullen et al., 2015). At micro level (households or individual) besides food costs various other aspects of economics play crucial role in determining food's affordability including the household income, available disposable income that can be spent on food, and social support (Capone et al., 2014) which needs to be elucidated in food literacy definition.

Natural resource resilience dimension (Figure 1) appeared in the second decade definitions by a handful of authors. They proposed that food literacy is based on the understanding of different environmental factors associated with food system and environmental-friendly diet. For example, Skeaff & O'Sullivan (2015) defines food literacy as "the knowledge, skills and behaviors needed to achieve a healthy and environmentally friendly diet" (p. 1, from abstract). Other authors like Cullen, 2015; Renwick & Powell, 2019 have discussed the need of understanding the environment from the perspective of sustainable food systems.

Conclusion

The field of food literacy is relatively new, with databases indicating two decades of research. The first study that defined the term was Kolasa et al., 2001. Since then, some scattered publications have been made until 2010. The number of studies gradually increased from 2011, and research in this field has completed two decades in 2021. The current research is a systematic review of two decades of food literacy research to explore the definition of food literacy proposed or used by scholars from different fields and find out if they have the clarity to address food security challenges. Our review reveals that most studies emphasized nutritional and healthy diet as the primary focus of food literacy definitions. However, as per the current definitions and frameworks of food security, nutritious and healthy diets alone are not sufficient for ensuring a household's food security level. It is also about whether there is the availability of affordable and quality environmentally sustainable food. Moreover, several other interrelated and interdependent factors need to be considered within this context

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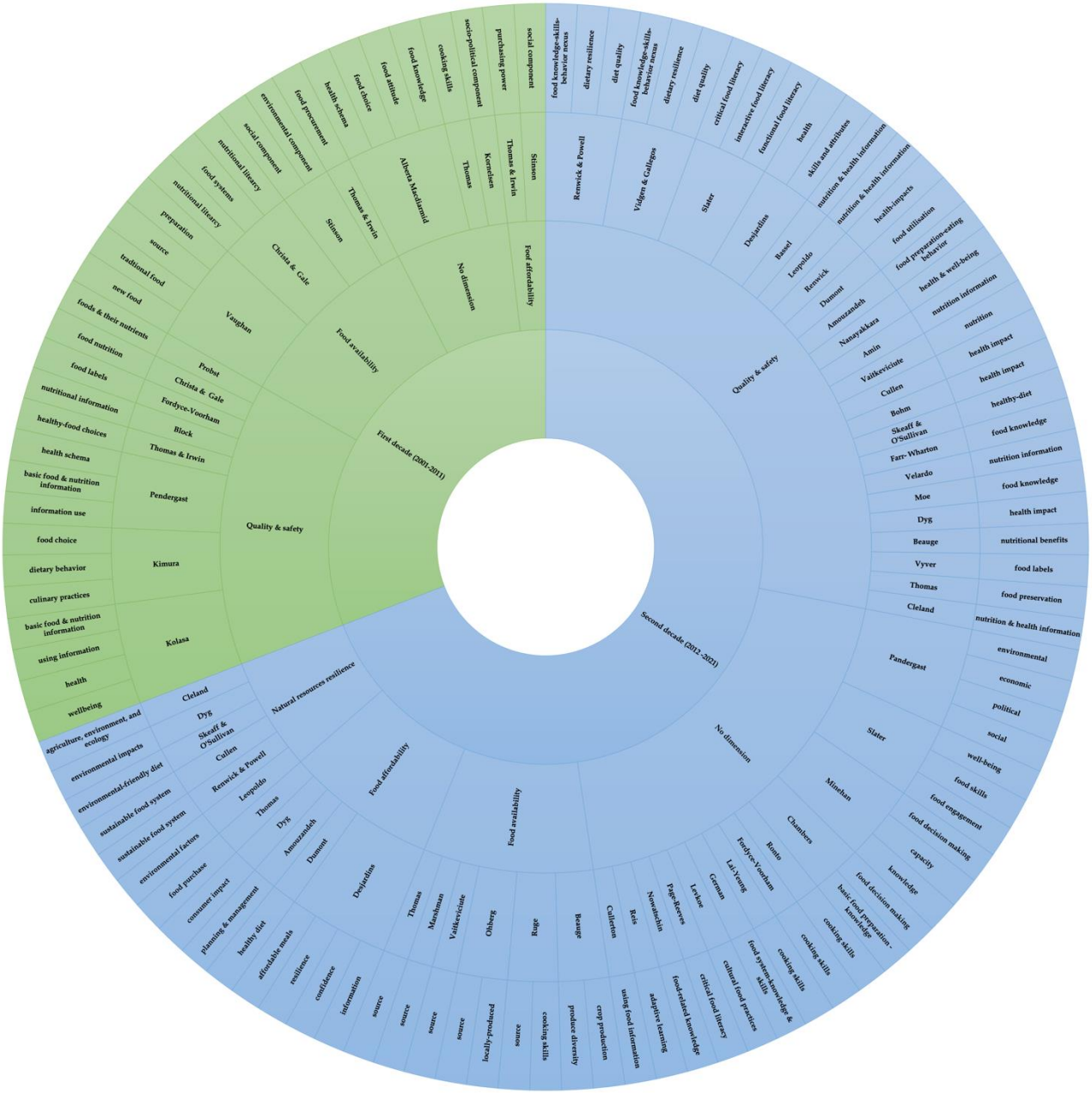
Figure 1

Sunburst chart showing first, and second decade definitions of food literacy and the different food security dimensions covered



Note.

1. The first & innermost circle shows decades (the first- decade indicated by green and second-decade blue area), the second circle consists of the food security dimensions proposed by GFSI, the third circle is the various contributing authors, and the fourth and the outermost circle contain different aspects covered by the authors within each food security dimension
2. In both the first- and second-decade definitions, the quality & safety dimension of food security is discussed widely, followed by authors who proposed definitions that did not address any food security dimension