



Concepts and critical perspectives for food environment research: A global framework with implications for action in low- and middle-income countries

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ABSTRACT

Malnutrition in all its forms currently affects one in three people globally and is considered one of the greatest public health challenges of our time. Low- and middle-income countries (LMICs) are increasingly facing a double burden of malnutrition that includes undernutrition, as well as increasing overweight, obesity and diet related non-communicable diseases. The role of food environments in shaping transitioning diets and the double burden of malnutrition in LMICs is increasingly gaining policy attention. However, food environment research to date has predominantly been undertaken in response to obesity and associated diet-related non-communicable diseases in high-income countries (HICs). Empirical research in LMICs is in its infancy. There is a need to create a cohesive research agenda to facilitate food environment research and inform action across the globe, particularly with regard to LMICs. In this paper, we address three fundamental questions: First, how can the food environment be defined and conceptualised in a way that captures the key dimensions that shape food acquisition and consumption globally? Second, how can existing knowledge and evidence from HICs be leveraged to accelerate food environment research in LMICs? Third, what are the main challenges and opportunities in doing so? We conduct a brief synthesis of the food environment literature in order to frame our critical perspectives, and introduce a new definition and conceptual framework that includes external and personal domains and dimensions within the wider food environment construct. We conclude with a discussion on the implications for future research in LMICs.

1. Introduction

Malnutrition in all its forms afflicts one in three people globally (High Level Panel of Experts on Food Security and Nutrition, 2017). It affects every country and is considered one of the greatest public health challenges of our time (Development Initiatives, 2017). High-income countries (HICs) are almost universally experiencing a very high burden of overweight, obesity and diet-related non-communicable diseases (NCDs) (Ng et al., 2014). In low- and middle-income countries (LMICs), populations are increasingly facing a double burden of malnutrition that includes undernutrition, as well as increasing overweight, obesity and diet-related NCDs (World Health Organisation, 2017). This double

burden of malnutrition often co-exists within communities, households and individuals (World Health Organization, 2017).

Globalization, economic development, technological advancement and shifts in agricultural systems have been rapidly transforming diets across the world in recent decades. Collectively, these factors have led to a transition away from the reliance on staple grains, legumes, vegetables and fruits to dietary patterns that include more processed foods, away-from-home foods, animal source foods, refined carbohydrates, edible oils and sugar-sweetened beverages (Popkin, 2015; Popkin et al., 2012). While these transitioning diets are being documented, there is limited research investigating how people interact with food sources to acquire foods as part of daily life. Accordingly, the role

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of food environments in shaping diets is increasingly gaining policy attention (Development Initiatives, 2017, High Level Panel of Experts on Food Security and Nutrition, 2017, Global Panel on Agriculture and Food Systems for Nutrition, 2017), set against the backdrop of the Sustainable Development Goal (SDG) 2 to end hunger, achieve food and nutrition security, improve nutrition, and promote sustainable agriculture (United Nations General Assembly, 2015). Such targets to ensure the year-round provision of safe, nutritious and sufficient food will require healthy food environments that cater for all (Food and Agriculture Organisation of the United Nations, 2016a). Improving knowledge and understanding about food environments, including the who, what, when, where, why and how of food acquisition and consumption, will be key to addressing malnutrition in all its forms.

The United Nations Decade of Action on Nutrition 2016–2025 (United Nations General Assembly, 2016) presents a key opportunity to improve food environments across the globe. Food environment research to date has primarily been undertaken in response to the rapid rise of obesity and associated diet-related NCDs in HICs. However, with critical refinement and adaptation of key concepts, methods and metrics, food environment research has the potential to provide an integrated approach to addressing malnutrition in all its forms in LMICs. A number of pioneering studies have broken new ground by investigating food environments in middle-income countries (Azeredo et al., 2016; Duran et al., 2016; Fernandes et al., 2017). Whilst a growing body of literature is starting to emerge, food environment research in LMICs remains in its infancy.

In this paper, we address several fundamental questions with the aim of creating a cohesive research agenda and facilitating robust empirical research to inform action, particularly in LMICs. First, how can the food environment be defined and conceptualised in a way that captures the key dimensions that shape food acquisition and consumption globally? Second, how can existing knowledge and evidence from HICs be leveraged to accelerate food environment research in LMICs? Third, what are the main challenges and opportunities in doing so?

Consideration of these questions is crucial in order to: 1) track rapidly evolving food environments across the globe, particularly in LMICs; 2) investigate relationships between components of the food environment and dietary, nutrition and health outcomes; and 3) identify appropriate policy entry points to facilitate healthier food environments that promote nutritious diets and improve public health outcomes. We present critical perspectives from the Agriculture, Nutrition and Health Academy Food Environment Working Group (ANH-FEWG) (Box 1), including a new food environment definition and conceptual framework applicable to global contexts. A brief synthesis of existing literature from HICs is provided to guide research in LMICs,

Box 1

The Agriculture, Nutrition and Health Academy Food Environment Working Group: A brief overview.

The Agriculture, Nutrition and Health Academy Food Environment Working Group (ANH-FEWG) was established in 2016 as a work stream of the Innovative Methods and Metrics for Agriculture and Nutrition Actions (IMMANA) initiative. The working group brought together experts to review and synthesise food environment definitions, key concepts, methods, metrics, and research gaps, with the aim of providing a platform of consensus to guide and accelerate food environment research in LMICs.

A literature search of review articles and grey literature on food environments was conducted by two ANH-FEWG members in February 2016. The inclusive search used four databases; Medline, Econlit, Web of Science, Scopus. The search terms were ‘food environments’, ‘methods’ and ‘metrics’. The resulting synthesis of review articles (n = 18) informed bi-monthly ANH-FEWG meetings, whereby working group members discussed and evaluated definitions, key concepts, frameworks, methods and metrics with critical consideration to their LMIC application. This formative phase led to the iterative development of a new working definition and conceptual framework (Fig. 2).

The emerging body of work was presented for consultation at the Agriculture, Nutrition and Health Academy Week 2016, in Addis Abba, Ethiopia. Discussions with over 100 participants at the conference and further analysis of grey literature refined concepts further. A non-peer reviewed technical brief by Turner et al. (2017) outlining evolving concepts was disseminated at the Agriculture, Nutrition and Health Academy Week 2017, in Kathmandu, Nepal. A short animation supporting this technical brief can be found at (<https://www.youtube.com/watch?v=5cUaro1gUcI>)

leading into a discussion of the implications for action in LMIC settings.

2. How can we define and conceptualize food environments?

While it is beyond the scope of this paper to provide a comprehensive review of the literature, we present a brief synthesis of existing food environment definitions and concepts in order to frame our contributions and critical perspectives.

Food environment research builds on socio-ecological theory and the understanding that health-related behaviours are determined by inter-related personal and environmental factors (Brug et al., 2008; Rao et al., 2007). Pioneering conceptual work by Glanz et al. (2007) described the food environment at the local *neighborhood scale*, termed the ‘community food environment’, and the *in-store scale*, referred to as the ‘consumer food environment’. This conceptualization has guided much of the empirical research seeking to quantify the world that is ‘out there’ in terms of the various types of food sources and products that people may acquire and consume. However, beyond the ‘community’ and ‘consumer’ based concepts and broad notions of “any opportunity to obtain food” (Townshend and Lake, 2009:910), defining precisely what a food environment is and the critical components it entails has proven somewhat more challenging.

Swinburn et al. (2013) defined the food environment as the “collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people’s food and beverage choices and nutritional status” (Swinburn et al., 2013:2). The identification of structural drivers of food acquisition, consumption, and nutritional status is particularly useful in framing the wider concept. However, at an operational level there is a need to define a set of measurable dimensions to guide empirical research. Herforth and Ahmed (2015) provided an important contribution in this regard by pinpointing a range of key dimensions, including the “availability, affordability, convenience, and desirability of various foods.” (Herforth and Ahmed, 2015:506). Key publications by the Global Panel on Agriculture and Food Systems for Nutrition, (2016) and the Food and Agriculture Organisation of the United Nations, (2016a) built on this work, adding further dimensions and introducing the role of people’s daily lives and activities; “Food environments comprise the foods available to people in their surroundings as they go about their everyday lives and the nutritional quality, safety, price, convenience, labelling and promotion of these foods” (Food and Agriculture Organisation of the United Nations, 2016a:vii; Global Panel on Agriculture and Food Systems for Nutrition, 2016:83).

The Food and Agriculture Organisation of the United Nations, (2016a) also provided a critical contribution by framing the food environments as the ‘interface’ or ‘link’ between food systems and diets

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