The Best Practices for Designing Built Environments to Promote Healthy Food Access and Dietary Behaviors in Low-Income and Underserved Communities

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ABSTRACT

***Background**: The built environment can influence health outcomes, including access to good dietary options. **Aims**: The current study intends to thoroughly evaluate the literature on best practices for building environments that promote healthy food access and nutritional behaviors in low-income and underserved communities in Indonesia. **Method**: To discover relevant studies on this topic, a thorough literature review was done using databases from PubMed, Web of Science, and Scopus extracting. **Result**: The final analysis included 32 studies after removing duplicates and applying inclusion and exclusion criteria. Extracting and assessing data from the chosen research and thematic synthesis was applied. The data was extracted and processed into a detailed narrative that provided an overview of the best practices. **Conclusion**: According to the findings of the literature study, built environment design can have a considerable impact on healthy food availability and eating patterns in Indonesian communities. It might be possible to develop effective interventions that enhance health outcomes for all Indonesians by addressing these gaps in the evidence.*

***Keywords**: built environment, dietary behaviors, food access, low-income communities*

INTRODUCTION

In low-income and underserved communities, pervasive food insecurity and poor diets pose significant public health challenges (Cooksey-Stowers *et al.*, 2020). The built environment plays a crucial role in shaping dietary habits and food access in these communities (Escaron, 2019; Rahmanian *et al.*, 2014). Limited stores and healthy food options contribute to suboptimal diets and heightened obesity rates, exacerbated by factors such as distance to grocery stores and transportation constraints (Atanasova *et al.*, 2022; Widener *et al.*, 2017).

Emphasizing healthy food access, research highlights that neighborhoods with more nutritious options exhibit lower obesity and chronic disease rates (Hallum *et al.*, 2020; Ziso, 2022). Moreover, the built environment significantly influences physical activity levels and overall health outcomes, with features like sidewalks, bike lanes, and parks fostering more active communities (Barradas *et al.*, 2022).

The impact extends beyond physical health, as the built environment can affect mental health, especially in areas characterized by high noise, air pollution, and crime rates (Elf *et al.*, 2020; Weber *et al.*, 2022). Recognizing the importance of healthy food access and dietary environments, this paper reviews the literature on building such environments for low-income and underserved communities, acknowledging the growing public health focus on this issue.

Beyond food, healthcare accessibility is a vital concern in these communities, with limited access contributing to health disparities (Zhang *et al.*, 2017; Winkfield *et al.*, 2021). Designing physical environments to encourage healthy eating is an emerging field, drawing increased public health attention. Existing research, however, has

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predominantly concentrated on individual-level interventions, such as nutrition education, rather than broader built environment initiatives (Green *et al*., 2013; Rodriguez Mireles, 2023).

Acknowledging the intricate relationship between built environments and public health, this paper delves into the role of design in creating healthy and sustainable spaces. The research underscores the impact of the built environment on diet and food access, particularly for marginalized populations in low-income communities (Evans *et al*., 2015). To address poor eating habits and food insecurity, extensive built environment initiatives are deemed essential, especially in areas facing challenges like food deserts, low mobility, and high food prices (Murrell *et al*., 2022).

Research findings highlight the nutritional challenges faced by low-income and marginalized communities, often residing in food deserts without access to grocery stores (Ziso *et al*., 2022). Studies reveal a correlation between living in food deserts and reduced consumption of fruits and vegetables, with an increased reliance on fast food and sugary drinks (Mousa & Freeland-Graves, 2022).

Promisingly, interventions such as new supermarkets and farmers' markets have shown positive effects on healthy food access and consumption patterns. For instance, the introduction of a new supermarket in a food desert led to increased fruit and vegetable consumption among residents (Cummins *et al*., 2017). Similarly, farmers' markets in low-income neighborhoods were associated with increased fruit and vegetable consumption and reduced sugary drink intake (Aretz *et al*., 2023).

Community gardens and urban agriculture emerge as grassroots solutions to improve food access and dietary habits in underserved communities. Research demonstrates that community gardens increase fruit and vegetable consumption among participants and enhance access to healthy food in the surrounding community (Alaimo *et al*., 2008). Additionally, urban agricultural programs have been linked to improved nutrition and increased fruit and vegetable consumption (Süß, 2018).

Recent built environment initiatives, like the 2010 Healthy Food Financing Initiative and guidelines from the Centers for Disease Control and Prevention (CDC), reflect a growing commitment to promoting healthy food access through infrastructure development. This paper aims to contribute to this evolving field by reviewing the literature and proposing strategies to enhance food availability and diets through the built environment in low-income and underserved communities.

METHODS

The current study examined the best practices for designing built environments that promote healthy food access and dietary behaviors in low-income and underserved communities. A comprehensive literature review was conducted to identify relevant studies on this topic. The following databases were searched such as PubMed, Web of Science, and Scopus. The search was conducted using the following keywords: "built environment", *"healthy food access"*, *"low-income communities"*, *"underserved communities"*, *"dietary behaviors"*, and *"food deserts"*.

Inclusion criteria for the studies were: (1) published in peer-reviewed journals, (2) conducted in low-income and underserved communities, (3) focused on the impact of built environment design on healthy food access and dietary behaviors, (4) published in the English language, and (5) conducted between 2010 and 2022.

Exclusion criteria for the studies were: (1) conducted outside of low-income and underserved communities, (2) not focused on the impact of built environment design on healthy food access and dietary behaviors, and (3) conducted before 2010.

The initial results of the search were 467 studies. After deleting duplicates and applying inclusion and exclusion criteria, the final analysis contained 32 studies (see Table 1). Thematic synthesis was used to extract and evaluate data from the selected research.

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Table 1. Breakdown of Initial Studies Based on Database Sources

Sources	Exclusion criteria				#of articles after excluded
	Initial search	Conducted outside Low income and underserved communities	Not focus on Built Environment	Conducted before 2010	
Pubmed	150	80	21	39	10
Scopus	180	113	45	15	7
WoS	137	70	36	16	15

The thematic synthesis involved the identification of key themes and concepts from the selected studies, followed by the development of descriptive and analytical themes. The extracted data were then synthesized into a comprehensive narrative that provided an overview of the best practices for designing built environments that promote healthy food access and dietary behaviors in low-income and underserved communities.

Limitations of the study include the reliance on published studies and the exclusion of non-English language studies, which may limit the generalizability of the findings. Additionally, the study was limited by the heterogeneity of the included studies, which made it challenging to conduct a meta-analysis.

RESULTS AND DISCUSSION

The findings from the literature review suggest that designing built environments to promote healthy food access and dietary behaviors can improve the health outcomes of low-income and underserved communities. Across North America, Europe, and Asia, several strategies have been identified that can increase access to healthy food options and promote healthier dietary behaviors.

In North America, community gardens and farmers' markets have been found to increase access to healthy food options in low-income areas (see Table 1). Strategies such as increasing the availability of healthy food options in corner stores and reducing the availability of unhealthy food options have also improved dietary behaviors in low-income areas. Developing food retail environments that are culturally appropriate and accessible can also improve access to healthy food options.

In Europe, designing aesthetically pleasing food environments that promote social interaction has positively impacted dietary behaviors in low-income areas. Increasing the density of healthy food outlets in low-income areas and reducing the cost of healthy food options have also improved access to healthy food options (table 2).

In Asia, developing culturally appropriate food environments that are responsive to the needs of local communities has been found to improve dietary behaviors in underserved areas. Access to healthy food options has been increased by increasing the availability of healthy food options in public housing complexes and street food markets (table 3).

Table 2. Key findings in the North American region

Study	Key Findings
Wang *et al.*, 2014	Access to healthy food options can be improved by developing community gardens and farmers' markets in low-income areas.
Krukowski *et al.*, 2012	Strategies such as increasing the availability of healthy food options in corner stores and reducing the availability of unhealthy food options can improve dietary behaviors in low-income areas.
Solis, 2022	Access to healthy food options can be improved through the development of food retail environments that are culturally appropriate and accessible.

Table 3. The critical findings in European region

Study	Key Findings
Raghoebar *et al.*, 2019	Designing food environments that are aesthetically pleasing and promote social interaction can positively impact dietary behaviors in

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	low-income areas.
Afshin *et al.*, 2017	Reducing the cost of healthy food options and increasing the availability of healthy food options can improve dietary behaviors in low-income areas.
Ohri-Vachaspati *et al.*, 2019	Increasing the density of healthy food outlets in low-income areas can improve access to healthy food options.

Table 4. The critical findings in Asia region

Study	Key Findings
Karanja *et al.*, 2022	Developing food environments that are culturally appropriate and responsive to the needs of local communities can improve dietary behaviors in underserved areas in low and middle-income countries.
Siu *et al.*, 2019	Increasing the availability of healthy food options in public housing estates can improve dietary behaviors in low-income areas in Hong Kong.
Aloia *et al.*, 2013	Providing subsidies for healthy food options and promoting the availability of healthy food options in street food markets can improve dietary behaviors in low-income areas in India.

The findings from the literature review have important implications for future research and practice in Indonesia. While there is limited research on the impact of built environment design on healthy food access and dietary behaviors in Indonesia, the findings from studies conducted in other regions suggest that several strategies may be effective in improving access to healthy food options and promoting healthier dietary behaviors in low-income and underserved communities.

One potential strategy is to increase the availability of healthy food options in traditional markets (pasar) in low-income areas. According to a study by Huriah (2018), traditional markets in Indonesia are essential sources of food for low-income households but often need more healthy food options. Promoting the availability of healthy food options in traditional markets may improve access to healthy food options in low-income areas.

Another potential strategy is to develop community gardens in urban areas, which has been found to increase access to healthy food options in North American communities (Gittelsohn *et al.*, 2013). Community gardening is already popular in rural Indonesia but less common in metropolitan settings. It can expand access to nutritious food options and encourage healthier eating patterns by encouraging the creation of community gardens in urban settings.

It may be necessary to create retail food environments that are culturally relevant and sensitive to the needs of local people since this has been shown to improve dietary behaviors in underprivileged areas (Karanja *et al.*, 2022). Traditional markets and street food vendors are significant food sources for many low-income households in Indonesia. It may be possible to alter dietary behaviors in low-income regions by collaborating with traditional market sellers and street food vendors to increase the availability of healthier food options.

Traditional markets (pasar) are an essential food source for low-income people and are a unique component of Indonesia's built environment. However, Huriah mn (2018) point out that these markets frequently lack healthy food options, mainly fresh fruits and vegetables, essential for a healthy diet. Increasing the availability of healthy food alternatives in traditional markets through focused interventions like boosting the sale of fresh produce or incentivizing sellers to offer healthier options could be an effective technique for improving access to healthy food in low-income regions.

Community gardening in North America serves as a valuable resource for low-income households by offering access to fresh vegetables. Additionally, it fosters physical activity and encourages community involvement. Community gardening is prevalent in rural areas of Indonesia, but less so in metropolitan areas. Nevertheless, by implementing adequate infrastructure and garnering community support, community gardening can serve as a feasible solution to enhance the availability of nutritious food in urban regions. This can be achieved by introducing initiatives to establish new

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grocery stores or farmers' markets in underserved areas that lack access to fresh and healthy food, thereby addressing the issue of food deserts. This may entail partnering with nearby enterprises or providing incentives to attract supermarkets to establish themselves in these communities, promoting sustainable practices through organic gardening methods that enable inhabitants to cultivate their own fresh vegetables. These gardens serve the dual purpose of offering access to nutritious foods and advocating for sustainable methods by reducing reliance on artificial pesticides and fertilizers. Additionally, they foster community cohesion by hosting frequent events like farmers' markets, cooking classes, and communal meals, which encourage residents to come together. These activities cultivate a feeling of togetherness among community members and generate chances for mutual experiences, exchange of knowledge, and social assistance. They also encourage physical activities by arranging recurring community events, such as farmers' markets, cooking lessons, or communal dinners, intending to unite people. These activities promote a feeling of togetherness and generate chances for people to share experiences, exchange knowledge, and receive social support.

In Indonesia's poor and marginalized neighborhoods, culturally appropriate food retail may encourage healthy eating. According to Karanja *et al*. (2022), traditional markets and street food vendors are vital to Taiwan's low-income populations' food environments. Dietary habits may improve in low-income Indonesian areas. Using traditional Indonesian dishes instead of fast food may also be a culturally relevant strategy to promote healthy eating. The best practices for constructing physical settings that enhance healthy food access and dietary behaviors include expanding access to healthy food options, supporting food equity, improving walkability, building community gardens, and improving transit options. For example, promoting food equity requires addressing structural gaps in the food system by eliminating barriers to healthy food access in low-income and underserved areas.

Finally, interventions focusing on built environment design may be ineffective if not accompanied by education and awareness-raising efforts such as nutrition workshops and cooking classes, organizing community health fairs, and social media campaigns to ensure that individuals understand the importance of healthy dietary behaviors. This is essential considering the prominence of traditional foods and cultural activities in Indonesia, which may contribute to less healthful dietary habits. As a result, interventions should be multifaceted, addressing both the built environment and individual-level issues.

Overall, while there is limited research on the impact of built environment design on healthy food access and dietary behaviors in Indonesia, the findings from studies conducted in other regions suggest that several strategies may be effective in improving access to healthy food options and promoting healthier dietary behaviors in low-income and underserved communities. Further research is needed to identify additional strategies that are effective in the Indonesian context and to identify barriers and facilitators to implementing these strategies in practice.

Best Practices

Based on the literature review, there are best practices for making the built environment contribute to human nutrition:

1. Increase access to healthy food options: Improve the availability and accessibility of healthy food options in low-income and underserved areas through interventions such as farmer's markets, community gardens, and urban agriculture. (Gittelsohn et al., 2013; Wang et al., 2014)
2. Enhance the walkability of urban areas: Develop infrastructure to promote walking and cycling in urban areas, including safe sidewalks and bike lanes, to increase physical activity and access to healthy food options. (Erlangga *et al*., 2021; Muzayanah *et al*., 2022)
3. Improve retail food environments: Work with traditional market vendors to promote the availability of healthy food options and improve the visual appeal of the market environment to encourage healthier food choices. (Carducci *et al*., 2020; Huriah, 2018).

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4. Encourage the community participation: Involve local communities in designing and implementing interventions to ensure that they are tailored to the unique needs and challenges of the community. (Aprile *et al.*, 2016; Muzayanah *et al.*, 2022)
5. Engage government and policymakers: Advocate for policies that promote healthy food access and support the development of infrastructure and programs that contribute to a healthy built environment. (Gittelsohn *et al.*, 2013; Wang *et al.*, 2014)

These best practices represent a starting point for designing interventions to improve healthy food access and dietary behaviors in low-income and underserved communities in Indonesia. However, it is essential to note that the effectiveness of these interventions may depend on factors such as cultural context, community engagement, and government support.

CONCLUSION

In conclusion, the existing literature indicates that built environment design can significantly impact healthy food access and dietary behaviors in low-income and underserved communities. In Indonesia, improving healthy food access and dietary behaviors requires addressing the unique challenges and opportunities of the built environment. However, further research is needed to identify effective strategies for improving health outcomes and assess interventions' feasibility and long-term impact. By addressing these gaps in the literature, it may be possible to develop effective interventions that improve health outcomes for all Indonesians.

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