

# BMJ Open Adult food choices in association with the local retail food environment and food access in resource-poor communities: a scoping review protocol

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## ABSTRACT

**Introduction** The local retail food environment influences dietary patterns and food choices, as suggested in the literature. The lack of access to healthy food within this environment may result in unhealthy food choices which may lead to obesity and the development of non-communicable diseases. Evidence suggests that resource-poor communities may have unhealthy food environments, therefore, preventing residents from making healthy food choices. A systematic scoping review will be conducted to provide an overview of the evidence on adult food choices in association with the local retail food environment and food access in resource-poor communities.

**Methods and analysis** This protocol for the scoping review was developed following the Preferred Reporting Items for Systematic reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) guidelines and the framework process by Arksey and O'Malley. Observational studies, published from July 2005 to January 2021, will be searched and screened. Keywords and medical subject headings (MeSH) terms will be used to search several multidisciplinary databases. Two independent reviewers will screen identified articles using the selection criteria and extract data using the PRISMA-ScR checklist. Descriptive numerical and thematic analysis will be performed to evaluate and categorise quantitative and qualitative data.

**Ethics and dissemination** Ethical approval will not be required for the review, as data from published studies will be used. The results of this scoping review will form part of a PhD thesis that will be submitted to the University of the Western Cape, South Africa. The review findings will also be presented at conferences and published in a peer-reviewed journal.

**Open science framework registration number** <https://osf.io/shf93>.

## INTRODUCTION

Malnutrition in the form of overweight, obesity and underweight is the leading cause of disease globally.<sup>1</sup> Dietary-related disease risk is determined by food choices and dietary consumption.<sup>2</sup> Food choices are defined as foods selected and consumed based on an individual's decision which is influenced by

## Strengths and limitations of this study

- The findings will provide insight on how the retail food environment plays a role in determining healthy food access and identify the barriers, enablers and mediators of food access which affect food choices of adults in resource-poor communities.
- Several multidisciplinary databases will be used in the search, as the food environment topic is extensive.
- In this systematic approach, findings from a body of knowledge that is heterogeneous in terms of methods and discipline will be summarised.
- Only studies published in English will be included.
- There will be no formal appraisal done which means possibility of inclusion of methodologically inferior studies. However, to reduce number of poor-quality studies included, only peer-reviewed and published studies will be included.

a combination of individual, environmental and economic factors.<sup>3</sup> Food choices are also a result of the relationship between individual factors and the food environment.<sup>4</sup> Glanz *et al* distinguish two types of environments that influence access to healthy food to make healthy food choices. These environments are namely the community nutrition environment (types and location of food stores and accessibility in each community), and the consumer nutrition environment (the availability of healthy and unhealthy food choices within any establishment where food is sold or served, ie, restaurant, school or work cafeteria, price, promotion and placement of food choices).<sup>5</sup> The food environment is also referred to as the local food environment. The retail food environment combines the physical proximity to food store locations, the distribution of food stores and markets at a community level, and consumer access to healthy affordable foods at food stores or markets.<sup>6</sup> The community and the consumer

nutrition environment, the interest topics of this study, will be referred to as the local retail food environment.

The local retail food environment is an important determinant of food choices and may influence individual, family and population-level health.<sup>7</sup> Furthermore, it may influence dietary patterns and food choices.<sup>7,8</sup> The lack of access to healthy food within this environment may result in unhealthy food choices, which may lead to obesity and the development of non-communicable diseases (NCDs) such as cancers, cardiovascular diseases and type 2 diabetes mellitus.<sup>8–10</sup> The local retail food environment is also a determining factor for food access.<sup>7</sup>

Food access relates to the physical and economic access to food.<sup>11</sup> Access to food means that it must be physically procured by individuals and be economically accessible. Thus, people can afford to buy the food that is available in the local retail food environment, and in adequate amounts.<sup>11</sup> Access to food consists of several components. Examples are quantity (sufficient amounts of food), quality (nutritionally balanced food), safety (food that is devoid of harmful substances and can impact health), and culturally acceptable and preferable foods (those that support traditional or preferred diets).<sup>12</sup> Therefore, access to food affects food choices.

Food access in the local retail food environment is dependent on the spatial proximity of food stores, affordability, cultural appropriateness and healthiness of foods available.<sup>13</sup> Lack of access to healthy food such as fresh fruits and vegetables is often seen in low-income communities.<sup>13–19</sup> Communities with limited healthy foods available to residents are known as ‘food desert’ areas.<sup>20–21</sup> Many resource-poor communities have a large number of fast-food restaurants, liquor stores and convenience stores supplying cheap, processed nutrient-poor foods.<sup>22</sup> It therefore follows that people with low incomes may have poor food choices that include cheap, energy-nutrient dense and nutrient-deficient foods. Low-income individuals living in food deserts are at a greater risk of developing NCDs in comparison to individuals in high-resource communities.<sup>17–18–20–23–24</sup> Increasing access to affordable and healthy food in resource-poor communities is therefore important.

## STUDY RATIONALE

The rise in interest in the food environment can be attributed to the demand to improve dietary, nutritional and health outcomes.<sup>25</sup> The food environment is an important approach for implementing interventions that support healthy diets and address malnutrition as this is where consumers make decisions on what food to buy and consume.<sup>26</sup> Retail food environments influence the type of food purchased and consumed.<sup>5</sup> The accessibility of healthy food in the retail food environment enables people to have better quality diets with fruit and vegetables, and therefore better health outcomes. There are many intervention strategies used to improve access to food in urban and rural communities; these include

increasing the number of chain supermarkets in food deserts, increasing the number and supporting farmers markets, establishing community gardens, increasing the price of unhealthy food and serving healthier convenience foods.<sup>13–21–27–28</sup>

While there are interventions to improve access to food in urban and rural communities, many people are still struggling to purchase and consume healthy food.<sup>13–21–27–28</sup> Healthy food access is important for enhancing the economy and improving community health. To address the healthy food access issue in communities, it is necessary understanding the role of the local retail food environment in enabling or hindering resource-poor community residents’ access to healthy food for making better food choices. Past reviews conducted on the food environment have focused on associations between school food environments and children’s diet<sup>29–30</sup> child weight status,<sup>31</sup> food environment in high-income countries<sup>32</sup> and low-income and middle-income countries.<sup>25</sup> The majority of literature to date has also focused on the food environment and overweight/obesity and physical activity and not given much attention to dietary outcomes more especially food choices. To our knowledge, this will be the first review to examine the association of the local retail food environment and food access on the food choices of adults. It is important to understand the relationship between the local retail food environment and food access and adult food choices so that appropriate interventions can be created to prevent NCDs in adult population residing in resource-poor communities. The aim of the scoping review is to gain an understanding of what is the association between adult food choices and the factors that determine healthy food access in the local retail food environment of resource-poor communities.

The objectives are to:

1. assess whether adult food choices are associated with the local retail food environment in resource-poor communities; and
2. determine the barriers and facilitators for healthy food access in resource-poor communities.

## METHODS AND ANALYSIS

### Protocol structure

The protocol was developed following the framework described by Arksey and O’Malley.<sup>33</sup> The framework includes five stages namely (1) identifying the research question; (2) identifying relevant studies; (3) study selection; (4) charting the data and (5) collating, summarising and reporting the results.<sup>33</sup> The final protocol was registered with the Open Science Framework on 9 September 2020 (<https://osf.io/shf93>).

### Step 1: identifying research questions

The population, concept and context (PCC) search strategy was used for the development of the research questions.<sup>34</sup> This search strategy will enable the

**Table 1** Literature search strategy

Concept	MeSH terms/Keywords
Diet/food choice	<i>MeSH terms:</i> Diet, healthy OR Diet western OR Diet high fat <i>Keywords:</i> Food choice OR food behaviours OR adult OR food OR fruit OR vegetable OR nutrition OR processed food OR salty food OR fatty foods OR sugar-sweetened beverages OR fast food OR street food.
Local retail food environment	<i>Keywords:</i> Food environment OR nutrition environment OR Local retail food environment OR neighbourhood OR consumer nutrition environment OR community nutrition environment OR food desert OR food swamp
Resource poor	<i>MeSH terms:</i> Low income OR low-income population OR poverty. <i>Keywords:</i> Low income OR low socio-economic status OR disadvantaged OR resource poor OR poor OR deprived
Food access	<i>MeSH terms:</i> Food deserts OR Food security. <i>Keywords:</i> Food access OR food availability OR food cost OR food affordability OR food price OR food quality
Store type	<i>Keywords:</i> Food store OR supermarket OR grocery store OR convenience store OR corner store OR fast food OR restaurant OR street vendor

MeSH, medical subject headings.

identification of relevant studies to meet the aim of the scoping review.<sup>35</sup> For this scoping review, the population is male and female adults, the concept is food choices and the context is the local retail food environment and food access in resource-poor settings. To understand the association between food choices and the food environment and food access, the following research questions will be used to guide the search strategy.

- ▶ What is the association between adult food choices and the local retail food environment in resource-poor communities?
- ▶ Does food accessible in the local retail food environment influence healthy food choices?
- ▶ What characteristics of the local retail food environment enable food access or limit food access?

### Step 2: identifying relevant studies

A search on published literature will be conducted using the following databases, PubMed/Medline, CINAHL, EBSCOhost, Green FILE, PsycARTICLES, Social Science

Research Network, Scopus, Science Direct and Web of Science. [Table 1](#) presents a summary of the search keywords or medical subject headings (MeSH) terms that will be used. The Boolean (AND, OR) method will be used to combine search terms. The original search strategy was developed in PubMed and will be adapted to the other databases. The PubMed search strategy is presented in [table 2](#). A reference list of bibliographies of studies found will be checked for additional sources.

### Step 3: study selection

Eligibility criteria will be used to ensure that the studies included in the scoping review are relevant to the research questions.

### Inclusion criteria

- ▶ Observational studies (ie, cohort, cross-sectional, case-control and ecological studies) reporting on the association between adult food choices (outcome)

**Table 2** Electronic search record of PubMed database

Date	Keyword searched	Database used	Number of publications retrieved
02 February 2021	(((Food choice[Title/Abstract] OR food behaviours[Title/Abstract] OR adult[Title/Abstract] OR food[Title/Abstract] OR fruit[Title/Abstract] OR vegetable[Title/Abstract] OR diet[Title/Abstract] OR nutrition[Title/Abstract] OR processed food[Title/Abstract] OR salty food[Title/Abstract] OR fatty foods[Title/Abstract] OR sugar-sweetened beverages[Title/Abstract] OR fast food[Title/Abstract] OR street food.[Title/Abstract]) AND (Food environment[Title/Abstract] OR nutrition environment[Title/Abstract] OR Local retail food environment[Title/Abstract] OR neighbourhood[Title/Abstract] OR consumer nutrition environment[Title/Abstract] OR community nutrition environment[Title/Abstract] OR food desert[Title/Abstract] OR food swamp[Title/Abstract])) AND (Low income[Title/Abstract] OR low socio-economic status[Title/Abstract] OR disadvantaged[Title/Abstract] OR resource poor[Title/Abstract] OR poor[Title/Abstract] OR poverty[Title/Abstract] OR deprived[Title/Abstract])) AND (Food access[Title/Abstract] OR food availability[Title/Abstract] OR food cost[Title/Abstract] OR food affordability[Title/Abstract] OR food price[Title/Abstract] OR food quality[Title/Abstract])) AND (Food store[Title/Abstract] OR supermarket[Title/Abstract] OR grocery store[Title/Abstract] OR convenience store[Title/Abstract] OR corner store[Title/Abstract] OR fast food[Title/Abstract] OR restaurant[Title/Abstract] OR street vendor[Title/Abstract]) Filters applied: Results by year 2005–2021	PubMed	69

and the local retail food environment and food access (exposures) in resource-poor communities.

- ▶ Empirical and theoretical studies.
- ▶ Studies including adults 18–65 years old.
- ▶ Studies on the food environment outside the home environment but within the retail food environment, which is the community and the consumer food environment.
- ▶ Studies on food access, food choices and diets of adults in resource-poor communities.
- ▶ English peer-reviewed journal articles from July 2005 to January 2021.

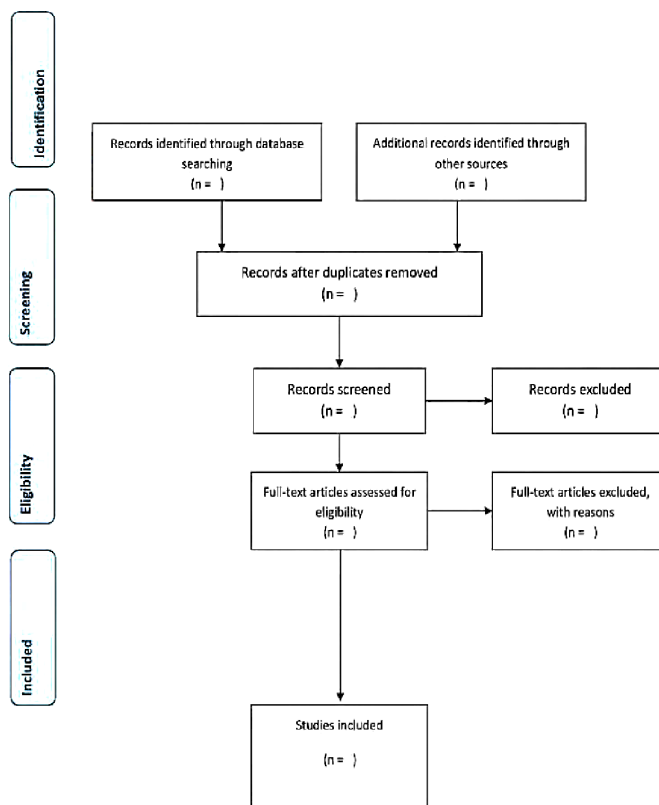
#### Exclusion criteria

- ▶ Experimental studies (randomised controlled trials), systematic reviews and meta-analysis.
- ▶ Research not reported in peer-reviewed journals, studies discussing organisational food environment (home, school and work) and information environment (television advertising).
- ▶ Studies on children, pregnant women and the elderly.
- ▶ Studies that only focus on the food environment and nutritional status.
- ▶ Studies that focus on indirect measures of diet, such as food purchasing or the number of trips to food stores.
- ▶ Papers written in another language besides English and research papers published before July 2005 will be excluded from the study.

Eligible articles will be uploaded into EndnoteX9 library, and duplicates identified and removed. Two levels will be followed when screening articles. Level one involves two reviewers screening the title and abstracts (TIABS) of searched articles to identify eligible ones. In level two, the two reviewers will read the full-text articles to determine whether they meet the eligibility criteria. Both levels of screening will be performed on the Rayaan Qatar Computing Research Institute (QCRI) systematic reviews web application.<sup>36</sup> A third reviewer will be consulted should there be any disagreement on full-text articles to reach a consensus. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist will be used to guide the selection process.<sup>37</sup> The study selection process is presented in the PRISMA flow diagram (see figure 1).<sup>38</sup>

#### Step 4: charting the data

The PCC format will be used to guide the data extraction. A data charting form, as per the framework of Arksey and O'Malley,<sup>33</sup> will be developed to extract data from studies included (see table 3). The data extraction form will be piloted by two reviewers on 10% of the sample of included studies.<sup>39</sup> This will be done to ensure that reviewers understand the data collection procedure and whether all relevant information is correctly captured. The data extraction form will be revised should the reviewers decide that relevant items are not adequately captured. Inter-rater reliability will be attained by comparing 20%



**Figure 1** Preferred Reporting Items for Systematic Reviews and Meta-Analysis flow diagram for the scoping review process.

of the sample of independently screened papers by the two reviewers.<sup>39</sup> Disagreements will be discussed by the two reviewers to reach consensus or through consulting a third reviewer.

#### Reducing bias

Eligibility criteria will be used to reduce selection bias. Two reviewers will review eligible studies and this will reduce error and increase reliability of the findings of the scoping review. Methods to reduce bias are presented in table 4. A systematic approach will be followed when reviewing the research evidence to ensure the relevance and validity of results. By including different types of evidence or data sources, such as quantitative or qualitative research, expert opinion and policy documents, heterogeneity will be ensured.<sup>35</sup>

#### Step 5: collating, summarising and reporting results

The process of collating, summarising and reporting results will follow three steps as recommended by Levac *et al.*<sup>35</sup> In the first step, a descriptive numerical summary for quantitative studies and thematic analysis for qualitative studies will be done. The descriptive numerical summary will state the number of studies included, types of study design, year of publication, characteristics of populations and the countries where the studies were done. With regards to the qualitative analysis, descriptive themes will be developed by categorising ideas by topic/concept. In the second step, the results and outcome of the study



**Table 3** Data extraction form

1. Authors		
2. Title of study		
3. Year of publication		
4. Aim/objective of the study		
5. Study setting (location/country)		
6. Study participants (number, age, gender and ethnicity)		
7. Sampling method		
8. Study design/publication type	Cross-sectional: <input type="checkbox"/>	Cohort <input type="checkbox"/>
	Case-control <input type="checkbox"/>	Others
9. Data collection method	Quantitative <input type="checkbox"/>	Mixed method <input type="checkbox"/>
	Qualitative <input type="checkbox"/>	Other
10. Data analysis		
11. Reported outcomes	Study findings relevant to study objectives.	
12. Most relative findings	Findings as relates to food choices and healthy diet measured by fruit and vegetable intake, various food group intake, intake of salty and fatty foods, sugar-sweetened beverage intake, fast-food intake, diet quality, energy and micronutrient intake and healthy diet score vs unhealthy diet scores. <sup>30</sup>	
13. Facilitators	Describe the factors that enable healthy food choices and food access in the local retail food environment.	
14. Barriers	Describe the factors that hinder healthy food choices and food access in the local retail food environment.	

in relation to the aim of the research question will be discussed. The third step involves reporting the implications of the findings in terms of future research, practice and policy.<sup>34</sup>

### Patient and public involvement

There was no patient or public involvement in the design of this protocol.

**Table 4** Types of bias and resolution

Bias	Resolution
Selection bias	<ul style="list-style-type: none"> <li>▶ Clear definition of exposure and outcomes in the inclusion and exclusion criteria.</li> <li>▶ Two reviewers will independently screen TIABS and full text articles and extract data to reduce bias.</li> <li>▶ Inter-rater reliability will be assessed to reduce bias.</li> <li>▶ The Rayyan software will be used for screening TIABS and full text articles. This software allows for 'blind screening' among reviewers, this will reduce bias.</li> </ul>
Publishing bias	All research findings whether positive or negative will be reported in the findings.
Language bias	Only English articles were selected. Literature states that excluding non-English studies does not impact outcomes of most reviews.

### ETHICS AND DISSEMINATION

Ethical approval will not be required for the review, as data from published studies will be used for the analysis. The results of this scoping review will form part of a PhD thesis that will be submitted to the University of the Western Cape. The review findings will also be presented at conferences and published in a peer-reviewed journal.

**Contributors** SSM and MF conceived the idea and developed the research questions and methods for the protocol. SSM was responsible for drafting the manuscript. MF supervised the writing of the protocol. MF, JH and EK critically revised the manuscript for its methodological and scientific content. All authors approved the final version of the manuscript.

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**Patient consent for publication** Not required.

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