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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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3 **Adult food choices in association with the local retail food environment and food access**
4 **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-analysis Extension for Scoping Reviews (PRISMA-ScR) guidelines and the framework process by Arksey and O'Malley. Observational studies, published from January 2011 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.

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>

Keywords: Food choices, local retail environment, resource-poor communities, healthy food access, healthy diet, food desert.

ARTICLE SUMMARY

Strengths and limitations of this study

- In this systematic approach, findings from a body of knowledge that is heterogeneous in terms of methods and discipline will be summarised.
- Several multidisciplinary databases will be used in the search, as the food environment topic is extensive.
- A quality assessment will be performed on selected studies.
- 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.
- Only studies published in English will be included, therefore, possibly limiting the number.

INTRODUCTION

Food choices are defined as foods selected and consumed based on an individual's decision which is influenced by a combination of individual, environmental and economic factors. Individual factors that determine food choices include taste preference, psychological and physiological factors as well as the influence of society. Environmental and economic factors include income, cost of food production, manufacturing, distribution and retailing, taxing, pricing policies, the diversity of foods available and the advertising of foods by the food industry.¹ Geography, season, education, demography, disposable income, government and other support services, urbanisation, globalisation, marketing, religion, culture, ethnicity, social networks, time and the consumer preferences also determine food choices.¹⁻⁵ Food choices are also a result of the relationship between individual factors and the food environment.⁶

Glanz and colleagues⁷ created a conceptual model depicting four types of food environments. These are the community nutrition environment (location and accessibility of food stores), the consumer nutrition environment (price, promotion and placement of food choices), the organisational nutrition environment (food accessible in other places such as the workplace and school), and the information environment (marketing, media and advertising).⁷ 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

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3 or markets.⁸ The community and the consumer nutrition environment, the interest topics of this
4 study, will be referred to as the local retail food environment.
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7 The local retail food environment is an important determinant of food choices and may
8 influence individual, family and population-level health.⁹ Furthermore, it may influence dietary
9 patterns and food choices.^{9,10} The lack of access to healthy food within this environment may
10 result in unhealthy food choices which may lead to obesity and the development of non-
11 communicable diseases (NCD) such as cancers, cardiovascular diseases and type 2 diabetes
12 mellitus.¹⁰⁻¹² The local retail food environment is also a determining factor for food access.⁹
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18 Food access relates to the physical and economic access to food.¹³ Access to food means that
19 it must be physically procured by individuals and be economically accessible. Thus, people can
20 afford to buy the food that is available in the local retail food environment, and in adequate
21 amounts.¹³ Access to food consists of several components. Examples are quantity (sufficient
22 amounts of food), quality (nutritionally balanced food), safety (food that is devoid of harmful
23 substances and can impact health), and culturally acceptable and preferable foods (those that
24 support traditional or preferred diets).¹⁴ Therefore, access to food affects food choices.
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31 Socio-economic factors such as education level, occupation and income, and nutrition
32 knowledge may be barriers and enablers to healthy food choices. Food purchasing decisions
33 are influenced by cost of foods, transportation and distance to supermarkets or large grocery
34 stores, and the quality of food in stores.¹⁵ Also, retailers' product suppliers, product
35 availability, and purchasing policies impact access to food and therefore food choices.¹⁶
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40 Food access in the local retail food environment is dependent on the spatial proximity of food
41 stores, affordability, cultural appropriateness and healthiness of foods available.¹⁵ Lack of
42 access to healthy food such as fresh fruits and vegetables is often seen in low-income
43 communities.^{15,17-21} Communities with limited healthy foods available to residents are known
44 as 'food desert' areas.^{22,23} Convenience stores and fast-food restaurants generally stock more
45 unhealthy foods,²⁴ while supermarkets, grocery stores, farmers markets, cooperatives, mobile
46 markets and other vendors selling fresh food sell more healthy foods.²⁵ Many resource-poor
47 communities have a large number of fast-food restaurants, liquor stores and convenience stores
48 supplying cheap, processed nutrient-poor foods.²⁵ It therefore follows that people with low
49 incomes may have poor food choices that include cheap, energy-nutrient dense and nutrient-
50 deficient foods. Low-income individuals living in food deserts are at a greater risk of
51 developing NCDs in comparison to individuals in high-resource communities.^{19,20,22,26,27}
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3 Increasing access to affordable and healthy food in resource-poor communities is therefore
4 important.
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7 Strategies to improve access in the local retail food environment of resource-poor communities
8 include increasing geographic access to stores that sell healthy food. These include establishing
9 more chain supermarkets in food deserts,²¹ changing food products supplied in convenience
10 stores, raising the number of farmers' markets and stands, and establishing community
11 gardens.²⁸⁻²⁹ Other strategies are, creating pricing schemes in supermarkets, whereby prices of
12 healthy foods are reduced, and unhealthy food prices are increased.¹⁵ Supermarkets may also
13 sell healthier ready-to-eat meals instead of unhealthy ready-to-eat meals.³⁰
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22 **STUDY RATIONALE**

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24 Retail food environments influence the type of food purchased and consumed. The accessibility
25 of healthy food in the retail food environment enables people to have better quality diets with
26 fruit and vegetables, and therefore better health outcomes. While there are interventions to
27 improve access to food in urban and rural communities, many people are still struggling to
28 purchase and consume healthy food. Strategies to improve healthy food access should consider
29 resource-poor communities and individuals with a low income, as they are vulnerable to
30 adopting unhealthy eating habits and making bad food choices compromising their health.
31 Healthy food access is important for enhancing the economy and improving community health.
32 To address the healthy food access issue in communities, it is necessary understanding the role
33 of the local food environment in enabling or hindering resource-poor community residents'
34 access to healthy food for making better food choices. The aim of the scoping review is to gain
35 an understanding of what influences adult food choices and the factors that determine healthy
36 food access in the local retail food environment of resource-poor communities.
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47 The objectives are to:

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49 (i) assess whether adult food choices are associated with the local retail food environment in
50 resource-poor communities; and
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52 (ii) determine the barriers and facilitators for healthy food access in resource-poor
53 communities.
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METHODS AND ANALYSIS

Protocol Structure

The protocol was developed following the framework described by Arksey and O'Malley.³¹ The framework includes five stages namely (i) identifying the research question; (ii) identifying relevant studies; (iii) study selection; (iv) charting the data, and (v) collating, summarising and reporting the results.³¹ The final protocol was registered with the Open Science Framework on 9 September 2020 (<https://osf.io/shf93>).

Step 1: identifying research questions

To ensure that the research questions are aligned with the aim of the scoping review, the target population, concept, and outcome of interest need to be explicitly stated.³² The population, concept and context (PCC) format was therefore used to guide the research question development.³³ For this scoping review, the population is male and female adults, the concept is food choices, and the context is the local 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 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 MeSH (medical subject headings) terms that will be used. A reference list of bibliographies of studies found will be checked for additional sources.

Table 1 Literature search strategy

Concept	Search terms
Diet/Food choice	Food choice OR food behaviours OR adult OR food OR fruit OR vegetable OR diet 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	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	Low income OR low socio-economic status OR disadvantaged OR resource poor OR poor OR poverty OR deprived
Food access	Food access OR food availability OR food cost OR food affordability OR food price OR food quality
Store type	Food store OR supermarket OR grocery store OR convenience store OR corner store OR fast food OR restaurant OR street vendor

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

- 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 January 2011 to January 2021.

Exclusion criteria

- 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 2011 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 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. A third reviewer will be consulted should there be any disagreement on full-text articles to reach a consensus. The PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-analysis extension for Scoping Reviews) checklist will be used to guide the selection process.³⁴

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,³¹ will be developed to extract data from studies included. The extracted data will include the author and date, title of study, publication, the aim of the study, study setting, study population, sampling method, study design, data collection methods, data analysis, conclusion, outcome and most relative findings. The outcome of the study is food choice and healthy diet which will be 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, healthy diet score versus unhealthy diet scores and food purchasing behaviour.³⁵ All data forms will be stored in an Excel sheet, with the data extraction forms being piloted before the commencement of the review. The first ten articles will be used in the pilot study, which will be conducted by two reviewers.

Reducing bias

Eligibility criteria will be used to reduce selection bias. More than one reviewer will be used in the scoping review process to reduce error and increase reliability. 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.³⁴

Step 5: collating, summarising and reporting results

The process of collating, summarising and reporting results will follow three steps as recommended by Levac and colleagues.³² In the first step, a descriptive numerical summary for quantitative studies and qualitative 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 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.³³

Patient and public involvement

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

CONCLUSION

In this scoping review, the findings from a body of knowledge on adult food choices and its association with the local retail environment will be summarised. The review will also provide insight into understanding what influences adult food choices and the factors that determine healthy food access in the local retail food environment of resource-poor communities.

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.

Author Contribution 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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10 SAMRC.
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12 **Competing interests** None.
13

14 **Patient consent** Not required.
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17

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Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	
Limitations	20	Discuss the limitations of the scoping review process.	
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: 10.7326/M18-0850.



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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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3 **Adult food choices in association with the local retail food environment and food access**
4 **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-analysis 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>

Keywords: Food choices, local retail environment, resource-poor communities, healthy food access, healthy diet, food desert.

ARTICLE SUMMARY

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.

INTRODUCTION

Malnutrition in the form of overweight, obesity and underweight is the leading cause of disease globally.¹ Dietary related disease risk is determined by food choices and dietary consumption.² Food choices are defined as foods selected and consumed based on an individual's decision which is influenced by a combination of individual, environmental and economic factors.³ Food choices are also a result of the relationship between individual factors and the food environment.⁴ Glanz and colleagues 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 i.e., restaurant, school or work cafeteria, price, promotion and placement of food choices).⁵ 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.⁶ 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.⁷ Furthermore, it may influence dietary

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3 patterns and food choices.^{7,8} The lack of access to healthy food within this environment may
4 result in unhealthy food choices, which may lead to obesity and the development of non-
5 communicable diseases (NCD) such as cancers, cardiovascular diseases and type 2 diabetes
6 mellitus.⁸⁻¹⁰ The local retail food environment is also a determining factor for food access.⁷
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10 Food access relates to the physical and economic access to food.¹¹ Access to food means that
11 it must be physically procured by individuals and be economically accessible. Thus, people can
12 afford to buy the food that is available in the local retail food environment, and in adequate
13 amounts.¹¹ Access to food consists of several components. Examples are quantity (sufficient
14 amounts of food), quality (nutritionally balanced food), safety (food that is devoid of harmful
15 substances and can impact health), and culturally acceptable and preferable foods (those that
16 support traditional or preferred diets).¹² Therefore, access to food affects food choices.
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23 Food access in the local retail food environment is dependent on the spatial proximity of food
24 stores, affordability, cultural appropriateness and healthiness of foods available.¹³ Lack of
25 access to healthy food such as fresh fruits and vegetables is often seen in low-income
26 communities.¹³⁻¹⁹ Communities with limited healthy foods available to residents are known as
27 'food desert' areas.^{20,21} Many resource-poor communities have a large number of fast-food
28 restaurants, liquor stores and convenience stores supplying cheap, processed nutrient-poor
29 foods.²² It therefore follows that people with low incomes may have poor food choices that
30 include cheap, energy-nutrient dense and nutrient-deficient foods. Low-income individuals
31 living in food deserts are at a greater risk of developing NCDs in comparison to individuals in
32 high-resource communities.^{17,18,,20,23,24} Increasing access to affordable and healthy food in
33 resource-poor communities is therefore important.
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46 **STUDY RATIONALE**

47 The rise in interest in the food environment can be attributed to the demand to improve dietary,
48 nutritional and health outcomes.²⁵ The food environment is an important approach for
49 implementing interventions that support healthy diets and address malnutrition as this is where
50 consumers make decisions on what food to buy and consume.²⁶ Retail food environments
51 influence the type of food purchased and consumed.⁵ The accessibility of healthy food in the
52 retail food environment enables people to have better quality diets with fruit and vegetables,
53 and therefore better health outcomes. There are many intervention strategies used to improve
54 access to food in urban and rural communities, these include increasing the number of chain
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3 supermarkets in food deserts, increasing the number and supporting farmers markets,
4 establishing community gardens, increasing the price of unhealthy food and serving healthier
5 convenience foods.^{13,21, 27-28}
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8 While there are interventions to improve access to food in urban and rural communities many
9 people are still struggling to purchase and consume healthy food.^{13,21, 27-28} Healthy food access
10 is important for enhancing the economy and improving community health. To address the
11 healthy food access issue in communities, it is necessary understanding the role of the local
12 food environment in enabling or hindering resource-poor community residents' access to
13 healthy food for making better food choices. Past reviews conducted on the food environment
14 have focused on associations between school food environments and children's diet^{29,30} child
15 weight status,³¹ food environment in high income countries³² and low- and middle-income
16 countries.²⁵ The majority of literature to date has also focused on the food environment and
17 overweight/obesity and physical activity and not given much attention to dietary outcomes
18 more especially food choices. To our knowledge this will be the first review to examine the
19 association of the local retail food environment and food access on the food choices of adults.
20 It is important to understand the relationship between the local retail food environment and
21 food access and adult food choices so that appropriate interventions can be created to prevent
22 NCDs in adult population residing in resource poor communities. The aim of the scoping
23 review is to gain an understanding of what is the association between adult food choices and
24 the factors that determine healthy food access in the local retail food environment of resource-
25 poor communities.
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40 The objectives are to:

- 41 (i) assess whether adult food choices are associated with the local retail food environment in
42 resource-poor communities; and
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44 (ii) determine the barriers and facilitators for healthy food access in resource-poor
45 communities.
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51 **METHODS AND ANALYSIS**

52 **Protocol Structure**

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54 The protocol was developed following the framework described by Arksey and O'Malley.³³
55 The framework includes five stages namely (i) identifying the research question; (ii)
56 identifying relevant studies; (iii) study selection; (iv) charting the data, and (v) collating,
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3 summarising and reporting the results.³³ The final protocol was registered with the Open
4 Science Framework on 9 September 2020 (<https://osf.io/shf93>).
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9 **Step 1: identifying research questions**

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11 The population, concept and context (PCC) search strategy was used for the development of
12 the research questions.³⁴ This search strategy will enable the identification of relevant studies
13 to meet the aim of the scoping review.³⁵ For this scoping review, the population is male and
14 female adults, the concept is food choices, and the context is the local retail food environment
15 and food access in resource-poor settings. To understand the association between food choices
16 and the food environment and food access, the following research questions will be used to
17 guide the search strategy.
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- 23 • What is the association between adult food choices and the local retail food
24 environment in resource-poor communities?
- 25 • Does food accessible in the local retail food environment influence healthy food
26 choices?
- 27 • What characteristics of the local retail food environment enable food access or limit
28 food access?
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37 **Step 2: identifying relevant studies**

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39 A search on published literature will be conducted using the following databases,
40 PubMed/MEDLINE, CINAHL, EBSCOhost, Green FILE, PsycARTICLES, Social Science
41 Research Network, Scopus, Science Direct and Web of Science. Table 1 presents a summary
42 of the search keywords or MeSH (medical subject headings) terms that will be used. The
43 Boolean (AND, OR) method will be used to combine search terms. The original search strategy
44 was developed in PubMed and will be adapted to the other databases. The PubMed search
45 strategy is presented in table 2. A reference list of bibliographies of studies found will be
46 checked for additional sources.
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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

Table 2 Electronic search record of PubMed database

Date	Keyword searched	Database used	Number of publications retrieved
02.02.2021	(((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

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 (i.e. cohort, cross-sectional, case-control and ecological studies) reporting on the association between adult food choices (outcome) 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 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 Rayyan QCRI systematic

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2 reviews web application.³⁶ A third reviewer will be consulted should there be any disagreement
3 on full-text articles to reach a consensus. The PRISMA-ScR (Preferred Reporting Items for
4 Systematic Reviews and Meta-analysis extension for Scoping Reviews) checklist will be used
5 to guide the selection process.³⁷ The study selection process is presented in the PRISMA flow
6 diagram (see figure 1).³⁸
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11 12 13 14 **Step 4: charting the data**

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16 The PCC format will be used to guide the data extraction. A data charting form, as per the
17 framework of Arksey and O'Malley,³³ will be developed to extract data from studies included
18 (see table 3). The data extraction form will be piloted by two reviewers on 10% of the sample
19 of included studies.³⁹ This will be done to ensure that reviewers understand the data collection
20 procedure and whether all relevant information is correctly captured. The data extraction form
21 will be revised should the reviewers decide that relevant items are not adequately captured.
22 Inter-rater reliability will be attained by comparing 20% of the sample of independently
23 screened papers by the two reviewers.³⁹ Disagreements will be discussed by the two reviewers
24 to reach consensus or through consulting a third reviewer.
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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, Ethnicity)	
7. Sampling method	
8. Study design/publication type	Cross-sectional <input type="checkbox"/> Cohort <input type="checkbox"/> Case-control <input type="checkbox"/> Other: <input type="checkbox"/>
9. Data collection method	Quantitative <input type="checkbox"/> Mixed method <input type="checkbox"/> Qualitative <input type="checkbox"/> Other: <input type="checkbox"/>
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, healthy diet score versus unhealthy diet scores and food purchasing behaviour. ³⁰
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.

Reducing bias

Eligibility criteria will be used to reduce selection bias. Two reviewers will review eligible studies 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.³⁵

Table 4 Types of bias and resolution

Bias	Resolution
Selection bias	<ul style="list-style-type: none"> - Clear definition of exposure and outcomes in the inclusion and exclusion criteria. - Two reviewers will independently screen title, abstracts and full text articles and extracting data to reduce bias. - Inter-rater reliability will be assessed to reduce bias. - The Rayyan software will be used for screening titles, abstracts and full text articles. This software allows for “blind screening” amongst reviewers, this will reduce bias.
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 review.

Step 5: collating, summarising and reporting results

The process of collating, summarising and reporting results will follow three steps as recommended by Levac and colleagues.³⁵ In the first step, a descriptive numerical summary for quantitative studies and qualitative 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 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.³⁴

Patient and public involvement

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

CONCLUSION

In this systematic scoping review, the findings from a body of knowledge on adult food choices and its association with the local retail environment will be summarised. The review will also provide insight into understanding what influences adult food choices and the factors that determine healthy food access in the local retail food environment of resource-poor communities.

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.

Author Contributions 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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Disclaimer The views expressed are those of the authors and not necessarily those of the SAMRC.

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Patient consent Not required.

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For peer review only

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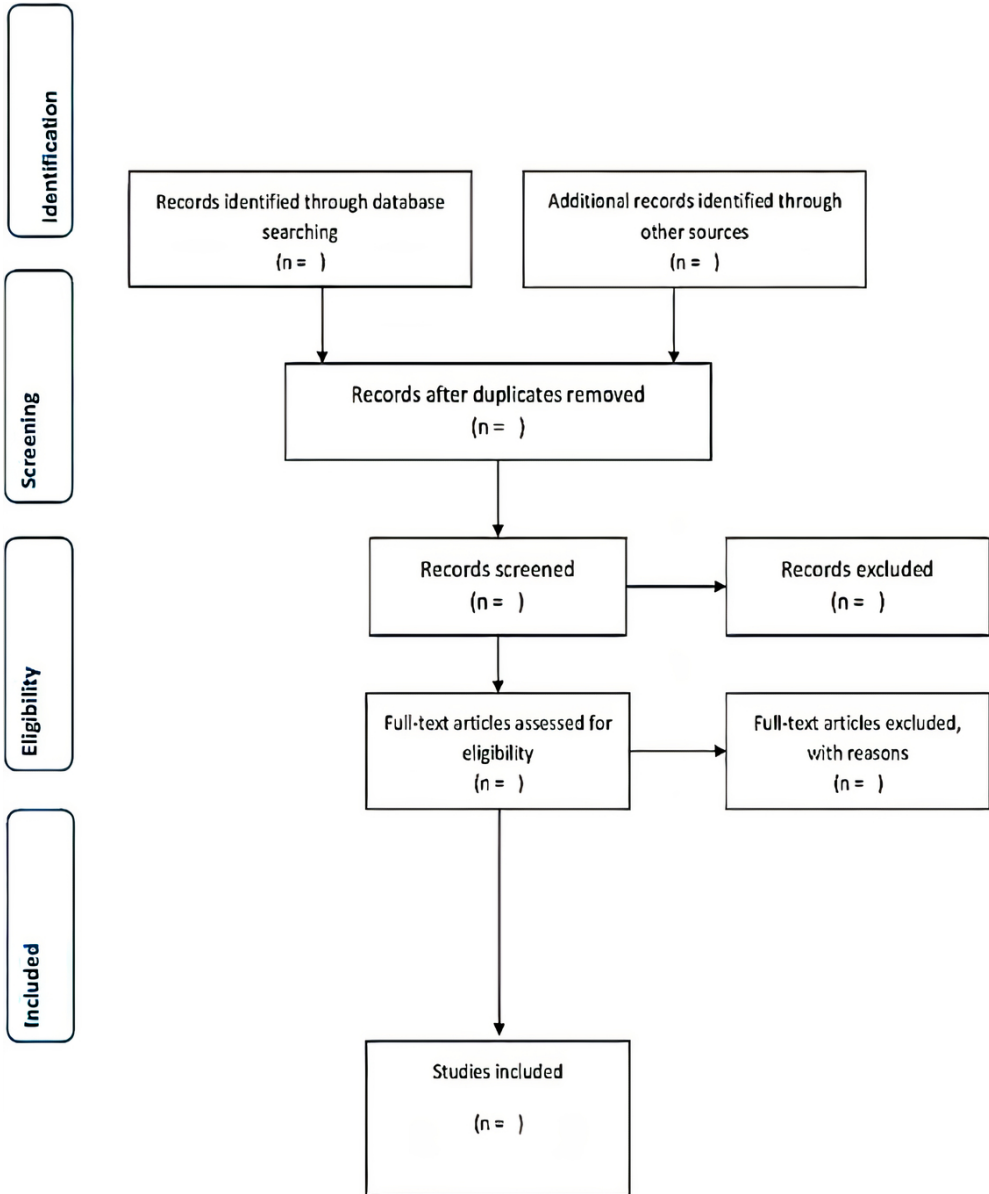


Figure 1 PRISMA Flow diagram for scoping review³⁸

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	4-5
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	5
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	6
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	8
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	6
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	7
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	8-9
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	9
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	10
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	N/A



SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	11
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	N/A No results as this is a protocol
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	N/A No results as this is a protocol
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	N/A
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	N/A No results as this is a protocol
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	N/A No results as this is a protocol
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	N/A No results as this is a protocol
Limitations	20	Discuss the limitations of the scoping review process.	N/A No results as this is a protocol
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	12 Conclusion on study protocol not the results.
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	12

JB1 = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: [10.7326/M18-0850](https://doi.org/10.7326/M18-0850).



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BMJ Open

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

Journal:	<i>BMJ Open</i>
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Primary Subject Heading:	Public health
Secondary Subject Heading:	Epidemiology, Research methods
Keywords:	PUBLIC HEALTH, EPIDEMIOLOGY, NUTRITION & DIETETICS

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3 **Adult food choices in association with the local retail food environment and food access**
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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-analysis 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>

Keywords: Food choices, local retail environment, resource-poor communities, healthy food access, healthy diet, food desert.

1 ARTICLE SUMMARY

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.

3 INTRODUCTION

Malnutrition in the form of overweight, obesity and underweight is the leading cause of disease globally.¹ Dietary related disease risk is determined by food choices and dietary consumption.² Food choices are defined as foods selected and consumed based on an individual's decision which is influenced by a combination of individual, environmental and economic factors.³ Food choices are also a result of the relationship between individual factors and the food environment.⁴ Glanz and colleagues 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 i.e., restaurant, school or work cafeteria, price, promotion and placement of food choices).⁵ 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.⁶ 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.⁷ Furthermore, it may influence dietary

22 patterns and food choices.^{7,8} The lack of access to healthy food within this environment may
23 result in unhealthy food choices, which may lead to obesity and the development of non-
24 communicable diseases (NCD) such as cancers, cardiovascular diseases and type 2 diabetes
25 mellitus.⁸⁻¹⁰ The local retail food environment is also a determining factor for food access.⁷

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

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

45 **STUDY RATIONALE**

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

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3 54 supermarkets in food deserts, increasing the number and supporting farmers markets,
4 55 establishing community gardens, increasing the price of unhealthy food and serving healthier
5 56 convenience foods.^{13,21, 27-28}
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8 57 While there are interventions to improve access to food in urban and rural communities many
9 58 people are still struggling to purchase and consume healthy food.^{13,21, 27-28} Healthy food access
11 59 is important for enhancing the economy and improving community health. To address the
12 60 healthy food access issue in communities, it is necessary understanding the role of the local
13 61 food environment in enabling or hindering resource-poor community residents' access to
14 62 healthy food for making better food choices. Past reviews conducted on the food environment
15 63 have focused on associations between school food environments and children's diet^{29,30} child
16 64 weight status,³¹ food environment in high income countries³² and low- and middle-income
17 65 countries.²⁵ The majority of literature to date has also focused on the food environment and
18 66 overweight/obesity and physical activity and not given much attention to dietary outcomes
19 67 more especially food choices. To our knowledge this will be the first review to examine the
20 68 association of the local retail food environment and food access on the food choices of adults.
21 69 It is important to understand the relationship between the local retail food environment and
22 70 food access and adult food choices so that appropriate interventions can be created to prevent
23 71 NCDs in adult population residing in resource poor communities. The aim of the scoping
24 72 review is to gain an understanding of what is the association between adult food choices and
25 73 the factors that determine healthy food access in the local retail food environment of resource-
26 74 poor communities.

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40 75 The objectives are to:

- 41 76 (i) assess whether adult food choices are associated with the local retail food environment in
42 77 resource-poor communities; and
43 78 (ii) determine the barriers and facilitators for healthy food access in resource-poor
44 79 communities.
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50 51 81 **METHODS AND ANALYSIS**

52 53 82 **Protocol Structure**

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56 83 The protocol was developed following the framework described by Arksey and O'Malley.³³
57 84 The framework includes five stages namely (i) identifying the research question; (ii)
58 85 identifying relevant studies; (iii) study selection; (iv) charting the data, and (v) collating,
60

86 summarising and reporting the results.³³ The final protocol was registered with the Open
87 Science Framework on 9 September 2020 (<https://osf.io/shf93>).

88

89 **Step 1: identifying research questions**

90 The population, concept and context (PCC) search strategy was used for the development of
91 the research questions.³⁴ This search strategy will enable the identification of relevant studies
92 to meet the aim of the scoping review.³⁵ For this scoping review, the population is male and
93 female adults, the concept is food choices, and the context is the local retail food environment
94 and food access in resource-poor settings. To understand the association between food choices
95 and the food environment and food access, the following research questions will be used to
96 guide the search strategy.

- 97 • What is the association between adult food choices and the local retail food
98 environment in resource-poor communities?
- 99 • Does food accessible in the local retail food environment influence healthy food
100 choices?
- 101 • What characteristics of the local retail food environment enable food access or limit
102 food access?

103

104 **Step 2: identifying relevant studies**

105 A search on published literature will be conducted using the following databases,
106 PubMed/MEDLINE, CINAHL, EBSCOhost, Green FILE, PsycARTICLES, Social Science
107 Research Network, Scopus, Science Direct and Web of Science. Table 1 presents a summary
108 of the search keywords or MeSH (medical subject headings) terms that will be used. The
109 Boolean (AND, OR) method will be used to combine search terms. The original search strategy
110 was developed in PubMed and will be adapted to the other databases. The PubMed search
111 strategy is presented in table 2. A reference list of bibliographies of studies found will be
112 checked for additional sources.

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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

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Table 2 Electronic search record of PubMed database

Date	Keyword searched	Database used	Number of publications retrieved
02.02.2021	(((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

118 **Step 3: study selection**

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

121

122 **Inclusion criteria**

- 123 • Observational studies (i.e. cohort, cross-sectional, case-control and ecological studies)
124 reporting on the association between adult food choices (outcome) and the local retail food
125 environment and food access (exposures) in resource-poor communities.
- 126 • Empirical and theoretical studies.
- 127 • Studies including adults 18 – 65 years old.
- 128 • Studies on the food environment outside the home environment but within the retail food
129 environment, which is the community and the consumer food environment.
- 130 • Studies on food access, food choices and diets of adults in resource-poor communities.
- 131 • English peer-reviewed journal articles from July 2005 to January 2021.

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133 **Exclusion criteria**

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

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145 Eligible articles will be uploaded into EndnoteX9 library, and duplicates identified and
146 removed. Two levels will be followed when screening articles. Level one involves two
147 reviewers screening the title and abstracts of searched articles to identify eligible ones. In level
148 two, the two reviewers will read the full-text articles to determine whether they meet the
149 eligibility criteria. Both levels of screening will be performed on the Rayyan QCRI systematic

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3 150 reviews web application.³⁶ A third reviewer will be consulted should there be any disagreement
4 151 on full-text articles to reach a consensus. The PRISMA-ScR (Preferred Reporting Items for
5 152 Systematic Reviews and Meta-analysis extension for Scoping Reviews) checklist will be used
6 153 to guide the selection process.³⁷ The study selection process is presented in the PRISMA flow
7 154 diagram (see figure 1).³⁸

11 155

14 156 **Step 4: charting the data**

16 157 The PCC format will be used to guide the data extraction. A data charting form, as per the
17 158 framework of Arksey and O'Malley,³³ will be developed to extract data from studies included
18 159 (see table 3). The data extraction form will be piloted by two reviewers on 10% of the sample
19 160 of included studies.³⁹ This will be done to ensure that reviewers understand the data collection
20 161 procedure and whether all relevant information is correctly captured. The data extraction form
21 162 will be revised should the reviewers decide that relevant items are not adequately captured.
22 163 Inter-rater reliability will be attained by comparing 20% of the sample of independently
23 164 screened papers by the two reviewers.³⁹ Disagreements will be discussed by the two reviewers
24 165 to reach consensus or through consulting a third reviewer.

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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, Ethnicity)	
7. Sampling method	
8. Study design/publication type	Cross-sectional <input type="checkbox"/> Cohort <input type="checkbox"/> Case-control <input type="checkbox"/> Other: <input type="checkbox"/>
9. Data collection method	Quantitative <input type="checkbox"/> Mixed method <input type="checkbox"/> Qualitative <input type="checkbox"/> Other: <input type="checkbox"/>
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, healthy diet score versus unhealthy diet scores and food purchasing behaviour. ³⁰
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.

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182 Reducing bias

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

17 **Table 4 Types of bias and resolution**

Bias	Resolution
Selection bias	<ul style="list-style-type: none"> - Clear definition of exposure and outcomes in the inclusion and exclusion criteria. - Two reviewers will independently screen title, abstracts and full text articles and extracting data to reduce bias. - Inter-rater reliability will be assessed to reduce bias. - The Rayyan software will be used for screening titles, abstracts and full text articles. This software allows for “blind screening” amongst reviewers, this will reduce bias.
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 review.

191 Step 5: collating, summarising and reporting results

192 The process of collating, summarising and reporting results will follow three steps as
 193 recommended by Levac and colleagues.³⁵ In the first step, a descriptive numerical summary
 194 for quantitative studies and qualitative thematic analysis for qualitative studies will be done.
 195 The descriptive numerical summary will state the number of studies included, types of study
 196 design, year of publication, characteristics of populations and the countries where the studies
 197 were done. With regards to the qualitative analysis, descriptive themes will be developed by
 198 categorising ideas by topic/concept. In the second step, the results and outcome of the study in
 199 relation to the aim of the research question will be discussed. The third step involves reporting
 200 the implications of the findings in terms of future research, practice and policy.³⁴

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3 203 **Patient and public involvement**

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5 204 There was no patient or public involvement in the design of this protocol.
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9 206 **ETHICS AND DISSEMINATION**

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11 207 Ethical approval will not be required for the review, as data from published studies will be used
12
13 208 for the analysis. The results of this scoping review will form part of a PhD thesis that will be
14
15 209 submitted to the University of the Western Cape. The review findings will also be presented at
16
17 210 conferences and published in a peer-reviewed journal.
18

19 211

20 212 **Author Contributions** SSM and MF conceived the idea and developed the research questions
21
22 213 and methods for the protocol. SSM was responsible for drafting the manuscript. MF supervised
23
24 214 the writing of the protocol. MF, JH and EK critically revised the manuscript for its
25
26 215 methodological and scientific content. All authors approved the final version of the manuscript.
27

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38
39 222 SAMRC.

40 223 **Competing interests** None declared.

41
42 224 **Patient consent** Not required.

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44 225 **Provenance and peer review** Not commissioned; externally peer-reviewed.
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57 233 **Figure caption**

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59 234 **Figure 1:** PRISMA Flow diagram for the scoping review process.
60

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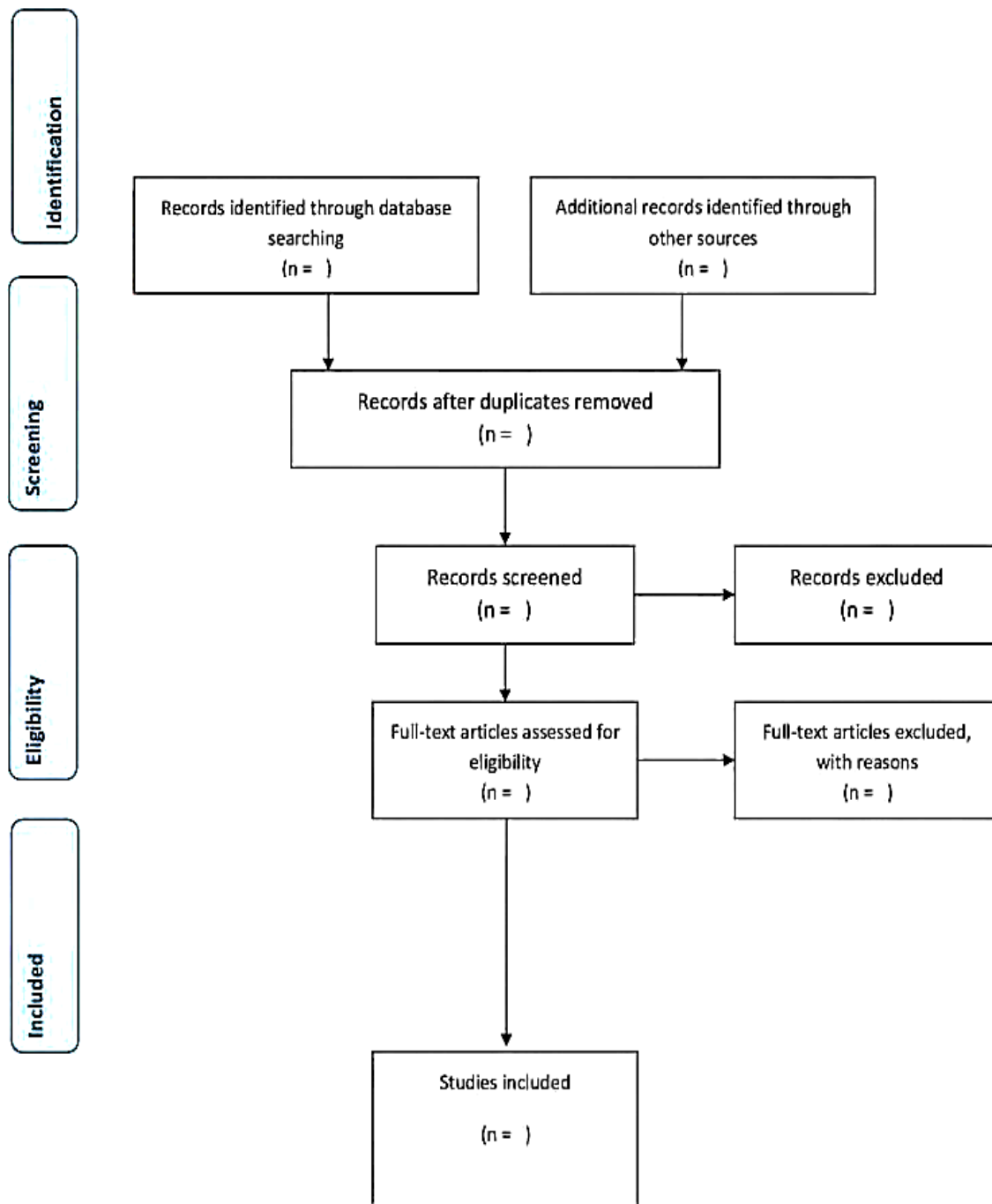


Figure 1: PRISMA Flow diagram for the scoping review process³⁸

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	4-5
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	5
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	6
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	8
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	6
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	7
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	8-9
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	9
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	10
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	N/A



SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	11
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	N/A No results as this is a protocol
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	N/A No results as this is a protocol
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	N/A
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	N/A No results as this is a protocol
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	N/A No results as this is a protocol
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	N/A No results as this is a protocol
Limitations	20	Discuss the limitations of the scoping review process.	N/A No results as this is a protocol
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	12 Conclusion on study protocol not the results.
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	12

JB1 = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med*. 2018;169:467–473. doi: [10.7326/M18-0850](https://doi.org/10.7326/M18-0850).



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