Abstract

Objective: Systematic reviews investigating associations between objective measures of the food environment and dietary behaviours or health outcomes have not established a consistent evidence base. This paper aims to synthesise qualitative evidence regarding the influence of local food environments on food and purchasing behaviours.

Design: A systematic review in the form of a qualitative thematic synthesis

Setting: Urban localities

Subjects: Adults

Results: Four analytic themes were identified from this review including community and consumer nutrition environments, other environmental factors and individual coping strategies for shopping and purchasing decisions. Availability, accessibility and affordability were consistently identified as key determinants of store choice and purchasing behaviours that often result in less healthy food choices within community nutrition environments. Food availability, quality and food store characteristics within consumer nutrition environments also greatly influenced in-store purchases. Individuals used a range of coping strategies in both the community and consumer nutrition environments to make optimal purchasing decisions, often within the context of financial constraints.

Conclusions: Findings from this review add depth and scope to quantitative literature and can guide ongoing theory, interventions, and policy development in food environment research. There is a need to investigate contextual influences within food environments as well as individual and household socioeconomic characteristics that contribute to the differing use and views towards local food environments. Greater emphasis on how individual and environmental factors interact in the food environment field will be key to developing stronger understanding of how environments can support and promote healthier food choices.
Introduction

The role of the built environment has received growing attention in relation to its contribution to diet and health outcomes such as obesity\(^1\). Food and nutrition environments have been transforming rapidly over the past few decades\(^2\), with many changes in access and availability of foods in line with shifting patterns of dietary intake\(^3\) and social demographics\(^4\). Decreased availability of and accessibility to supermarkets has been identified as a key barrier to consuming a healthy diet\(^5\) and a number of studies have reported on healthier food options being more expensive than less healthy foods\(^6\). In environments that are seemingly less supportive of healthy eating, it is often difficult to make nutritious food choices when reduced availability, accessibility and affordability challenge the ability to acquire healthier alternatives\(^7\).

The local food environment has usually been categorised and measured in terms of different types of food outlets including the supermarkets, corner stores, fast food outlets and restaurants available to individuals where they live\(^8\). Based on this work, Glanz and colleagues\(^9\) have developed a conceptual framework that identifies three types of environments including the community nutrition environment (types of stores, accessibility), the consumer (within-store) nutrition environment (availability of healthy options, price, nutrition information) and organisational nutrition environment (home, school or work). These environments are influenced by a combination of government and industry policies and the information environment (media and advertising), which work in combination with individual factors such as socio-demographics, psychosocial factors and the perceived nutrition environment, and ultimately help determine eating patterns and behaviour\(^9\).

Much of the existing quantitative literature has sought to establish a relationship between the food environment (particularly the community nutrition environment) and both dietary behaviours and/or weight status\(^2\; 10\). However results have been inconsistent and the role of the food environment on eating patterns is far from understood\(^9\). Whilst most evidence on the links between the food environment and dietary intake comes from quantitative studies, as demonstrated by a series of systematic reviews\(^2\; 3\; 10\; 11\; 12\; 13\), far less research has been undertaken in terms of understanding the food environment from a qualitative perspective.

There is no currently published systematic review of qualitative literature that has specifically looked at the local food environment and dietary behaviours. Much of the qualitative research has explored socio-ecological determinants of food choices and/or dietary behaviours of different population groups (children\(^8\; 14\), adolescents\(^15\; 16\) and socio-economically disadvantaged
populations\(^{(17; 18)}\) in a range of environments (home\(^{(8; 16)}\), school\(^{(19; 20)}\) or local community\(^{(13; 21)}\)). Although one qualitative systematic review has explored obesogenic dietary intake in young children\(^{(22)}\) and another has focused on determinants of fruit and vegetable consumption in children and adolescents\(^{(23)}\), neither solely considered environmental determinants or food and purchasing behaviours.

Given the difficulty of studies and systematic reviews of quantitative literature in establishing associations between objective measures of the food environment and dietary behaviours or health outcomes such as obesity, this review aims to investigate what the qualitative literature tell us about the influence of the local food environment on food and purchasing behaviours. Synthesising qualitative evidence will enable an in-depth exploration of food environments to provide greater understanding of possible explanations for contrary outcomes and assist to inform and generate new hypotheses in quantitative research and subsequently guide the design of public health policy, interventions and practice\(^{(24)}\).

**Methods**

This review adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement to ensure quality of methods and reporting\(^{(25)}\) and the PRISMA checklist is included as Supplementary Table A.

**Search methods**

Six electronic databases were searched using keyword searches of entire articles. The databases included Medline, Health Reference Centre, CINAHL Plus with full text, PsycINFO, PubMed and Australian and New Zealand Reference Centre. Terms were selected to define essential elements of the search including the environment and specifically the type of environment, food and dietary intake, qualitative research methods, as well as key food environment concepts. The list of search terms and lateral searching methods are provided in Supplementary Material.

**Eligibility criteria**

Articles were included if they incorporated a qualitative research method with the inclusion of participant comments or quotes; were a primary study published in a peer-reviewed academic journal between 2000 and 2015; and were written in English language. The inclusion of the 15-year time period was selected given the increasing contribution to the food environment literature during this time\(^{(13; 26)}\).
The current review was particularly interested in explicit references made to people’s food consumption and/or purchasing behaviours or related environmental determinants as a function of the local food environment, as supported by specific quotes from participants. Research focusing on dietary intake of specific micro- or macronutrients or particular health or nutrition conditions/disorders, as well as studies on dietary acculturation or food security outside the context of food environments and purchasing behaviours, were excluded.

Some criteria were further refined such as excluding articles based on their setting, specifically schools, workplaces and within-home environments due to the additional scope and diversity afforded by these other types of food environments. Additional eligibility criteria were defined during the study selection process including the decision to include articles sampling adults and/or children within urban/metropolitan areas, but only if reported from the perspective of an adult, as the primary purchaser of food. Rural localities, as defined by the paper in their original context, were excluded given the potential differences in food environments between rural and urban areas.

**Study selection**
Articles identified through database searches were imported into EndNote Version X7. Duplicate records, non-English language articles and non-journal articles were removed. One author (E.P.) reviewed titles, abstracts and identified articles required for full text evaluation. Inclusion or exclusion of full text articles was undertaken independently by three authors (E.P., D.G. & L.T.) and then determined by majority consensus upon group discussion. Additional articles were retrieved from reference lists of included articles. The PRISMA flow diagram is recommended to document the systematic review search and selection process(27) and its application to the current review can be seen in Figure 1.

**Quality assessment**
Although there is currently a lack of consensus regarding the best tool for undertaking quality assessment of qualitative research(28), the Critical Appraisal Skills Programme (CASP) tool for appraising qualitative research is one recognised appraisal tool and was subsequently used to undertake quality assessment of included studies for this review(29). The purpose of the quality assessment was not to exclude articles based on their quality but simply to assess their rigor, credibility and relevance(30). This assisted in gaining a depth of understanding of the articles included(31), particularly in terms of their strengths, weaknesses and overall contribution to the review(32).
**Data extraction and analysis**

Summary data of eligible studies were extracted including authors and year of publication; study location; study aim; sample characteristics and data collection methods.

Data analysis utilised the thematic synthesis process as detailed by Thomas and Harden\(^{(33)}\), which is a widely utilised approach to analysing and synthesising qualitative data within systematic reviews\(^{(31)}\). The three main stages of this method included inductive line-by-line coding of article findings; developing descriptive codes to translate concepts between studies and finally; developing analytic codes to transform findings beyond the context of the original studies to generate new meaning and understanding. All major sections of empirical findings focusing on the local food environment and food/purchasing behaviours or related environmental determinants were free coded (E.P.) for four articles and then cross checked (D.G.) for quality assurance and consensus. The remaining articles were subsequently coded in the same manner.

Descriptive themes were developed by grouping individual codes by topic or similar ideas. Codes were then reorganised into a hierarchal structure under themes, allowing individual codes to sit under multiple descriptive themes or left in free code form. Descriptive themes and codes were iteratively reorganised and refined with similar or overlapping codes and themes being merged together. All authors participated in ongoing critical discussion regarding refinement of codes and themes.

Analytic themes emerged through an iterative inductive and deductive approach. Firstly, the relationships between descriptive themes were examined and then applied to answer the review question. The latter evolved by conceptualising the relationship between the food environment and dietary intake, as presented through initial coding and generation of descriptive themes. Similarities emerged with Glanz and colleague’s model of Nutrition Environments\(^{(9)}\) and thus their framework was used deductively to structure the findings in the context of existing literature and current understanding of food environments. Final descriptive themes and codes became mutually exclusive under analytic themes.
Results

Summary of included studies
A total of 2,744 articles were identified through the search process, of which 30 met the inclusion criteria for this review (Figure 1). Included studies were published between 2001 and 2015 with 19 from the United States, seven from the United Kingdom and one each from Mexico, Canada, Australia and the Netherlands. Data collection methods included focus groups (n=14), interviews (n=12) and a combination of interviews and focus groups (n=4). Sixteen articles sampled participants specifically for characteristics of socio-economic position and seventeen articles sampled participants either solely or predominantly from ethnically diverse communities, 13 of which consisted of African American populations. A summary of the included studies can be seen in Table 1.

Quality assessment
The outcomes from the quality assessment are presented in the supplementary Table C. Only 4 of the 30 articles met the criteria for all domains of quality. All articles provided a clear statement of aims, qualitative methodology and research design, however, two lacked key details regarding their recruitment strategy, five did not provide information on ethical clearance and 12 did not consider the relationship between researchers and participants during research design or data collection. There was no mention or detail provided regarding data saturation as part of data analysis in 23 of the articles, seven did not consider implications of bias either during analysis or reporting and two articles failed to discuss the credibility of their research findings. Finally, three articles did not consider applicability or transferability of the research.

Key findings
Thematic synthesis results are presented under four key analytic themes including the community nutrition environment, the consumer nutrition environment, other environmental factors and individual coping strategies for shopping and purchasing decisions. A matrix of key themes identified across the included studies can be seen in Table 2. The analytic themes represent a blend of concepts that either directly or partially align with Glanz and colleague’s model of Nutrition Environments\(^{(2)}\) and provide a means of understanding the findings in terms of current food
environment literature*. However, the themes also highlight other novel and emergent ideas. For example, behaviours such as coping strategies are not represented within this particular framework.

COMMUNITY NUTRITION ENVIRONMENT

Availability
The comparative availability of healthy and unhealthy options in the food environment was identified as playing a key role in food purchasing decisions and was discussed by 16 articles in the review from predominantly lower income or minority populations in the Netherlands, Australia, United States and United Kingdom. Articles mentioned the proliferation of take away foods within communities (17; 34) and decreased or declining availability of produce, which was seen as one of the biggest influences on diet (35). Concern was raised regarding the availability of convenience or junk foods within stores (34), the proximity to fast food and thus the subsequent increased consumption of these foods (36; 37; 38; 39) and decreased consumption of fresh produce (40).

“every corner sells fast food ... [so it’s] hard not to buy it.” (Lucan, p705).

Articles mentioned green grocers (40) and other stores either closing down or moving out of the area due to lack of trade (41) or overwhelming competition (40). Reference was also made to the lack of larger, high quality supermarkets within neighbourhoods, forcing consumers to shop outside of their local area (42).

Culturally and linguistically diverse populations located in both the United States and United Kingdom referred to the difficulties in obtaining traditional foods due to limited availability (34). Consumers would often choose to frequent particular stores because of cultural availability and variety of ethnic foods (43), yet rejected stores that sold unfamiliar items or those catering for other ethnic groups (44).

One United States-based article identified the phenomenon of local food environments being both “raced” and “classed” with a clear segregation of food stores being a result of racism and oppression (45). Minority communities such as African American communities were often in areas

* The concept of affordability in this review has been discussed within the context of the broader food environment (price differences between rather than within food stores) and was therefore seen to align with the community nutrition environment instead of the consumer nutrition environment.
with little or no availability of healthy foods\(^{(45)}\). Subsequently it was identified that “white” areas often had better availability, as well as variety and quality of foods\(^{(46)}\), with good food stores generally perceived to be in better areas of town\(^{(45; 47)}\). Marked differences were seen in both the availability and quality of foods sold in predominantly African American areas\(^{(48)}\) or low-income communities, including populations from the Netherlands and Australia\(^{(17; 40)}\), compared to those in white and more privileged areas \(^{(45)}\) and thus food quality was also a function of store clientel\(^{(47)}\).

“Same price. Low quality…food is directed to the area.” (Kumar, p374).

Equity issues were also identified solely in United States populations through chain stores stocking different products depending on the neighbourhood\(^{(45)}\), thus potentially highlighting inequitable access to food choices\(^{(46)}\). Local food environments tended to mirror the social class of the community and consumers endeavoured to shop at stores congruent with their social status, clearly highlighting class differences in where people shop\(^{(44)}\).

**Accessibility**

Accessibility was identified as a key determinant of food purchasing behaviours in terms of where food stores were located as well as transport options that facilitate access and was discussed in 18 articles from the United States, United Kingdom and Australia and was particularly evident for lower socio-economic groups. A number of barriers to accessing local stores were identified\(^{(17; 45)}\), including having to rely on others for use of private vehicles\(^{(49; 50; 51; 52)}\) or only being able to frequent nearby convenience stores if access to private or public transport was not an option\(^{(41; 45; 46; 53)}\).

“I mean, you’re not fixing to find any foods or anything in the convenience store. It’s a horrible thing, you know, for those who don’t have it [transportation], because they are forced to go to one of those convenience stores…They [the stores] don’t have real food over there”. (Freedman, p388).

References were also made to the sporadic availability of jitneys (informal taxi service)\(^{(48)}\) at certain local stores, therefore limiting store choice for those reliant, primarily African American communities, on this form of public transport\(^{(47)}\).
Given the sub-optimal availability of items in local stores, good food stores were often seen as being far away\(^\text{45}\). Afforded the opportunity, preference was given to leaving the local community and traveling further for food to obtain better quality and variety of foods as well as to save money\(^\text{42; 49}\) and this was particularly due to dissatisfaction with neighbourhood stores within United States-based localities\(^\text{48}\).

Walkability was a key priority for low income and minority population groups within the United Kingdom and United States populations without access to cars\(^\text{41; 46; 48; 51; 52}\). Articles also made reference to the influence of transportation mode on shopping frequency\(^\text{51; 52}\). Access to private motor vehicles usually meant less frequent shopping trips compared to more frequent trips made by those who walked or used public transport\(^\text{48}\), the latter of which also needed to factor in the cost of each trip\(^\text{41; 42}\). Public transport was also seen as impractical and difficult when required to transport heavy groceries home, especially fruit and vegetables, or to shop with young children\(^\text{41; 49; 50; 52}\). Thus location of and access to stores was a key determinant to buying and consuming fresh produce\(^\text{35; 50}\).

**Affordability**

Twelve primarily United States-based articles referred to distinct differences in price depending on the type of store. Corner stores\(^\text{41; 42; 48; 52; 53; 54}\) and meat markets\(^\text{46; 52}\) were usually said to be much more expensive than supermarkets, chain superstores\(^\text{44}\) or public markets\(^\text{55}\).

> “Milk is normally 79 pence for the big jugs. I just go down to the [store] and get it there because up here it’s [1 pound] …” (Piacentini, p150).

Consumers often referred to local food stores as over-priced\(^\text{43; 45; 46; 52; 53}\) and taking advantage of local residents\(^\text{46; 53}\). Specific reference was also made to the same items in different stores being more expensive\(^\text{42}\).

**CONSUMER NUTRITION ENVIRONMENT**

**In-store food availability**

In-store availability of fruit, vegetables and meat was reported as a key driver of food store choice\(^\text{41; 56}\) and was discussed in 15 articles from the Netherlands, United States and United Kingdom. Contrary to this, however, the availability of fresh produce was often referred to as unreliable and sporadic\(^\text{36; 45}\), especially in lower socio-economic areas. Corner stores and mini-markets were described as having less variety\(^\text{48; 53}\) and fewer (if any) healthy items or
alternatives\(^{(42;\ 44;\ 45;\ 46;\ 57)}\) than supermarkets\(^{(44;\ 45)}\). Local food stores tended to be stocked with unhealthy snack foods, cold drinks, cigarettes and beer\(^{(45)}\). Consequently this limited the variety of healthy food people had access to, particularly if they were reliant on corner stores for their food purchasing\(^{(47)}\).

“Far as fruit, there ain’t no fruit there [at the local convenience store]. I don’t remember seeing no kind of, you know, like oranges, bananas, apples, tangerines, peaches; I don’t see none of that down there. They ain’t got no fruits or nothing.” (Freedman, p390).

**In-store food quality**

Nine articles predominantly based in the United States, reported on customer concern regarding poor quality and safety of foods they could select from\(^{(41;\ 42;\ 48;\ 53)}\). Consumers mentioned displays of withering fruit and vegetables\(^{(43;\ 45;\ 46;\ 53)}\), canned goods and meats close to expiration\(^{(43;\ 47)}\) and spoiled or rotting meats\(^{(42;\ 46;\ 48)}\). Consumers discussed closely inspecting food prior to purchasing\(^{(43)}\) but also refusing to purchase fresh produce because of quality\(^{(58)}\), opting to buy canned produce instead, or purchasing fresh foods from outside the community\(^{(45;\ 46)}\). Reference was also made to deceptive sales practices utilised by stores to disguise spoiled produce\(^{(42)}\), resulting in distrust of local food stores.

“I just take for granted when I go to the store that it’s going to be fresh, but not around here; here sometimes you have to blow the dust off and check the date.” (Webber, p300).

**Food store characteristics or features**

Eight articles (seven from the United States and one from the United Kingdom) identified specific features or characteristics of food stores that play a role in influencing a person’s decision to frequent a particular store and make food purchases, including in-store promotions and product placement, as well as cleanliness and customer service. Such factors were mostly referred to in minority or lower socio-economic communities.

**In-store promotions and product placement**

In-store marketing, promotions and sales were discussed in relation to their influence on promoting purchasing decisions. These promotions were helpful for some who searched for items on sale\(^{(54)}\), while others perceived them to be exploitive and complicated\(^{(43)}\). Specific reference was made to the heavy promotion of junk foods in terms of price, as well as their placement within the store to encourage unhealthy purchases\(^{(59)}\). Consumers often made comment on displays put at store
entrances to catch their attention, “wall of values” and junk foods placed directly in front of healthy items such as fresh produce\(^{57}\). It was also noted that promotions and sales rarely applied to fresh produce\(^{43}\).

“It’s all thee buy-one-get-one-free on big bars of chocolate and big cakes ... but you never see buy-one-get-one-free by big bags of fruit.” (Lawrence, p1008).

Further to marketing and sales often favouring unhealthy foods, a couple of articles discussed the fact that healthier food items were not easily identifiable within store. They mentioned that healthy items were available but difficult to identify\(^{58}\) due to their placement and marketing\(^{46}\). Although some stores had separate sections for their healthy products, there was a general lack of shelf labelling to identify such items, with labels usually used only to highlight product prices and specials\(^{59}\).

**Cleanliness**

Store cleanliness was reported as an important determinant of store choice\(^{56}\). Clean stores were associated with perceptions of fresh and wholesome food\(^{43}\) with customers also associating poor upkeep with poor quality food\(^{46}\). Consumers discussed refusing to shop in a particular store if the cleanliness did not meet expectations\(^{45; 46}\).

“I walked in the store and it was just like nasty... we’re not fixing to get nothing from up out of here because they’ve got roaches and the floor is filthy dirty. I’m gone.” (Zenk p285).

**Customer service**

Poor attitudes and a lack of courtesy were identified as barriers to food purchasing and patronising certain stores\(^{42; 46}\). Several articles discussed what patrons look for in terms of good customer service such as staff that are adequately trained\(^{43; 44}\), are helpful to customers in finding particular items\(^{44; 50}\) and reasonable management who a receptive to feedback and handling complaints\(^{43}\). Customers looked for welcoming environments where they were greeted upon arrival\(^{56}\), made to feel accepted, treated with respect and on a first name basis with management or employees. Customers expected a degree of service that was in line with the demeanour of the particular store, however customers reported differing attitudes depending on the store they shopped in\(^{43}\).

**OTHER ENVIRONMENTAL FACTORS**
Influence of media and advertising

Four articles (two from the United States and one each from Canada and the United Kingdom) discussed the role of television-based media or outdoor advertising of fast food as influences on people’s food choices. One article attributed the choice of out of home eating establishment to advertising and marketing techniques\(^{(37)}\). Media was identified as an important influence on diet\(^{(35)}\) and children’s pester power and request for unhealthy foods whilst grocery shopping was attributed to particular products being seen on television\(^{(59)}\).

Other environmental factors

Factors broader than the food environment were also identified as having an influence on people’s choice of shopping location such as neighbourhood characteristics and safety concerns, which were identified in four United States-based articles. People spoke of being hassled by loiterers in front of food stores\(^{(46)}\), nearby drug sales or alcohol related violence\(^{(44)}\) as well as general safety in grocery store car parks\(^{(56)}\). Personal safety was identified as a determinant of shopping location\(^{(48)}\) with people choosing to avoid stores where they had heard of violent incidents occurring\(^{(56)}\).

“I don’t really like going certain places...cause I just don’t feel safe...” (Zenk, p286).

INDIVIDUAL COPING STRATEGIES FOR SHOPPING AND PURCHASING DECISIONS

Coping strategies within the Community Nutrition Environment

Sixteen articles from the United States, United Kingdom and Mexico identified the resourcefulness of people in their use of food stores within the food environment to suit their needs and requirements. Thus consumers were seen to actively adapt to their local food environment\(^{(43; 44)}\). Such strategies included shopping at multiple stores or locations\(^{(43; 46; 57; 60)}\) and also frequenting certain stores for specific purchases\(^{(43; 44; 46)}\) due to both cost and preference considerations. For example, purchases made at corner stores were limited to just essential items because of their inflated prices\(^{(41; 44; 52; 54; 60)}\). People also chose to shop at stores that were most convenient in undertaking their errands or fit with their routine\(^{(49)}\). Others prioritized shopping convenience over all other factors\(^{(43; 59)}\) in an endeavour to frequent stores that were conveniently located\(^{(55)}\), including shopping at the one location\(^{(43; 55)}\).

Coping strategies within the Consumer Nutrition Environment

A number of individual approaches to food shopping and purchasing within food stores was discussed in 24 of the included articles from all study localities, with cost frequently referred to as
the primary factor that dominated purchasing priorities, particularly for people of lower socio-economic status (39; 41; 42). People sought to minimise purchasing costs at the expense of all other purchasing considerations. Cost was deemed to be a more important consideration than the nutritional quality of foods (36) and also dictated unhealthy food purchases regardless of people’s preferences for healthier items (58):

“I know exactly what we should be eating and what would be healthy and all that and I’m really frustrated that we can’t eat that way...because there just ain’t enough money...”

(Wiig Dammann, p246).

Cost was deemed a barrier to purchasing healthy items such as fruit and vegetables (17; 35; 50; 56; 58; 61) in the United States, United Kingdom and Australia, with healthy foods perceived as being more expensive (42) and unhealthy items seen as more cost effective alternatives (58; 61). However, others found it more cost effective to buy fresh and seasonal foods rather than pre-packaged and pre-made items (59) or thought it was possible to eat healthy (51) if junk food purchases were reduced (38; 52).

Regardless of study locality, articles discussed an array of in-store purchasing behaviours that people, predominantly of lower socio-economic status, applied to minimise the cost of their shopping. Techniques included searching for items on sale (43; 49; 51; 54; 57; 58); buying items in bulk (49; 54; 60); comparing prices (41; 58); buying store brands (51; 54); settling for cheaper cuts of meat (51; 60); trying to get the best value for money (41; 58; 61); and refusing to buy certain items if they were considered too expensive (43).

Consumers discussed the importance of ensuring an adequate quantity of food for their family rather than quality food within their budget constraints (51; 52; 56; 58). One article from the United Kingdom also discussed various in-store shopping styles routinely applied within the store environment, including ‘restricted and budgeted’ shoppers, characterised by very controlled and planned purchases, often within the confines of price considerations (62).

For those of higher socio-economic status from United States, Australian and Mexican populations, cost rarely drove purchasing decisions (39), which were instead prioritised by taste and food quality preferences, the convenience of accessing foods as well as the health benefits of their food choices (17; 55).

Discussion
This review sought to synthesise qualitative evidence regarding the influence of the local food environment on food and purchasing behaviours. Availability, accessibility and affordability were consistently identified as key determinants of store choice and purchasing behaviours that often resulted in less healthy food choices within community nutrition environments. Food availability and quality within stores, and food store characteristics within consumer nutrition environments also greatly influenced in-store purchases. Media and advertising as well as other environmental characteristics each influenced food purchasing behaviours. People used a range of individual coping strategies in both the community and consumer nutrition environments to make optimal purchasing decisions, often within the context of financial constraints.

Findings also identified distinct differences in themes that emerged from the articles depending on whether they were based within United States populations or elsewhere. It appears the key themes of affordability (within the community nutrition environment) and in-store food quality and food store characteristics or features (within the consumer nutrition environment) were more often discussed in articles from the United States. In addition to this, race-based factors were solely discussed in United States-based articles. This potentially highlights between-country variations and thus contextual differences between food and social environments. For example, whilst evidence tends to suggest the presence of cost and access disparities for low income and minority communities in the United States, this is not necessarily consistent in other countries such as the United Kingdom. Differences in the actual food environments and people’s use of these between countries can make research undertaken in different contexts difficult to compare.

All but three articles had a specific focus on or discussed socioeconomic factors both at the community or individual level and their influence on food acquisition. It was not surprising therefore that cost of food was continually identified as the most important influence. This finding reinforces the importance of socioeconomic status and its contribution to disparities in food access, availability and cost and is generally supported within the available literature.

Quality assessment outcomes of included articles was concerning for aspects of research design and reporting but were not formally used to separate study results. Poorer quality articles were included, given their novelty and potential to still provide a rich and insightful contribution to the findings generated from this review. Regardless, there is a need to ensure high quality and rigorous processes and reporting whilst undertaking future qualitative research endeavours.
Although the current review was focused on the role of environmental determinants on food behaviours, the synthesis identified challenges in seeking to explore environmental factors in isolation from other social-ecological determinants of behaviour. Indeed, consideration of the inequalities and challenges experienced by lower socioeconomic and minority populations in accessing and making purchasing decisions within the food environment was key to consolidating findings across studies. Food and purchasing decisions are influenced by more than just the environment and thus the importance of intra- and interpersonal, social and cultural factors that influence behavior, must not be underestimated. Policy and behavioural change interventions should still embrace a socioecological approach beyond exploration of the environmental determinants presented in the current review.

Synthesis also highlighted distinct individual approaches to food shopping and purchasing within the community and consumer nutrition environments, primarily due to socioeconomic (financial) constraints. These approaches demonstrate the dynamic interplay between structural barriers that exist within the environment and the capacity of human agency when faced with limited community, social and financial resources, which cannot be overlooked in terms of the influence of solely environment on food behaviours. An individual’s agency is also underpinned by their motivation, ability and opportunity in undertaking certain behaviours, as seen by the array of coping mechanisms applied and demonstrated through people’s resourcefulness and adaptation to their food environments to meet their purchasing requirements. However agency is limited, particularly if structural constraints are too difficult to overcome.

The current review is not without its limitations. The systematic search process included empirical literature published in peer-reviewed journals and thus did not incorporate grey literature, government reports or forthcoming research, potentially missing other important contributions in the field. Furthermore, the scope of the review was limited to only including community and consumer food environments and therefore excluded research in organisational environments including schools, childcare centres, workplaces and the home environment due to the additional breadth and diversity of outcomes that would result from their inclusion. A vast majority of the included articles were from research undertaken in the United States and given the variability within these food environments and also compared to other countries, this could impact the applicability of findings and result in an inability to make generalisations to different populations. Finally, this review did not incorporate synthesised results regarding food security issues and the use of food assistance programs, and although mentioned in a number of articles
(n=9), it was deemed this topic could not be adequately addressed within the chosen scope of this review, given its breath, scope and complexity.

To our knowledge, this is the first systematic review to synthesise qualitative research on the local food environment and food consumption and purchasing behaviours. The findings from this synthesis will assist in providing a deeper and more comprehensive understanding of environmental determinants within community and consumer nutrition environments that are consistent with findings from quantitative research in the field\textsuperscript{(64–66)}. Moreover, they may help to explain the inconsistent quantitative associations found between the food environment and dietary behaviours by emphasising the complexity and diversity of contextual factors that exist within these environments.

Future research should focus on integrating findings from qualitative and quantitative food environment syntheses in order to generate both new and refined hypotheses for ongoing research into the associations between aspects of the food environment and health/diet related behaviors. Given the significant focus of included articles on socioeconomic determinants, future research could explore how different people use the same food environment, that is, what characteristics result in individuals using food environments in different ways. This synthesis provides a summation of qualitative literature that could be used to guide policy formation and continue to develop tailored and multi-component interventions within food environment research.

**Conclusion**

Environmental factors continue to be identified as pertinent determinants of food store selection and purchasing behaviour. Regardless of an individual’s ability to cope with less than optimal environments through the power of human agency, the environment needs to be modified and improved in order to maximise health-related outcomes. There is a need to investigate contextual influences within food environments as well as individual and household socioeconomic characteristics that contribute to the differing use and views towards local food environments. Greater emphasis on how individual and environmental factors interact in the food environment field will be key to developing stronger understanding of how environments can support and promote healthier food choices.
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<td>Canada</td>
<td>N=39 (34 female, 5 male)</td>
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Zachary 2013 United States N=46 (40 female, 6 male) Predominantly African American ethnicity Interviews (N=32) and Focus Groups (N=3) In-store food purchasing decisions

Zenk 2011 United States N=30 females Low SES; African American ethnicity Interviews (N=30) Food acquisition behaviours and their environmental influences

SES=Socioeconomic status

Note: Information in the above table represents information/participants that met the inclusion criteria. For example, if a study used a mixed methods research design, details are not provided on the number of survey participants in the study or if the study incorporated both rural and metropolitan areas, details on the rural participants (if made explicit) have not been provided.

* Number of rural participants can’t explicitly be identified and excluded from the sample
† Number of females and males not identified
Table 2: Summary of analytic and key descriptive themes across studies

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* Socio-economic factors not considered or discussed within articles (n=3)
† Racial or culturally diverse factors discussed within articles and pertaining to key themes (n=8)
References


46. Zenk SN, Odoms-Young AM, Dallas C et al. (2011) "You have to hunt for the fruits, the vegetables": environmental barriers and adaptive strategies to acquire food in a low-income African American neighborhood. *Health Educ Behav* 38, 282-292.
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