

Factors perceived to influence healthy eating: a systematic review and meta-ethnographic synthesis of the literature

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Context: Dietary risks are leading contributors to global morbidity and mortality and disproportionately burden individuals of lower socioeconomic positions.

Objective: The aim of this review is to understand, holistically, what factors are perceived to influence healthy eating and to determine whether perceived factors differ when comparing the general population with lower socioeconomic sub-groups.

Data Sources: Four academic databases (MEDLINE, CINAHL, PsycINFO, Cochrane Library) and 3 gray literature databases were searched systematically, along with reference lists. **Study Selection:** Studies were included if they were qualitative and were conducted with community-dwelling adults in high-income countries and if they focused specifically on healthy eating. Eligibility was determined through author consensus. **Data Extraction:** Thirty-nine eligible studies (of 11 641 records screened) were identified. Study characteristics were extracted using a standard template, and quality appraisal was conducted using the Critical Appraisal Skills Program tool. Data synthesis was conducted using meta-ethnography, with themes categorized according to the socioecological model.

Results: Factors across the individual, social, lived, and food environments were perceived to influence healthy eating. Meta-ethnography revealed that multiple environmental and social factors were frequently reported as barriers to healthy eating. While factors were largely generalizable, diet affordability and the lower availability of stores offering healthy food appeared to be more salient barriers for lower socioeconomic groups. **Conclusions:** Actions to improve population diets should mitigate the barriers to healthy eating to create environments that support healthy eating across the socioeconomic gradient.

Systematic Review Registration: PROSPERO registration number CRD42017065243.

INTRODUCTION

Unhealthy diets are a significant risk factor for obesity and many noncommunicable diseases. A poor diet is now considered a leading risk factor for disease and

death globally.¹ While there has been some progress in developing and implementing policies and interventions to improve population diets and reduce obesity and noncommunicable diseases, the prevalence of these diseases in high-income countries remains high. In

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high-income countries, it is also well established that individuals with a lower socioeconomic position (SEP) share a disproportionately higher burden of obesity and consume lower-quality diets compared with their counterparts of higher SEP.^{2,3} Reducing both the prevalence of obesity and the inequity in excess weight gain requires food policies enacted by the highest level of governance.⁴ Equitable policies should address the multilevel factors that drive unhealthy diets, or the “causes of the causes” (including the social determinants of health), as well as how these factors vary across socioeconomic groups.^{4,5}

To date, evidence reviews that include both quantitative and qualitative studies have identified multiple factors that influence food choice and healthy eating among adults.^{6–10} Eating and shopping habits, time constraints, social environments, food price, food availability, and sensory characteristics of food have been recognized as important factors by most of these reviews.^{6–10} However, the findings of these reviews are varied and are reported inconsistently, which may be explained, in part, by the limitations associated with synthesizing both qualitative and quantitative studies. In fact, current understanding of the interplay and relative importance of these factors across the socioecological levels is limited for both the general population and different socioeconomic groups.⁸

Qualitative research offers a flexible approach to gain new insights and a holistic understanding of a complex phenomenon (ie, factors influencing healthy eating). This is achieved by comparing and contrasting the insider perspectives and multiple realities experienced by everyday citizens.¹¹ An in-depth qualitative understanding of how individuals currently experience healthy eating is essential for developing citizen-centered food policies that are tailored, feasible, acceptable, and ultimately effective.¹² Thus far, only one qualitative systematic synthesis on the determinants of healthy eating has been conducted.¹³ This synthesis focused on children and adolescent populations and only described (as opposed to comparing, contrasting, and interpreting) the findings of the included studies. Additional interpretive research is required to identify findings that are generalizable to the broader population. To date, there has been no interpretive synthesis of the qualitative literature to understand the factors that influence healthy eating as perceived by adults. As far as could be determined, no studies have conducted an in-depth comparison of the factors that influence healthy eating across different socioeconomic contexts. Further investigation is warranted to identify leverage points and strengthen the evidence base for obesity prevention policies that can promote healthy eating across the socioeconomic gradient.

The purpose of this research was to explore the factors perceived to influence healthy eating in adults and to determine whether these factors differ when comparing the general population with population subgroups of lower SEP.

METHODS

This systematic literature review was registered with PROSPERO (International Prospective Register of Systematic Reviews; no. CRD42017065243) and reported according to the MOOSE (Meta-analysis of Observational Studies in Epidemiology) guidelines (see [Appendix S1](#) in the [Supporting Information online](#)).¹⁴

Search strategy

[Figure 1](#) summarizes the process of article identification and inclusion. A search was conducted in March 2017 across 4 academic databases (MEDLINE Complete, CINAHL [Cumulative Index to Nursing and Allied Health Literature] PsycINFO, and Cochrane Library). The search strategy was developed on the basis of key terms included in articles retrieved from a scoping search and encompassed 5 key search concepts: “adults,” “high-income countries,” “healthy eating,” “qualitative research,” and “factors” (see [Table S1](#) in the [Supporting Information online](#)). These concepts related to the population, exposure, and outcomes of interest. The population/exposure/outcomes of interest format is a modified version of the PICO (Population, Intervention, Comparator, Outcome) structure, considered appropriate for developing search strategies for qualitative reviews.¹⁵ This search was limited to data obtained in the last decade (2007–2017) to reflect contemporary factors perceived to influence healthy eating. English language and human participant limits were also applied. Additional studies were sought through gray literature searches in the System for Information on Gray Literature and the World Health Organization library database (WHOLIS) and by screening the first 300 references of Google Scholar.¹⁶ Backward and forward reference list searches of the included articles and relevant reviews were also conducted. While qualitative research is largely concerned with theoretical saturation (attained by the current synthesis), a systematic search strategy was employed to identify all the available literature to allow for the ongoing exploration of contextual differences between each included study.

Study eligibility and selection

Studies were included if they were conducted with community-dwelling citizens of high-income (as per

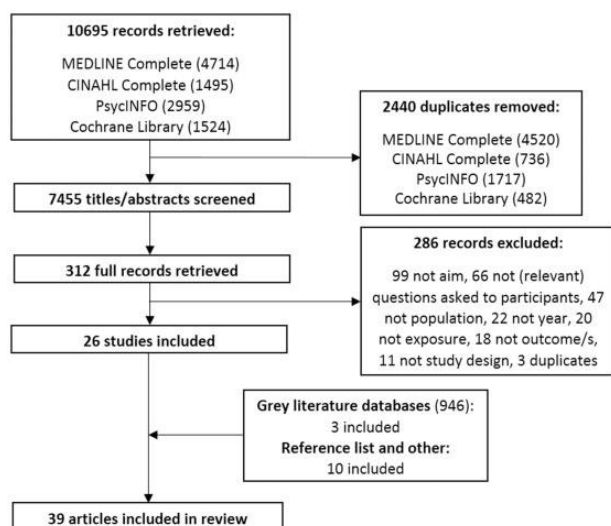


Figure 1 Flow diagram of literature search process.

the World Bank definition¹⁷), member countries of the Organization for Economic Co-operation and Development.¹⁸ This review focused on adults (18 years or older), as it was assumed they have the capacity to directly make and report on their own dietary choices. Studies were excluded if participants reported findings on behalf of another individual's life experiences (eg, healthcare professionals providing secondary information on behalf of community members). Eligible studies were also required to have stated a major aim relating to healthy eating (defined as consuming core food groups recommended by population guidelines), which precluded studies exploring factors that influence healthy lifestyles or the consumption of specialized or therapeutic diets (eg, gluten-free diet for celiac disease). Populations with preexisting disease states were also excluded. Qualitative primary research (interviews, focus groups, and open-ended surveys) and qualitative components of mixed-methods studies were included to reflect in-depth, lived experiences with healthy eating. Both published and unpublished studies (ie, theses) were included. Quantitative research, reviews, and meta-analyses, along with studies that evaluated participant perspectives on healthy eating post intervention, were excluded. Studies were only included if the outcomes were factors that directly influenced healthy eating and were excluded if the outcomes indirectly related to healthy eating (ie, healthy lifestyles, weight maintenance more broadly).

One author independently removed the duplicate records and independently screened the title and abstracts to determine the eligibility of the retrieved records. Of these, 312 full texts were screened, and eligibility was independently determined by 2 coauthors (with > 95% agreement). Discrepancies were resolved

through discussion between the 2 coauthors; a third author was consulted when consensus was not achieved.

Data collection and quality appraisal

The following key information was extracted from eligible studies into a standard Microsoft Excel template: aim(s), country, setting, population characteristics (eg, gender), SEP (any indicator), sample size, and outcomes (factors identified to influence healthy eating). One author was contacted to obtain additional information. The Critical Appraisal Skills Program tool was used to assess the quality of the included studies on the basis of 10 reporting areas relevant to qualitative research.¹⁹ This tool was selected on the basis of its recent inclusion in systematic reviews within the area of health and to promote consistency in the co-reviewing process.^{20,21} Quality appraisal was undertaken independently by the primary investigator and one other member of the review team. While there was disagreement for almost 30% of the quality criteria, discrepancies were resolved through discussion. Quality appraisal was conducted not to exclude studies but rather to assess the reporting quality and to hypothesize about the methodological implications of this body of evidence.

Data synthesis and analysis

Results were synthesized according to the principles of meta-ethnography as espoused by Noblit and Hare.²² Compared with thematic analysis, which reduces data to descriptive themes, meta-ethnography is a highly interpretive technique for synthesizing qualitative research. It places studies side by side to identify how key themes can be translated between studies while considering contextual similarities and differences. Meta-ethnography is based on social explanation theory, which maintains that social explanation is comparative.^{22,23} To enable the derivation of a higher-order, interpretive model, which explains why people (do or do not) eat healthfully across different socioeconomic contexts, meta-ethnography was deemed appropriate for synthesizing the findings of this systematic review.

Meta-ethnography was piloted by 2 authors on a subset of 5 randomly selected studies. Each author independently identified key themes from each of the individual studies as well as the influence of those themes (ie, barrier, facilitator, or neutral influence) on healthy eating to standardize this process. Key themes represented any text that reflected factors influencing healthy eating and were extracted from the results sections of eligible studies to bring together the views of participants. For one study that involved participants listing an extensive number of factors, only those factors that

the authors noted as salient (frequently reported) were extracted.²⁴ Study themes were extracted into Microsoft Excel 2016 to enable their juxtaposition. To explore the relationships between studies, themes were compared, and similarities and differences were noted. During the pilot review, the 2 authors discussed their comparisons of the themes and agreed that the themes were unambiguously reiterated across the examined studies. These initial assumptions (that factors are experienced similarly across contexts) enabled the subsequent translation of themes between studies, a process that actively seeks to identify how themes exist in different contexts.²²

The final steps of meta-ethnography involve synthesizing all extracted themes and translations from the included studies. The identified themes ultimately complemented one another to build a bigger picture and a holistic explanation of influences on healthy eating (ie, a “line of argument” synthesis). Overarching themes were identified and categorized using concepts from the socioecological model of health.²⁵ The socioecological model was deemed appropriate for this synthesis because it recognizes how individual health risks are influenced by factors across many interrelated levels (individual, social, organizational, community, and political).²⁵ The outer layer of this model, however, was subdivided and tailored to represent different factors within the food and lived environments. Two authors (C.Z., K.B.) independently conducted this step and discussed differences in interpretations until agreement was achieved. The results represent an in-depth understanding of the factors perceived to influence healthy eating.

Although meta-ethnographies are typically arranged in chronological order to account for contextual changes over time, the present analysis controlled for such changes by limiting the search criteria to the last decade. To enable a richer interpretation of the relationships between the studies, studies were categorized by type of population (general population or low-SEP population) and by setting (community, university, or workplace), 2 contextual factors recognized as important influences on healthy eating.^{3,26} As such, meta-ethnography could first reveal factors that influence healthy eating across the general population and then proceed to identify whether those factors differed when an in-depth exploration of studies was conducted only among subgroups with a low SEP.

RESULTS

Study characteristics

Thirty-nine studies were eligible for inclusion in this systematic review. Table 1^{24,27–64} outlines the

characteristics of the included studies, which were predominantly conducted in the United States (56%), Europe (21%), Australia (13%), and Canada (10%) and represented a total of 1746 participants. The study populations were largely diverse and included varied age groups (18–70+ years), predominantly females (72% of studies > 50% female), and ethnic minorities (majority of participants in 28% of studies). One-third of the studies (n = 13) were conducted exclusively among participants of low SEP. Low SEP was measured heterogeneously across studies and included self-reported income, highest level of educational attainment, occupation, level of neighborhood socioeconomic disadvantage, and receipt of welfare or community benefits/programs tailored to low-income groups. Only one study compared factors between high and low SEP groups.³⁰ Focus groups predominated the methods of qualitative data collection used (72%), while interviews were employed to a lesser extent.

Quality appraisal

Consensus was achieved between 2 researchers for all criteria of the Critical Appraisal Skills Program tool for each cross-checked study. Reporting rigor was unclear or insufficient in multiple studies, particularly in relation to reflexivity (90%), recruitment strategy (41%), and data collection (41%) (see Table S2 in the Supporting Information online).

Data synthesis and analysis

The interrelationship of key themes that emerged from the present meta-ethnography is presented in Figure 2²⁵ (for the detailed themes from all studies, see Tables S3 and S4 in the Supporting Information online). This figure also highlights how the identified themes (ie, factors influencing healthy eating) were found to be applicable to both general and low socioeconomic contexts. The generalizability of these factors was supported by the attainment of thematic saturation, whereby the themes were consistently reported by studies in different demographic groups. The following sections will summarize each factor that influences healthy eating within the different levels of the socioecological model.²⁵ An exemplary quote will be used to convey how participants described each factor (Table 2^{29,31,32,43,51,53–56,63}).

INDIVIDUAL LEVEL

Knowledge and skills

Food and nutrition knowledge and skills, if participants thought them to be present, were largely believed to

Table 1 Characteristics of included studies and participants

Reference	Country (rurality, if specified)	Population characteristics: age (range or mean \pm SD); percent female; ethnicity; other	Type of data collection; sample size
General population			
Community setting			
Dumbrell & Mathai (2008) ²⁷	Australia	18–40 y; 0% F; 18–25 y (80% born in Australia, 84% students), and 26–40 y (82% born in Australia, 100% skilled professionals)	7 focus groups; n = 36
Doldren & Webb (2013) ²⁸	USA	18–45 y; 100% F; African American	4 focus groups; n = 40
Godinho et al (2013) ²⁹	Portugal	20–66 y; 60% F	8 focus groups; n = 45
Bukman et al (2014) ³⁰	Netherlands	39–75 y; gender NR	9 focus groups; n = 56
Ashton et al (2015) ³¹	Australia	18–25 y; 0% F; young men	10 focus groups; n = 61
Gamboa (2015) ³²	USA	18–45 y; 71% F; Hispanic	4 focus groups; n = 24
Yeh et al (2008) ³³	USA (rural and urban)	18–50+y; gender NR; multiethnic groups (white, African American, Hispanic)	12 focus groups (4 groups for each ethnicity); n = 147
Mead et al (2010) ³⁴	Canada (remote)	Age NR; 72% F; Inuit; 2 communities (13% and 31% unemployment rates, median income Can\$60 000 and Can\$44 000)	Semistructured interviews; n = 43
Caperchione et al (2012) ³⁵	Australia (regional)	43.8 y \pm 10.8 y; 0% F; middle-aged men	6 focus groups; n = 30
Seguin et al (2014) ³⁶	USA (rural)	30–84 y (58.3 \pm 14); 100% F	7 focus groups; n = 95
Mabry et al (2016) ³⁷	USA (rural)	26–46 y; 100% F; women of childbearing age	1 PhotoVoice focus group; n = 10
White et al (2017) ³⁸	USA (rural and urban)	\geq 50 y; 80% F; African American; 43% retired, 49% employed; 49% US\$21 000–\$39 000 income	7 focus groups; n = 70
University/educational setting			
Walsh et al (2009) ³⁹	USA	20.3 y \pm 1.7 y; 0% F; 94% white; young men	6 interviews; n = 47
Garcia et al (2010) ⁴⁰	Canada	18–50 y; 82% F; students	3 PhotoVoice focus groups; n = 28
Herbert et al (2010) ⁴¹	England	18–24 y; 45% F; students	4 focus groups; n = 40
LaCaille et al (2011) ⁴²	USA	18–22 y; 65% F; 94% white, 6% other; students	6 focus groups; n = 49
Quintiliani et al (2012) ⁴³	USA	21–64 y; 43% F; 64% non-Hispanic white, 14% non-Hispanic black, 7% Hispanic, 14% other; nontraditional students (ie, mature age)	Semistructured interviews; n = 14
Allom & Mullan (2014) ⁴⁴	Australia	19.5 y \pm 2.3 y; 71% F; 69% Australian, 31% Asian; students	7 focus groups; n = 35
Kapetanaki et al (2014) ⁴⁵	Greece	18–23 y; 58% F; students	9 focus groups; n = 59
Martinez et al (2016) ⁴⁶	USA (Hawaii)	25.4 y \pm 7.9 y; 65% F; 32.5% Asian American, 30% mixed ethnicity, 20% white, 17.5% other; students	6 focus groups; n = 38
Workplace setting			
Mulvaney-Day & Womack (2012) ⁴⁷	USA	18–25 y; 50% F; non-Latino white; students, fast food restaurant employees	Interviews; n = 14
Leslie et al (2013) ⁴⁸	USA (Hawaii)	20–69 y; 77% F; white-collar workers	4 focus groups; n = 18
Pridgeon & Whitehead (2013) ⁴⁹	England	16–25 y (4%), 26–65 y (96%); 57% F; white, British; different employment groups	Interviews; n = 23
Mazzola et al (2017) ⁵⁰	USA	41.5 y \pm 12.5 y; 77% F; university employees and alumni	Open-ended surveys; n = 93
Torquati et al (2016) ⁵¹	Australia (urban)	25–59 y; 82% F; nurses	4 focus groups; n = 17
Power et al (2017) ⁵²	Scotland	\leq 30–50 y; gender NR; nurses	Semistructured interviews; n = 16
Low-socioeconomic population			
Community setting			
Hampson et al (2009) ⁵³	USA	18–50+y; 100% F; 74% non-Hispanic white, 12% Native American, 8% Hispanic, 4% black, 2% Asian; low-income women	7 focus groups; n = 74
Kaiser & Baumann (2010) ⁵⁴	USA	18–70+y; 55% F; 70% Latino, 30% non-Latino	4 focus groups; n = 20
Lucan et al (2010) ²⁴	USA	18–35+y; 50% F; African American	Structured interviews; n = 40

(continued)

Table 1 Continued

Reference	Country (rurality, if specified)	Population characteristics: age (range or mean \pm SD); percent female; ethnicity; other	Type of data collection; sample size
Whiting et al (2010) ⁵⁵	Canada	18–70+y; 86% F; women with children, older adults, immigrants	12 focus groups; n = 73
Barton et al (2011) ⁵⁶	Ireland (rural)	18–74 y; 95% F; mixed community groups	7 focus groups; n = 42
Sully (2011) ⁵⁷	England	31–92 y; 91% F; parents and older adults	4 focus groups; n = 32
Tsang et al (2011) ⁵⁸	Canada	18–69 y; 89% F; residents of food-insecure area (6.7% unemployment, 7% low-income); recruited from food-support organizations	Semistructured interviews; n = 35
Davis et al (2012) ⁵⁹	USA	21.7 \pm 5.59 y; 89% F; 56% African American, 33% Hispanic, 11% other; parents	5 focus groups; n = 18
Lucan et al (2012) ⁶⁰	USA	18–81 y; 55% F; African American	Semistructured interviews; n = 33
Haynes-Maslow et al (2013) ⁶¹	USA	20–70+y; 69% F; residents of food-insecure area (16% poverty); 85.1% < US \$29 999 income	8 focus groups; n = 68
Schoenberg et al (2013) ⁶²	USA (rural)	18–70+y; 72% F; 88% white, 9% black, 2% other	8 focus groups; n = 99. 6 interviews; n = 20
Baruth et al (2014) ⁶³	USA (urban)	25–50 y; 100% F; 93% African American, 7% other	4 focus groups; n = 28
Knittle & Orshan (2017) ⁶⁴	USA (urban)	Age NR; 100% F; Puerto Rican mothers	Interviews; n = 16

Abbreviations: F, female; NR, not reported.

facilitate healthy eating. However, participants considered the lack of food and nutrition knowledge to be a barrier to healthy eating. Food and nutrition knowledge was considered important for knowing what constitutes a healthy diet and for understanding the benefits of healthy eating for health and disease prevention. Nutrition and cooking information that is accurate, tailored, and accessible was thought to help enhance food and nutrition knowledge. Conversely, an insufficient or unclear understanding of what constitutes a healthy diet, arising partly from doubt over the reputability of information sources, was reported as a barrier to healthy eating. Study participants from low socioeconomic groups suggested that sufficient nutrition literacy was required to use nutrition information labels. Preplanning and having healthy, ready-made meals was also perceived to facilitate healthy eating. This idea, however, was less noted among low-SEP populations, among which the need to plan and prepare healthy meals and foods (especially fruit and vegetables) was frequently viewed as a barrier to healthy eating. For both the general and the low-SEP groups, this barrier was further linked to current time constraints within the lived environment and was exacerbated by an overall lack of cooking skills, which one study found to be more relevant to younger adults.

Psychology

Self-perceptions, emotional state, and mental well-being collectively summarize the psychological factors that were perceived to influence healthy eating. Self-perceptions were reported in relation to factors such as

self-control, self-efficacy, self-esteem, self-respect, self-regulation, and motivation. Possessing positive self-perceptions largely facilitated healthy eating, whereas negative self-perceptions (or the absence of positive self-perceptions) were more likely to influence less healthy eating. It was also noted that these factors could be negatively influenced by external factors. For example, self-control could be overridden in the presence of tempting unhealthy foods that were more likely to provide immediate satisfaction. While personal autonomy and responsibility were notably important, they were often reported as insufficient mechanisms in the absence of any personal agency that guided healthful eating decisions (Mulaney-Day et al,⁴⁷ workplace setting). To a lesser extent, eating choices were described as part of an individual's self-identity.

According to participants from multiple studies, eating could be driven by multiple emotional states. Food cravings, food addiction, and eating for comfort because of life stresses or boredom all reportedly influenced the consumption of unhealthy food. Similarly, a lack of mental well-being or the presence of mental health issues was also thought to be a barrier to healthy eating. These factors were more commonly reported by groups of lower SEP. Comparatively, in some general populations, healthy eating was facilitated by the psychological desire to feel good.

Beliefs and attitudes

While beliefs and attitudes were linked to many psychological self-perceptions, they were differentiated as personal ways of thinking about healthy eating rather than

Table 2 Examples of quotes conveying citizen-centered perceptions that can be used to guide and interpret qualitative research

Factors influencing healthy eating	Quote	Type of setting	Reference
Individual level			
Knowledge and skills	"I knew we should eat 5 portions of fruit and vegetables a day, but I did not know that could help to prevent cancer. . ."	Community	Godhino et al (2013) ²⁹
Psychology	"One barrier for me is emotional health. Like if I'm feeling down or I'm stressed out, I eat crappy food and I prepare terrible food for my family."	Low-SEP community	Whiting et al (2010) ⁵⁵
Beliefs and attitudes	"Oh yes to support their goals in the gym or in sport is the primary reason [to eat healthy] for a lot of my mates. . ."	Community	Ashton et al (2015) ³¹
Physiological preferences	"I don't eat fruits and vegetables, I don't like how [they] taste so I just decide not to consume them."	Community	Gamboa (2015) ³²
Habits	"You just eat the food you were brought up with. . ."	Low-SEP community	Barton et al (2011) ⁵⁶
Social level			
Social networks	"But they'll still hand her another plate of ribs. They'll say she need(s) to lose weight, but at the same time they're still handing her more food."	Low-SEP community	Baruth et al (2014) ⁶³
Sociocultural acceptability and expectations	". . .in terms of society, at least this is how I see it, people live according to the opinions of others rather in terms of what they feel like doing or what is actually good for them. Thus (. . .) not being used to taking a piece of fruit may also be related to this: 'It is pointless, people would make fun of me'. . ."	Community	Godinho et al (2013) ²⁹
Marketing and media	"There's all this junk food, you know, jumpin' out at you. . . the supermarket. Buy one, get one free, great big bags of chips. . ."	Low-SEP community	Kaiser & Baumann (2010) ⁵⁴
Food environment			
Food price and diet affordability	". . .cost-wise, I think it's more effective to get a cheeseburger. . . You get more nutrition for the buck. . . It wouldn't make sense to get a salad."	University/ educational	Quintiliani et al (2012) ⁴³
Food availability	"I'm not normally a chocolate person. . . except if it's right there in front of you."	Workplace	Torquati et al (2016) ⁵¹
Food characteristics	"For me the hardest part is when we shop for 10 or 15 days, you know that fruits and vegetables don't last that long so we don't buy them."	Community	Gamboa (2015) ³²
Lived environment			
Convenience and time	"It's convenient and fast to be unhealthy."	Low-SEP community	Hampson et al (2009) ⁵³
Built and natural environments	"I go by bus [to shop], so it is whatever I can hold, which is not much."	Low-SEP community	Whiting et al (2010) ⁵⁵

Abbreviation: SEP socioeconomic position.

emotional or mental states. These beliefs were related to health, performance, and appearance, and they predominantly facilitated healthy eating. Health beliefs involved recognizing that disease management and prevention, healthy weight maintenance or weight loss, and an increased life expectancy are long-term benefits of healthy eating. Health professionals were often recognized as key individuals who could support these beliefs and therefore promote healthy eating. The belief that healthy eating could achieve shorter-term benefits of enhanced energy or sport performance was also thought to provide some individuals with the incentive to eat healthfully. Additionally, some studies found that healthy eating was facilitated by the belief that it could improve an individual's physical appearance and attractiveness (through weight loss or more generally). Conversely, some detrimental beliefs about food were also reported by multiple participants. These included the acceptability of

overconsumption during pregnancy (Hampson et al,⁵³ low-SEP community), eating out being thought of as treat occasions that permitted unhealthy eating (Hampson et al,⁵³ low-SEP community), distrust of scientific nutrition guidelines and information (Sully,⁵⁷ low-SEP community), and dieting misperceptions. The fear of adverse health outcomes associated with consuming pesticides from fruits and vegetables or the fat content of milk was also a barrier to the consumption of these foods for some individuals. These beliefs and attitudes were common to both general and low-SEP populations.

Physiological preferences

The most frequently mentioned theme in this domain related to taste, whereby unhealthy fast foods were perceived to taste more appetizing than healthier

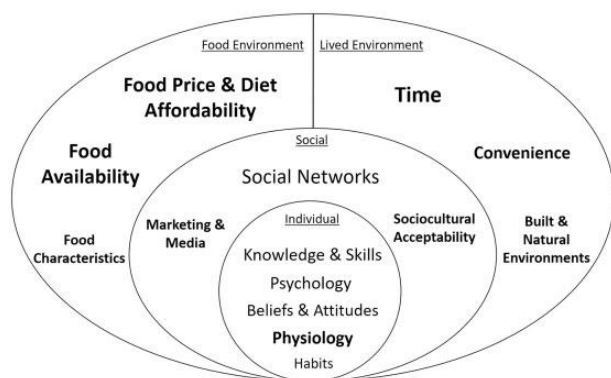


Figure 2 Summary of themes derived from data synthesis, represented according to the socioecological model.²⁵ Size indicates the relative importance of a factor; boldface text indicates that a factor is more commonly identified as a barrier, rather than a facilitator or neutral factor, to healthy eating.

alternatives such as fruit and vegetables. Hunger and satiety were also found to be important, as some studies reported that people perceive fast food to be more satiating than healthy foods. These barriers were further linked to environmental influences and the idea that fast foods are readily available and convenient whenever one is hungry. Some individuals also linked the satiety responses associated with specific foods to psychological factors such as feeling good. Overall, personal food preferences promoted or inhibited healthy eating according to study participants. Both general and low-SEP populations acknowledged these physiological preferences.

Habits

Upbringing and early childhood diet were recognized as key facilitators or barriers to healthy eating, depending on the nature of the dietary patterns to which an individual becomes accustomed. Moreover, the idea of so-called passive consumers arose when some studies found that individuals (particularly males) simply consume the foods that are directly before them (Dumbrell and Mathai,²⁷ community setting). As such, healthy or unhealthy eating habits are formed on the basis of repeated food exposures that are frequently beyond an individual's control. Nonetheless, efforts to eat healthfully were thought to become easier and more habitual with ongoing attempts. The importance of developing healthy eating habits was recognized by both general and low-SEP populations.

SOCIAL LEVEL

Social networks

Social themes were repeatedly reported by most study participants, who explained that eating was a social

activity (Pridgeon and Whitehead,⁴⁹ workplace setting) that occurs across all settings (community, university, and workplace). The mechanisms through which social networks became facilitators or barriers to healthy eating were related to social support, food availability within shared settings, unanimous preferences for healthy food, and the social transferability of food-related behaviors and values. These factors were particularly relevant for family members, especially children. From one perspective, children were thought to promote healthy eating by encouraging good role modeling, but on the other hand, parents felt it was difficult for families to eat healthfully because it was easier to oblige to children's unhealthy food preferences. A few individuals also described women as nutritional gatekeepers (Yeh et al,³³ community setting) for their dominant role in preparing the foods consumed by their families. Witnessing family members experience ill health also facilitated some individuals to eat healthfully.

Beyond family, peers and colleagues were also reported to be influential, depending on how supportive they were of healthy eating. Examples of this included friends sharing food or helping with meal planning, and managers supporting the provision of healthy food within the workplace, thus linking factors across the different socioecological levels. From a contextual perspective, participants from a low SEP were more likely to describe their social networks as barriers to healthy eating compared with participants in general population groups.

Sociocultural acceptability and expectations

The social acceptability of healthy eating was generally considered low and, thus, a barrier to healthy eating (with exceptions appearing to be family, friends, and peers who supported healthy eating or considered healthy eating to be popular or fashionable). Social stigmatization associated with certain foods and cultural norms was generally thought to create pressure to consume unhealthy foods. Consumption of alcoholic beverages and unhealthy snacks such as sweets was associated with sociability, contrary to the consumption of fruits and vegetables, which was not deemed to be "cool." This collectively reinforced the idea that adhering to socially acceptable ways of eating was necessary for social inclusion. Participants in one study, however, did recognize that these social expectations are often unrealistic and contradictory; for example, women cannot be expected to have the "perfect body and eat cake too" (Mabry et al,³⁷ community setting). Body shape was also explored with respect to cultural acceptability and preferences for larger, curvaceous females by one

study targeting African Americans (and conducted in a low-SEP community; Baruth et al⁶³). From a masculine perspective, cultural expectations were also thought to be a barrier to healthy eating. Some male participants suggested that weight gain in (young adult) males was highly sought after and that eating healthy contradicts male stereotypes (Ashton et al,³¹ community setting).

Cultural cooking practices were also reported as important factors influencing healthy eating. They could be a facilitator if, for example, vegetables were an essential component of a Sunday meal, or a barrier if excessive amounts of fat or sodium were used. The idea of acculturation was also raised by several studies, which indicated that the westernization of food culture resulted in a transition away from healthier, traditional food practices.

Marketing and media

The influence of marketing and media was noted as a barrier to healthy eating. Study participants collectively stated that marketing and media channels were used to heavily promote unhealthy foods (Kaiser and Baumann,⁵⁴ low-SEP community) and confuse messages around healthy eating. While this factor was noted as important, the mechanisms through which marketing and media specifically influenced healthy eating were less clear. Some perceptions indicated that they acted as nudges to eat (Allom and Mullan,⁴⁴ university/educational setting) and targeted children with attractive food packaging. Conversely, there were only hypothetical (rather than experiential) indications of how marketing and media could facilitate healthy eating. Suggestions were proffered regarding how healthy foods could be better promoted through better advertising campaigns, labeling, and social media. Some individuals suggested this was the responsibility of public institutions.

FOOD ENVIRONMENT

Food price and diet affordability

A high financial price associated with purchasing healthy food was among the most frequently reported barriers to healthy eating. It was consistently reported that healthy foods, such as fruits and vegetables, were perceived to be too expensive compared with unhealthy foods, which were comparatively cheap and thus more attractive to buyers (Schoenberg et al,⁶² low-SEP community). The price of foods was also thought to vary across retail outlets. Fast food was generally considered to be less costly than home-prepared meals. Additionally, supermarkets and produce markets,

compared with convenience stores, were perceived to offer cheaper items, and the limited access to supermarkets was noted as an additional barrier to healthy eating in rural and remote (often lower-SEP) settings. The role of coupons and price promotions within the supermarket setting was also perceived to incentivize unhealthy food purchases and, thus, consumption. To some extent, it was thought that these pricing strategies could be applied to healthier products to facilitate their consumption. Another financial facilitator to healthy eating was the idea of long-term financial savings in healthcare (Bukman et al,³⁰ community setting), whereby the price of healthy eating was thought to be lower than the medical expenses associated with diet-related chronic diseases. The only study that compared high- and low-SEP groups deduced that preventative factors were more likely to facilitate healthy eating among individuals of higher SEP.

While food price was a common factor mentioned across most studies, the overall perceived affordability of healthy compared with unhealthy diets appeared to be more relevant to lower socioeconomic groups and students in educational settings. Diet affordability was examined in relation to poverty, low-income levels, and competing financial priorities (such as gas and energy costs). Despite this, participants from one study reiterated how the overall affordability of a healthy diet was not just a concern for those of the lowest SEP, and individuals whose income excluded them from government support programs (Lucan et al,⁶⁰ low-SEP community) still found it difficult to afford and consume healthy foods.

Food availability

The availability of healthy food either facilitated or presented as a barrier to the consumption of healthy food for most study participants. In the present food environment, availability was perceived to discourage healthy eating, as unhealthy food was generally thought to be readily available across most settings. Workplaces and universities were all thought to lack healthy options in cafeterias, vending machines, and at social gatherings/events. The limited availability of cooking and food storage facilities was also described as a barrier to healthy eating, particularly in student accommodations. With respect to the community setting, the supermarket was also perceived to be a significant source of unhealthy food, whereas gardens were thought to increase the availability of healthier foods. Within the lower socioeconomic contexts, healthy eating was reportedly limited by food insecurity (including low availability of fruit and vegetables) and low access to supermarkets (often exacerbated by limited transportation).

Food characteristics

The presence of fast food was reported as a barrier to healthy eating, being described as largely unhealthy (Garcia et al,⁴⁰ university/educational setting), tempting, comforting, addictive, tasty, cheap, and ubiquitous. This theme intersects with factors around psychology, food price, and availability and collectively summarizes how these food characteristics promote fast food consumption. Moreover, healthy foods such as fruits and vegetables were commonly associated with characteristics such as unpredictability in terms of perishability and quality. In comparison, fast food was thought to be of predictable quality, which further facilitated its consumption. These perceptions were shared across general and low-SEP populations.

LIVED ENVIRONMENT

Convenience and time

The convenience and ease of purchasing unhealthy food compared with purchasing and preparing healthy food was noted as a barrier to healthy eating. This theme was linked to food availability, whereby the ubiquitous availability of unhealthy fast food catered to convenience-driven lifestyles. One study suggested this was particularly relevant to younger populations who were accustomed to convenience (Yeh et al,³³ community setting). A minority of studies challenged the notion that fast food is convenient by indicating that fruit, vegetables, and dairy can be quick and easy to consume and prepare.

The convenience-driven consumption of unhealthy food was typically mentioned alongside time. Most study participants suggested that a lack of time to purchase, prepare, and cook food was a major barrier to healthy eating. This constraint reportedly elicited its influence through busy lives/schedules (Baruth et al,⁶³ low-SEP community) and time pressures (Schoenberg et al,⁶² low-SEP community). The mechanisms were particularly clear in the university and workplace settings, where work and study demands (eg, short breaks, late working hours, being tired after work) promoted the consumption of convenience foods. Findings from one study further indicated that some members of the public consider convenience food to provide an important public service (Mulaney-Day et al,⁴⁷ workplace setting) by overcoming time as a barrier to eating. The interconnections between time and social influences on healthy eating were also noted. Participants indicated they would rather spend their spare time socializing with family or friends than engaging in food preparation and healthy eating. Several infrequently reported

strategies to overcome time constraints included pre-planning, using quick recipes, and having more frequent breaks at work and university. However, these facilitating strategies were not commonly reported by studies focusing specifically on lower-SEP groups.

Built and natural environments

Some studies identified how additional factors (transportation, geography, and seasonality) within their built and natural surroundings influenced healthy eating. Transportation and geography appeared as factors more relevant to studies targeted at lower socioeconomic groups. The participants in these studies highlighted how limited personal transportation, such as a car, constrained their ability to access high-quality supermarkets or markets and to carry purchases. This factor was further linked to specific geographic barriers such as rurality and poverty; for example, in one study conducted with individuals of low SEP, participants described public transport options as being inconvenient and expressed concerns about personal safety (eg, purchases being stolen). In terms of seasonality, a few individuals indicated that cold weather, compared with hotter weather, resulted in a lower motivation to eat healthfully.

DISCUSSION

This systematic review of 39 studies provides an in-depth summary of how factors across individual, social, lived, and food environments are perceived to influence healthy eating for adults. The present meta-ethnography further suggests that the factors influencing healthy eating are as relevant to lower socioeconomic groups as they are to the general population. At the individual level, nutrition knowledge and skills, beliefs and attitudes, psychology, physiological preferences, and habits were found to be important. Across the social layer of influence, social networks (family, friends, peers, and coworkers), social marketing of unhealthy foods, and the sociocultural acceptability of consuming a healthy diet were consistently identified as major factors influencing healthy eating. While the factors across the individual and social layers of influence included both barriers and facilitators, factors within the environmental layer of influence (food price and affordability, food availability, food characteristics, time, and convenience) were almost uniformly identified as barriers to healthy eating today. This supports the broader literature, which identifies how major changes to food environments and the food supply have contributed substantially to the rise in obesity over the last 4 decades.⁶⁵

The identified factors are consistent with the findings of previous narrative syntheses of both qualitative and quantitative studies.^{7–9} Despite this, the existing literature has not given extensive consideration to demographic variations in these factors, and the synthesis presented here is the first to suggest these factors are generalizable across genders and settings (see [Table S3](#) in the [Supporting Information online](#)). The focus here on adult populations of low SEP also suggests the proposed socioecological model of healthy eating is relevant to low-SEP groups.²⁵ Only minor gender differences were articulated by a few studies, which indicated that men were more inclined to be passive consumers (ie, consume the foods that are most readily accessible) than women, who were often described as nutritional gatekeepers. Nevertheless, these perceived gender roles do not imply that interventions should prioritize men above women, as men and women are cohabiting and women do not have fewer dietary risks or lower obesity rates than men.^{1,66} Across the included settings, there was also some indication that fresh and healthy produce was less available in rural and remote communities. While this reiterates existing evidence,⁶⁷ the findings of the present review demonstrate that food availability is still an important barrier to healthy eating in the urban food environment because of the high availability of unhealthy food.

Although this meta-ethnographic analysis found the factors influencing healthy eating among adults in lower-SEP populations to be consistent with those influencing the general population, there were a few differences in how these factors were experienced. While food price was identified by most studies as a major influence on healthy eating, it was reported by all studies that reported specifically on lower socioeconomic groups. The overall affordability of a healthy diet was also noted as a more salient barrier for individuals of lower SEP (Power et al,⁵² workplace setting). This finding is supported by empirical evidence indicating that food price and the relative unaffordability of healthy diets for lower income groups are likely to contribute to socioeconomic inequalities in diet quality.^{68,69} However, a recent analysis of dietary affordability in Australia challenges this notion by suggesting that healthy diets may be more affordable than unhealthy diets, regardless of household structure.⁷⁰ This raises questions about whether food price and diet affordability are perceived barriers or objective barriers to healthy eating. While additional evidence is required to clarify this, addressing cost and affordability as a barrier to healthy eating, whether a perceived or an actual barrier, should be a public health priority.

In the present analysis, supermarket availability and access to healthy foods was also identified as a

greater barrier to healthy eating for lower socioeconomic groups than for the general population. This finding is consistent with previous systematic reviews, which have found lower supermarket access and more unhealthy food retailers in neighborhoods of lower, compared with higher, SEP.^{67,71} This analysis further revealed that transportation and geographical challenges in areas of lower SEP may exacerbate issues with healthy food availability. Socioeconomic differences in these environmental structural factors (food price and availability) were also perceived to contribute to inequities in healthy eating by policy actors in a recent study by Friel et al⁷² (along with other factors relating to housing and the built environment, employment [income], and social protection). Although the current analysis did not identify all the upstream drivers of healthy eating (such as housing, employment, and social protection), a vast body of evidence recognizes that addressing these key determinants of healthy eating, alongside factors further downstream, is paramount to achieving good health across the socioeconomic gradient.⁷³ The results presented here not only reiterate the importance of addressing these structural factors but also add to the current understanding of the social influences that can pose major barriers to healthy eating (particularly in lower-SEP groups).

Implications for future practice and research

A comprehensive approach targeting the determinants of healthy eating across all levels of influence is ultimately required to improve population diets and reduce obesity and diet-related noncommunicable diseases. To ensure that attempts to improve population diets do not unintentionally widen socioeconomic inequalities in diet quality, weight, and health, it is important to prioritize interventions that target the barriers to healthy eating identified among adults with a lower SEP.⁴ These barriers were found to be similar to those identified in the general population (albeit to a greater degree for some barriers) and highlight the promise of universal policies that act across an entire population, regardless of risk. Future research should empirically examine socioeconomic differences relative to each barrier to healthy eating while concurrently evaluating proposed policies for their distributional impact across socioeconomic groups. The environmental and social barriers to healthy eating identified in this review are of concern, given how pertinent they appear to be to the general population and how often they represent more salient barriers for lower socioeconomic groups. Public health interventions may continue to be met with limited success if they target factors solely at the individual level (eg, nutrition knowledge) in an environment that is

strongly perceived to hinder the desired behavior change. While this review focused on adults, it is important for future research to identify factors that influence healthy eating (and how these may differ) across the life course, from preconception to adulthood.

Limitations

This meta-ethnography is limited by the primary data reported in the included studies.⁷⁴ Quality appraisal highlighted the difficulty in ascertaining how issues with reporting quality reflect methodological limitations and the conceptual value of the study themes included in this synthesis. This result exemplifies existing debate around the propriety of appraising the quality of qualitative studies.^{75,76} Although there are no best-practice methods and quality tools have been criticized for inadequately assessing qualitative epistemologies,⁷⁵ the Critical Appraisal Skills Program tool was used to facilitate discussion about whether a study provided sufficient depth and meaning to the review question (as recommended by the Cochrane Collaboration).⁷⁶ This helped in reaching consensus despite frequent discrepancies attributable to differing levels of experience with qualitative research and its subjective nature. More widespread use of rigorous reporting criteria, such as the Standards for Reporting Qualitative Research⁷⁷ and the Consolidated Criteria for Reporting Qualitative Research,⁷⁸ is needed to enhance the reputability and quality of qualitative research and meta-syntheses.

Moreover, qualitative data can only be interpreted as perceptions, and additional research is required to triangulate the findings presented here with empirically measured factors. A lack of comparative studies also limited the identification of factors specific to socioeconomic groups. Nonetheless, data saturation was observed in this review, suggesting that addressing these perceptions is paramount and that additional studies are unlikely to identify different factors. While the socioecological model is also limited in its ability to clearly describe the nature of the relationships between factors across different levels,⁷² it can be used to comprehensively identify, define, and interpret these factors, thus enhancing current understanding of leverage points for change.

CONCLUSION

This review provides a rigorous, comprehensive synthesis and comparison of the available evidence on factors that influence healthy eating across adults' individual, social, and environmental (food and lived) worlds. Future research should focus on addressing these factors. Importantly, this analysis identified factors within

the environmental and social layers of influence that appeared to represent more salient barriers to healthy eating for lower socioeconomic groups than for the general population. Policies that target and mitigate the barriers to healthy eating are necessary to create environments that can improve population diets across the socioeconomic gradient.

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Supporting Information

The following Supporting Information is available through the online version of this article at the publisher's website.

Appendix S1 MOOSE checklist

Table S1 MEDLINE search strategy

Table S2 Quality appraisal results

Table S3 Detailed description of results/themes

Table S4 Themes identified by included studies

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