A Review of Barriers to Healthy Eating in Rural and Urban Adults

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Abstract

Background: People encounter a variety of barriers that impact their ability to eat a healthy diet. Because of the higher obesity rates and poorer health status in rural adults, attention is needed on examining the gaps in knowledge about healthy eating barriers in rural adults. **Purpose:** The purpose of this manuscript was to describe what is known about barriers to

healthy eating in both rural and urban adults. The social ecological model was used as a framework using individual, interpersonal, organizational, and community factors to organize barriers to healthy eating.

Methods: Forty-two studies were found that discussed barriers to healthy eating in adults. Of these, 14 were conducted solely in rural settings, 2 in mixed rural and urban settings and the remaining 26 studies done in urban settings.

Results: The impact of barriers unique to rural settings is not well understood as the majority of studies found were conducted in urban settings. Barriers that rural adults face that may contribute to their greater occurrence of obesity were higher cost of healthy foods, lack of time, lack of social support, work issues and lack of access to grocery stores.

Conclusion: More research is needed to provide a greater understanding of the unique challenges rural people face and how to eliminate barriers to maintaining a healthy diet.

Keywords: barriers, healthy eating, rural, obesity

A Review of Barriers to Healthy Eating in Rural and Urban Adults

Individuals can positively influence their own health and well-being by choosing diets or making food choices based on nutritional recommendations (Teixeira, Patrick, & Mata, 2011). Unfortunately, many people encounter a variety of barriers that impact their ability to eat a healthy diet, therefore contributing to the high rates of overweight and obese adults and subsequent chronic medical conditions.

Background and Significance

Typical attributes of a healthy eating pattern are eating whole fruits and vegetables, low fat dairy products, eating a variety of foods, eating regularly, and eating foods high in vitamins and

minerals. (LaCaille, Dauner, Krambeer, & Pedersen, 2011). Despite the apparent knowledge of the importance of fruits and vegetables in a healthy diet (Eikenberry & Smith, 2004), one-third of Americans report consuming fruits and vegetables less than one time daily (Centers for Disease Control and Prevention, 2013). Finding ways to increase healthy foods, such as fruit and vegetable intake, as part of a healthy diet, should focus on factors influencing intake, such as eliminating barriers of healthy eating (Eikenberry & Smith, 2004). The challenge, not only in the United States (US), but globally, is centered on how to help people eat healthy foods and limit intake of unhealthy high-fat, high-calorie, processed, and convenience foods (Sassi, 2010).

Changing eating behaviors and removing barriers for healthy eating is important for all adults at risk for becoming overweight or obese. However, it is even more important for individuals in rural areas because the occurrence of being overweight or obese is significantly higher (Befort, Nazir, & Perri, 2012). Not only do rural people experience greater rates of becoming overweight and obese compared to their urban counterparts, but they also have higher dietary fat and calorie consumption and less access to fresh fruits and vegetables (Bolin, Gellamy, Ferdinand, Kash, & Helduser, 2015; Nebraska Health and Human Services System , 2004). The seriousness and magnitude of the obesity problem in rural areas is also a central focus of national initiatives. One goal of Healthy People 2020 (n.d.) is to eliminate differences in obesity risk due to geographic location, such as living in rural areas where approximately 20% of the U.S. population lives (United States Census Bureau, 2010). Greater attention should be paid to the problem of obesity in rural areas because these individuals have higher rates of premature death from chronic diseases such as chronic obstructive pulmonary disease, cardiovascular disease and some cancers (Befort et al., 2012; Eberhardt & Pamuk, 2004).

The purpose of this review was to describe what is known about barriers to healthy eating in both rural and urban adults. Since the majority of studies have been conducted in adults living in urban areas with limited information about rural adults, it was necessary to describe what is currently known in both populations. Because of higher obesity rates and poorer health status in rural adults, the focus was on examining what is known and not known about barriers to healthy eating encountered by adults living in rural areas.

Methods

A literature review was conducted to identify studies that discussed barriers to healthy eating in adult populations. The databases PubMed, CINAHL, Cochrane and Scopus were searched using the key words "barriers," "healthful eat*," "healthy food," "diet," "nutrition," "obesity," "overweight," "adults," "urban," and "rural" in various combinations. The search was not limited by date of publication but was limited to the English language and adult human subjects. To be included, studies had to discuss barriers of healthy eating in adults as the main focus. If the study examined both barriers to healthy eating and physical activity, the article was included. Studies were excluded if they focused on eating disorders, healthy eating behaviors of children or adolescents, or focused solely on barriers to exercise or physical activity. Both quantitative and qualitative studies were included in the review.

The search for literature revealed a majority of studies being conducted in urban areas compared to rural settings. Forty-two studies were found that discussed barriers to healthy eating in adults. Of these, 14 were conducted solely in rural settings, 2 in mixed rural and urban settings, and the remaining 26 studies were done in urban settings. Sixteen of the twenty-six urban studies (62%) were conducted in international locations such as Europe, Australia and Canada. Because the majority of the studies were done outside the US, it was felt these

international studies should be included to provide a more comprehensive review of the barriers experienced by adults.

Although rural is defined in a variety of ways, if the investigator asserted or maintained they were studying a rural population, the article was included in the review. In this paper, perceived barriers was defined as an individual's evaluation of the potential obstacles that may lessen the likelihood of engaging in a specific health behavior (Glanz, Rimer, & Viswanath, 2008), in this case healthy eating.

The social ecological model (SEM) is a systems model with multiple bands of influence that emphasizes the interaction between, and interdependence of, factors within and across all levels of a health problem (Rimer & Glanz, 2005). According to Fleury and Lee (2006) multilevel perspectives consistent with the SEM are useful approaches in health behavior research and health promotion efforts. Therefore, the SEM was used to organize and examine healthy eating barriers experienced by adults because barriers are multifaceted and function on multiple levels. The following four levels of the SEM were used to review barriers to healthy eating: individual, interpersonal, organizational, and community (McLeroy, Bibeau, Steckler, & Glanz, 1988). Each level of the SEM is first defined followed by a summary of the barriers identified in each level, starting with rural studies followed by a summary of studies conducted in urban settings. Each level concludes with a summary of the barriers discovered for that level along with the implications for rural populations.

Results

Individual Barriers

The individual level of the SEM includes characteristics of the individual such as knowledge, attitudes, behavior, self-concept, skills, and developmental history (McLeroy et al.,

1988). Across various studies, barriers that prevented individuals from participating in healthy eating behaviors included lack of time, cost, taste preferences, lack of knowledge, and lack of motivation or willpower (Biloukha & Utermohlen, 2001; Eikenberry & Smith, 2004; Gough & Conner, 2006; Kearney & McElhone, 1999; Welch, McNaughton, Hunter, Hume, & Crawford, 2009; Welsh et al., 2012; Whiting, Vatanparast, Taylor, & Adolphe, 2010).

Lack of time.

The concept of lack of time in relationship to healthy eating is complex (Welch et al., 2009). It may reflect an individual's perception of time available for food shopping and preparation, but may also be associated with their perception of the time demands related to other aspects of life including job, studies or family that may take precedence over healthy eating (Gedrich, 2003).

Research conducted in rural areas was scarce with only two studies found examining lack of time as a barrier to healthy eating. Specifically, for rural women, healthier eating occurred more often when time was not seen as a barrier (Yates et al., 2012; Sequin, Connor, Nelson, LaCroix, & Eldridge, 2014).

Research conducted within urban areas in Europe revealed lack of time, specifically lifestyle choices (e.g. leisure activities) and work commitments, as a major perceived barrier to healthy eating (Biloukha & Utermohlen, 2001; Gough & Conner, 2006; Kearney & McElhone, 1999; Lappalainen, Saba, Holm, Mykkanen, & Gibney, 1997). Working more than 40 hours per week was associated with a greater number of time-related barriers and behaviors regarding healthy eating in young urban adults from the US. Barriers included: (a) being too busy to eat healthy, (b) being too rushed in the morning to eat a healthy breakfast, (c) not enough time to sit

down and eat a meal, and (d) perceiving eating healthy took too much time (Escoto, Laska, Larson, Neumark-Sztainer, & Hannan, 2012).

Lack of time was cited as a barrier to healthy eating for Australian urban women primarily due to long hours at work (Andajani-Sutjahjo, Ball, Warren, Inglis, & Crawford, 2004; Welch et al., 2009). Women were significantly less likely to consume portions of a healthy diet (i.e., fruits and vegetables) and more likely to consume portions of an unhealthy diet (i.e., fast foods and energy-dense snack foods) due to time constraints (Welch et al., 2009; Williams, Thornton, & Crawford, 2012). Older women were less likely to report time pressure as a barrier to healthy eating than younger women, possibly because of decreased demands on their time due to fewer employment or child care responsibilities (Welch et al., 2009).

Cost.

The cost of buying healthy foods was another area with limited research findings pertaining to rural adults with only two studies located. These studies found when rural women perceived cost as a minimal barrier to buying healthy foods, they in turn ate a healthier diet (Yates et al., 2012; Sequin et al., 2014).

The cost to purchase healthy foods was cited as a barrier to healthy eating for urban adults living in Europe (Biloukha & Utermohlen, 2001), the US (Keim et al., 2011; Lucan, Barg, & Long, 2010; Marcy, Britton, & Harrison, 2011; Wolf et al., 2008), and for low-income Canadian adults (Whiting et al., 2010). Not only was current cost of healthy foods an issue, but many urban adults, in the US and globally, reported the rising cost of purchasing healthy foods as an ongoing barrier (Biloukha & Utermohlen, 2001; Eikenberry & Smith, 2004; Gough & Conner, 2006). The reported high cost and lack of access to fruits and vegetables were among the most troublesome for a group of urban adults from the United Kingdom (UK) who were actively

trying to increase fruit and vegetable consumption (John & Ziebland, 2004). Australian urban women cited the cost of buying healthy foods as the most common barrier to healthy eating and ultimately maintaining weight (Andajani-Sutjahjo et al., 2004).

Taste preferences and perceptions.

No studies were found explicitly examining taste preferences and perceptions (i.e., healthy eating is boring) in rural adults. In contrast, multiple studies conducted in urban areas were found. The perception of healthy eating as "boring" constituted a major barrier to changing current diets, with taste clearly being presented as a key barrier to the intake of more healthy foods for a group of urban men from the UK (Gough & Conner, 2006). Taste, along with quality and freshness, was also identified as a barrier for European Union adults, although this was an issue for more men than women (Biloukha & Utermohlen, 2001; Kearney & McElhone, 1999). Australian women with a taste preference for fruits and vegetables were more likely to consume components of a healthy diet and less likely to consume components of an unhealthy diet (Williams et al., 2012). A study of U.S. urban adults found that concerns about the reduction of taste quality of a low-fat, healthy diet was the most important factor affecting food decisions (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998).

Lack of knowledge.

No studies were found specifically addressing lack of knowledge of healthy eating as a barrier for rural adults. Research conducted within urban areas of Europe has shown lack of knowledge about what constituted healthy foods to be a barrier for not eating a healthy diet (Biloukha & Utermohlen, 2001; Ziebland, Thorogood, Yudkin, Jones, & Coulter, 1998). Low-income Canadian adults also reported lack of knowledge as a barrier for healthy eating (Whiting et al., 2010). In a study of urban U.S. adults, men rated knowledge as a barrier for healthy eating

higher than women did (Welsh et al., 2012). Men's relative lack of knowledge related to healthy eating may reflect an overall gender difference regarding food behavior as women historically have been more involved in grocery shopping and cooking (Welsh et al., 2012). Another European study found lack of knowledge was not a major obstacle to healthy eating as these adults already believed their diets were healthy (Kearney & McElhone, 1999).

Lack of motivation or willpower.

Lack of motivation as a barrier to healthy eating in rural adults was not found in the existing literature. However, perceived lack of self-control or willpower for eating unhealthy foods was identified as an important barrier to healthy eating in urban adults living in the US (Welsh et al., 2012) and in younger adults and in those with higher education living in Europe (Lappalainen et al., 1997). Similarly, lack of motivation for changing their diet and losing weight was one of the greatest barriers for healthy eating in multiple European studies of urban adults (Biloukha & Utermohlen, 2001; Gough & Conner, 2006; Jones, Furlanetto, Jackson, & Kinn, 2007; Kearney & McElhone, 1999; Lappalainen et al., 1997; Michaelidou, Christodoulides, & Torova, 2012; Sabinsky, Toft, Raben, & Holm, 2007). Australian women cited lack of motivation as the most common perceived barrier to healthy eating and ultimately maintaining weight (Andajani-Sutjahjo et al., 2004).

Summary of Individual Level Barriers

Across studies, lack of time and the cost of purchasing healthy foods were the two most commonly cited and perhaps the two most influential factors that created barriers to healthy eating. Because most of the studies were qualitative or self-report, it is difficult to know if the identified barriers were actual barriers or a perception of barriers experienced by the individual. The majority of the studies examining individual level barriers were conducted in urban

populations with information specific to rural populations being minimal. Two studies used mixed samples of rural and urban adults but did not report differences between the groups so it is unknown which barriers were unique or more difficult for rural adults (Eikenberry & Smith, 2004; Jilcott, Laraia, Evenson, & Ammerman, 2009). Many of these individual barriers reported by urban adults may be relevant in rural adults as well, but more studies are needed to confirm these findings. More studies are needed in rural adults that examine individual level factors that create unique barriers to healthy eating in rural adults.

Interpersonal Barriers

According to the SEM, the interpersonal level includes formal and informal social support systems, including family, work group, and friendship networks (McLeroy et al., 1988). Barriers at the interpersonal level seem to originate from the lack of support from family and friends and the living situation of the individual (living alone).

Lack of Social Support.

Lack of support and negative support are both barriers to healthy eating and have been reported in both rural and urban low income women. While women tried to prepare healthy meals for the family, lack of encouragement from partners/spouses in rural settings (Parker & Keim, 2004) and refusal to eat healthy foods by the entire family in urban settings hindered their attempts (Chang, Nitzke, Guilford, Adair, & Hazard, 2008). Another barrier to eating and preparing healthy foods mentioned in mixed rural and urban populations was accommodating food preferences of the entire family, including their preference for unhealthy snack food (Chang, Baumann, Nitzke, & Brown, 2005: Eikenberry & Smith, 2004; Jilcott et al., 2009). Lack of support was also an issue for women when they felt they had no one to confide in, no

one to share their healthy eating problems with and no one to simply listen to them (Chang et al., 2008).

In contrast, the majority of studies examined social support for healthy eating from a positive perspective. In rural Southeastern US, family support for healthy eating was significant for men but not women (Hermstad, Swan, Kegler, Barnette, & Glanz, 2010). It is possible that this greater sense of social support for healthy eating among men is because women often do the food shopping and meal preparation for the family. Social support from families was also positively associated with healthy eating in rural women, including an increased consumption of fruits and vegetables (Yates et al., 2012). The most commonly experienced support for rural women from both family and friends were compliments on changing eating habits, discussion of eating habit changes, and encouragement not to eat unhealthy foods when tempted which improved healthy eating behaviors (Walker, Pullen, Hertzog, Boeckner, & Hageman, 2006). One could assume that the lack of these supportive behaviors may have a negative effect on rural individuals' healthy eating behavior, but more research is needed in this area.

In studies involving mixed samples of urban and rural adults, family or living with someone was the most common promoter of healthy eating whereas living alone was a frequent barrier to healthy eating (Eikenberry & Smith, 2004). For women, their family's preference for unhealthy snack food was the most prominent influence on shopping and food found in the home (Jilcott et al., 2009). Women in urban Australia who perceived more family support, including family members eating and encouraging them to consume a healthy diet and discouraging eating unhealthy foods, were more likely to consume components of a healthy diet and less likely to consume components of an unhealthy diet (Williams et al., 2012). Anderson, Winett, and

Wojcik (2007) found that higher levels of social support from families for shopping for healthier foods such as fruits and vegetables to bring into the home was related to healthier eating.

Summary of Interpersonal Level Barriers

Lack of social support from family members was the most powerful barrier at the interpersonal level that hinders attempts to eat a healthy diet. For many individuals, family members are the people they spend the most time with and consequently who have the most influence on their eating behaviors. Because lack of social support as a barrier has not been studied much in populations other than low-income women, regardless of setting, we do not know the impact lack of social support has on healthy eating in other groups. Limited studies were found measuring lack of social support. More studies are needed to determine what factors constitute perceived lack of support as a barrier, the obstacles it creates, and how individuals can overcome the challenges for healthy eating created by lack of support.

Organizational Barriers

The organizational level of the SEM includes worksites which occur and operate under a common set of rules and policies that guide behavior (McLeroy et al., 1988). The primary organizational factor for adults that may pose a barrier for healthy eating is the work environment.

Work environment.

Healthy eating may be challenged in the workplace by societal trends that include (a) longer working hours, (b) compressed work weeks (working a traditional 40-hour week in less than 5 days), (c) shift work, (d) longer distances to travel between work and home, (e) reduced job security, and (f) part-time or temporary work, which are realities of the modern workplace

("Healthy People 2020", n.d.; Jabs & Devine, 2006). Longer hours in the workplace are increasingly affecting the health and lives of U.S. adults ("Healthy People 2020", n.d.). Research has shown that workers experiencing stressors, both physical and psychological, at work are at increased risk of injuries, heart disease, and digestive disorders ("Healthy People 2020", n.d.).

Farming is one occupation commonly found in rural areas. Befort et al. (2012) found an increased risk of obesity in young rural adults aged 20 to 39. A potential explanation for this is that equipment has become more computerized and mechanized, contributing to the increased prevalence of obesity among younger rural workers compared to the older generation of farmers (Befort et al., 2012; Bolin et al, 2015).

Jilcott et al. (2009) found the social environment (presence of "tempting" foods with little nutritional value) at work to be a barrier for healthy eating in a mixed sample of urban and rural women. A qualitative study examining healthy eating behaviors in small, rural worksites (i.e., fewer than 50 employees) found multiple barriers (Escoffery, Kegler, Alcantara, Wilson, & Glanz, 2011). More than half of respondents identified (a) lack of time, (b) limited selection of healthy food options at work, (c) job stress leading to eating unhealthy foods, and (d) location of their job (e.g. small, rural community), which could limit access to healthy foods, as barriers to healthy eating at work.

Studies conducted in urban areas have also demonstrated that the worksite creates a potential barrier for healthy eating, specifically because of the amount of time spent in the work environment (Welch et al., 2009). Australian women reported (a) inflexible hours, (b) unpredictable hours, and (c) shift work including night and weekends as barriers for healthy eating in the work environment (Welch et al., 2009).. Doctors from the UK perceived their

employer and work environment as unsupportive of healthy eating due to lack of breaks and unhealthy cafeteria food (Winston, Johnson, & Wilson, 2008). Similarly, long work shifts, lack of breaks due to poor staffing and busy workloads were identified as barriers to healthy eating in a study of nurses in the UK (Faugier, Lancaster, Pickles, & Dobson, 2001).

Summary of Organizational Level Barriers

At the organizational level, the work environment was the primary influence with similar barriers found in both rural and urban settings. The rural work environment has been studied less than urban workplaces. However, from the available literature, it appears that the setting of the workplace, whether rural or urban, was not the primary reason people experienced barriers to healthy eating. Many of the barriers identified at the organizational level were issues uncovered at the individual level as well, such as lack of time. It is difficult to entirely separate these identified barriers because it is the individual at work and their personal perceptions that influenced what was seen as barriers in the work place. While the work environment itself can contribute to these barriers, such as the number of hours spent at work, many of these issues can be attributed to the perception of the individual. More studies are needed focusing on rural worksites with an emphasis placed on decreasing the barrier to eating a healthy diet.

Community Barriers

The community level of the SEM includes the connections among institutions and informational networks within defined boundaries which collectively comprise the larger societal structure (McLeroy et al., 1988). Community can be defined by geographic location, membership in a particular group, or possession of certain beliefs that produce affiliations. The main community barriers identified that impact healthy eating includes lack of access to stores

selling healthy foods and the media that can give inaccurate nutrition information or glamorize foods.

Lack of access.

Lack of access to obtaining food within the community encompasses multiple issues. The primary access issues included (a) geographic isolation, (b) distance to the nearest grocery store, and (c) limited transportation. In addition, quality and cost of available food and access to healthy foods such as fruits, vegetables, low-fat food items and whole grain products created problems for many adults (Chang et al., 2008; Jilcott et al., 2009; Liese, Weis, Pluto, Smith, & Lawson, 2007; Patterson, Moore, Probst, & Shinogle, 2004; Sequin et al., 2014; Yousefian, Leighton, Fox, & Hartley, 2011).

Rural dwellers face barriers to healthy eating because of their physical isolation and lack of access to healthy food sources (Befort et al., 2012). Food sources in rural areas are not evenly distributed. Because of economic considerations, many grocery stores in rural areas are consolidating into fewer but larger stores. Generally these larger stores are concentrated in bigger towns in the local areas leading to areas of concentration and areas where few or no grocery stores exist (Morton, Bitto, Oakland, & Sand, 2005; Sharkey, 2009; Sharkey & Horel, 2008). These changes in the food environment are adversely affecting those living in rural areas because of cost (Sharkey, 2009). Without easy access to local grocery stores, individuals either have to pay higher travel costs to reach a grocery store, or pay higher prices for more nutritious foods such as fresh fruits and vegetables at local convenience stores, if those healthier options are even available (Liese et al., 2007; Sharkey & Horel, 2008).

Another potential source for healthy foods at home is the maintenance of a family vegetable garden. There is some perception that rural areas have better access to fresh

vegetables because of farming. However Kegler, Escoffery, Alcantara, Ballard, and Glanz (2008) found most rural people did not have a produce garden because they believed they did not have time, felt they were too old, or thought gardens were too much work and could buy produce cheaper than actually growing it. Rural residents felt that having access to local farmers' markets and having the opportunity to join a community garden was easier than having a garden at home (Sequin et al., 2012).

Research conducted primarily within urban areas has shown that populations with limited or difficult access to a grocery store (supermarket) tend to live in neighborhoods with greater disadvantages and/or with a higher proportion of minority residents (Sharkey, 2009). Residents of these same neighborhoods tend to consume fewer fruits and vegetables, and often have a higher body mass index (BMI) than do residents of affluent areas (Inagami, Cohen, Finch, & Asch, 2006; Morland, Diez Roux, & Wing, 2006). The lack of availability of large supermarkets is of concern because large supermarkets tend to offer food at lower prices and provide a wider variety and higher-quality food products than do small grocery stores (Horowitz, Colson, Hebert, & Lancaster, 2004). The presence of supermarkets in urban communities was associated with a lower prevalence of obesity (Morland et al., 2006). In contrast, the presence of convenience stores was associated with a higher prevalence of obesity in the US (Morland et al., 2006). Inagami et al. (2006) also found higher BMIs in individuals who lived and shopped at grocery stores that were in disadvantaged urban neighborhoods and in those who traveled farther to access a grocery store.

Media.

Aggressive marketing of unhealthy foods by the media was seen as a barrier for rural adults (Kaiser & Baumann, 2010). In addition, the media was found to be a negative barrier in urban

adults and could influence dietary choices and intake through conflicting dietary information. Whiting et al. (2010) found that low-income Canadians were influenced negatively by the media as these individuals reported they were not clear on what was accurate information regarding healthy eating despite all the information found in magazines and on television. Urban men from the UK did not like the government using the media to tell them what was healthy or unhealthy and ultimately what they should or should not eat (Gough & Conner, 2006).

For college students, a commonly cited barrier regarding advertising was making the food look so enticing that the individual wanted to go buy that food right away, even though they knew it was an unhealthy food (Garcia, Sykes, Matthews, Martin & Leipert, 2010). Another barrier included the economic aspect of advertising campaigns such as buy one, get one free for unhealthy snacks, such as candy bars. The individual sees that buying more is a better value, therefore taking advantage of the better value and thus indulging in more candy (Garcia et al., 2010).

Summary of Community Level Barriers

Lack of access to healthy foods and the influence of the media were both barriers noted at the community level for rural and urban adults. The amount of time many individuals spend using various sources of media (e.g. TV, internet) could be a possible explanation of the influence media messages have on maintaining a healthy diet. Because of advances in technology and improved means of communication, the barriers the media creates seem to affect rural and urban adults in similar ways. More studies are needed to determine how to assist rural residents to overcome the lack of access barrier and to improve the ability to purchase healthier foods easier and cheaper than currently available.

Discussion

It is imperative that barriers to healthy eating for rural individuals receive more research attention. Rural residents experience higher poverty rates (Kusmin, 2010) and are less likely to meet recommendations for fruit and vegetable consumption than urban residents (Lutfiyya, Chang & Lipsky, 2012). Ver Ploeg et al. (2012) found that while the majority of rural residents live within 10 miles of a grocery store, those with lower income tend to live more than 10 miles from a grocery store. Unhealthy eating behaviors may lead to the development of obesity and other chronic diseases such as cardiovascular disease, hypertension, diabetes, and several types of cancer (National Heart, Lung, and Blood Institute, 2013). Despite several national initiatives to eliminate differences in these health issues due to geographic location, few studies have been done examining the unique barriers to healthy eating in adults living in rural areas.

Based on the studies reviewed, the most common barriers to healthy eating for rural adults included individual-level barriers of lack of time to shop for and prepare healthy meals and the higher cost of healthy foods. Lack of social support was the most common barrier at the interpersonal-level. The most frequent organizational-level barrier was time spent at work while lack of access to grocery stores and healthy foods created the most common barrier at the community–level. Having access to and availability of healthy foods, the time to prepare healthy meals and social support from family and friends is necessary so adults can follow a healthy diet. Better access to retail stores that sell healthier food options may have a positive impact on a person's diet, yet these locations may be less available in rural neighborhoods ("Healthy People 2020", n.d.). People in rural areas live farther from the nearest supermarkets meaning average distance, time, and out-of-pocket cost to get healthy foods is greater for rural than urban individuals (United States Department of Agriculture, 2009). Given that shopping at

supermarkets is associated with greater fruit and vegetable consumption and traveling greater distances to grocery shop is associated with higher BMI, the scarcity of supermarkets in rural areas may help explain the increased rates of obesity (Inagami et al., 2006). Finally, the higher cost of food can impede healthy eating in rural communities (Hardin-Fanning & Rayens, 2014).

While the various types of barriers for healthy eating were categorized into different levels based on the SEM, in reality they do not work in isolation. The influences on healthy eating behaviors interact across these different levels. A great deal of the literature addressed individual level barriers. Lack of time, identified as an individual barrier, has influence on the other levels as well. For example, an individual's perception of lack of time available to eat healthy was the result of the amount of time spent involved with work and family commitments which took away time to shop and prepare healthy meals. They may also need to travel considerable distances to reach a grocery store which also takes more time.

This review uncovered more international studies that examined barriers to healthy eating in urban adults compared to studies conducted in urban U.S. adults. The findings indicated similar barriers to healthy eating in urban settings, regardless of the country the study sample was located in. Because of the lack of research in rural adults, both nationally and internationally, more research needs to be conducted to determine if rural adults face similar barriers to what was found in urban adults or if they have other barriers that need to be discovered and addressed.

The few studies that were conducted in rural populations consisted primarily of women, so even less is known about the barriers men face. With men being the primary workers in rural occupations, such as farming, and with younger rural adults having increased rates of obesity compared to older rural adults (Befort et al., 2012), it is critical to learn more about what barriers

exist in rural populations and how to intervene to prevent the increasing rates of obesity and comorbid conditions that arise secondary to being overweight and obese.

Once there is more knowledge about the barriers rural adults face, more intervention studies can be conducted to determine how to effectively help rural adults overcome these barriers to eating a healthy diet and ultimately to lose weight or maintain a healthy weight and decrease the incidence of chronic diseases that arise from being overweight/obese. Interventions to reduce the occurrence of overweight and obesity and improve access to healthy foods need a multidimensional approach that focuses on individual behavior change, interpersonal influence, organizational issues, and community influences (Gamm, Hutchison, Dabney, & Dorsey, 2003).

Limitations

The broad range of definitions of rural and the variability in rural populations across studies was a concern. Only two studies provided the actual population size of the county used in the study to provide evidence of rural status (Escoffery et al., 2011; Nothwehr & Peterson, 2005). Casey et al. (2008) was the only study that reported the criteria used to define rural, the U.S. Census Bureau, which included areas with populations less than 50,000 people. There can be great variability in the population of a community identified as rural along with the actual services offered and availability of food sources. The lack of information about the rural population and disparate definitions of rural complicated the interpretation of results and comparisons across studies. It would help to have the use of a consistent or standard definition to define rural in future studies. Nevertheless, there remains inherent value in examining barriers found in urban versus rural populations. It is essential for future research studies to define the rural or urban setting (e.g., Rural Urban Commuting Area Codes (RUCA) codes) so

comparisons and conclusions can be made more confidently as this line of research needs to continue to ensure the needs of rural and remote populations are understood and met.

Because of a lack of strategies identified for rural communities to use to overcome barriers, strategies applicable for urban communities are often made to fit rural areas (Barnidge et al., 2013). Adapting evidence to a rural setting is challenging based on characteristics of the rural environment itself, such as social norms, less access to stores, less people living in the area, fewer health care providers, and cultural practices unique to rural settings (Hennessy et al., 2010). In addition, more studies are needed to determine the strategies that work in rural areas to overcome barriers to healthy eating.

Conclusion

More data are needed to know exactly what barriers for healthy eating exist for rural adults so intervention strategies to overcome barriers and increase access to healthy foods can be identified. Multilevel interventions that combine both behavioral and environmental components to support healthy eating behaviors are essential. Nurses have the knowledge and skills to assess nutritional status and are well positioned to provide leadership at all levels to promote healthy diets and ultimately healthier communities.

The importance of understanding the unique challenges that rural adults face in the quest to eat a healthy diet is critical, especially for nurses working in rural settings. This review found multiple barriers to healthy eating in adults. It is essential to explore new pathways to improve the health of rural people and not blindly accept the existing conditions and barriers simply because of their location on a map. Significant steps are needed to make healthy food choices available and affordable to all people in all types of geographic locations, including urban and rural (Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008). From a social ecologic perspective,

the goal should be a to reduce barriers encountered at each level; individual, interpersonal, organizational, and community, in an effort to support healthy eating behaviors in all settings in which people live, work, and play.

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