Review Article

Poor nutrition and chronic diseases among minority populations

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Abstract

Minority populations are more subject to chronic diseases such as obesity, hypertension, and various cancers due to their lack of access to quality food and knowledge of adequate nutrition. Theories such as the Health Belief Model and the Social Cognitive Theory have been used throughout various studies to understand why minority populations are more likely to develop chronic diseases stemmed from poor nutrition. Components such as socioeconomic status, education, median household income, ethnicity, interpersonal and intrapersonal factors were all analyzed using the aforementioned theories to understand why minorities are disproportionately affected in regard to receiving adequate nutrition and prevention of chronic diseases. Various government policies and programs have been created to aid minority families in purchasing quality food and to promote more measures against chronic diseases. Further research in understanding why minority populations are disproportionately affected may include systemic and environmental racism, including administration of preventive healthcare resources.

Keywords: Chronic Disease; Health Belief Model; Health Equity; Minority Groups; Nutritional Status; Social Class.

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Nutrition is a critical aspect of health and development. A healthy diet can protect against chronic diseases such as obesity, heart disease, diabetes, and cancer. The World Health Organization (WHO) emphasizes that consuming less salt, processed sugars, along with industrially produced trans fats are essential for a healthy diet. Diets consisting of proper nutrition include macronutrients, proteins, micronutrients, carbohydrates, and healthy fats. The recommended daily consumption of fruits and vegetables by the United States Department of Agriculture is 2 cups per day. However, only 1 in 10 adults meet their recommended daily number of fruits and vegetables and 9 out of 10 children do meet their prescribed daily recommendations (1,2). In 2018, a study documenting childhood obesity in the United States noted obesity prevalence to be 18.5% among ages 2 to 19 years; indicating somewhat of a plateau in comparison to previous years. This is not the case among ethnic minorities.

Obesity prevalence among the minority youth population is 23.6% among Hispanics, 20.4% among African Americans, and 25% among Chinese Americans. The obesity prevalence is 14.7% among White youth (3). Low socioeconomic status is associated with food insufficiency, poor pediatric health, and poor overall diet. Children and adolescents living in low-income households are twice as likely to be overweight and 4 times as likely to develop

food insecurities. Additionally, adolescents whose family head of household received less than a high school education were 67% more likely to have a lower quality diet. Minority populations disproportionately have lower incomes. Within the Hispanic population, 18.5% of families receive incomes below the poverty line, in comparison to the 5.3% of white families receiving incomes below the poverty line. Food insecurities beginning at a young age can lead to additional health implications, such as depression, anxiety, and distorted body image (3). Moreover, poor eating behaviors and lack of education concerning adequate nutrition are not only fueled by low socioeconomic status, environmental factors, and education, but can also prolong unhealthy eating behaviors into adulthood (4).

Although the obesity epidemic greatly affects the youth population, the prevalence of obesity in adulthood is far more severe, reaching 42.4% of the total adult population in 2018. Among African Americans, obesity prevalence was 49.6% and 44.8% among Hispanics, versus 42.2% for non-Hispanic whites. Other chronic conditions such as heart disease, type II diabetes, some forms of cancer, osteoporosis, high cholesterol, and high blood pressure become prevalent in adulthood and are directly correlated with unhealthy eating behaviors (4). These debilitating illnesses stress the importance of practicing healthy eating behaviors at a young age and continuing to do so through adulthood, as healthy eating behaviors serve as crucial health measures.

However, food availability within communities becomes less than adequate regarding nutrition as neighborhoods climb down the socioeconomic ladder. Low-income minority neighborhoods have a larger number of low-quality small food stores and fewer high-quality supermarkets (5). Children living in deprived and disproportionately affected communities may consume more unhealthy foods due to a lack of healthy food sources. Food accessibility and availability are further determined by car accessibility, geographical settings, and location of public schools. Children living in counties with lower median household incomes and higher percentages of minority residents, are more exposed to unhealthier food environments in school. About 46% of convenience and small food stores (typical products include foods high in trans-fat, high sodium, and high fructose corn syrup) located in areas with over 50% of the population identifying as minority are within walking distance from most elementary schools (6).

The Healthy People 2030 initiative has developed numerous objectives aiming to improve nutrition and promote healthy eating habits in children, adolescents, and adults. Efforts to increase the proportion of healthcare visits by adults with obesity, which includes counseling on weight loss, nutrition, or physical activity, is one such example (7). This objective may be incredibly helpful to minority populations, as disparities in healthcare often hinder access to resources such as nutrition counseling. There are many other objectives that propose to enhance nutrition education in schools, as well as increase daily consumption of fruits and vegetables (7). These objectives play a crucial role in reducing the incidence of childhood obesity, which further leads to a reduction in the proportion of obese adults.

A crucial factor in understanding determinants of health behaviors and the process of changing behaviors, is to analyze the behavior in question by way of theories. Theories are interrelated concepts that provide a systemic view of events by specifying the relationship between variables (8). There are several theories that are used to analyze behaviors among

disadvantaged populations. Some theories include the health belief model and the social cognitive theory, which have been used extensively to analyze unhealthy eating behaviors among minority populations.

During the 1960s, Albert Bandura developed what was then known as the Social Learning Theory (SLT) and is what is now the Social Cognitive Theory (SCT). The SCT concludes that learning takes place within a social context, highlighting the interactions between a person, the environment, and behavior (8). A key component of the SCT is the emphasis on external and internal social reinforcement. Bandura highlighted the need to consider how individuals learn and maintain a particular behavior, while also taking the social context in which they typically perform a behavior into consideration. The SCT take an individual's past experiences into account, which in turn influence reinforcements, expectations, and expectancies; all of which, shape whether an individual will engage in a specific behavior. Through utilization of the SCT's four concepts: self-regulation, reciprocal determinism, social influence, and cognitions, key aspects of unhealthy eating behaviors in minority communities can be explored and further explained (8). Within the four overarching concepts, constructs include behavioral capability, self-efficacy, expectations, expectancies, loci of control, vicarious learning, self-regulation, reinforcements, and social norms.

A cross sectional study utilizing the SCT was completed to determine if moral engagement, behavioral capability, and self-efficacy can assess the perceived outcomes of childhood obesity prevention programs among African American families living in rural communities. The study examined perceptions of childhood obesity among African American caregivers residing in rural communities. Caregivers were defined as individuals legally responsible for a child. The authors of this study specifically researched if moral disengagement and environment correlated with the outcome of childhood obesity prevention programs.

SCT concepts were assessed by examining caregivers in the form of an interview and paper-based survey. Outcome expectations were examined in a manner of asking whether parents' eating habits play a role in the likelihood of a child developing obesity. Self-efficacy was whether the caregiver can aid their child in living a healthier lifestyle. Behavioral capability was assessed by asking if their child is at a recommended healthy weight for their age. Reinforcement was asked by whether their child's healthcare provider discusses their child's weight with them. Environment was assessed by asking if their child felt safe in the community. Moral disengagement was assessed by whether the caregiver limits high calorie food intake.

Results from the study revealed that moral disengagement factors were key in childhood obesity prevention. Albert Bandura's definition of moral disengagement involves a combination of social and cognitive factors and how they interact with each other. Bandura argued these factors allow individuals to analyze their unhealthy behaviors and rationalize how they affect their self-image (9). In this study, moral disengagement was examined by using factors indicating healthy behaviors and it was revealed that increased moral disengagement led to better outcomes in childhood obesity prevention programs. Examples of moral disengagement were caregiver's decreasing their children's portion sizes or offering healthier snacks, or even limiting the number of snacks a child eats to prevent childhood obesity (10). Further studies also connected increased moral disengagement with improved self-

efficacy of mothers when preparing healthy and affordable meals for their children.

When analyzing the environmental factors of the study, the importance of modifying measures to the needs and limitations of the community in question are crucial. For the rural setting in this study, behavioral determinants of health, family characteristics, religious commitment, and social cohesion of the community must all be considered when creating measures. These modifications help ensure that measures are catered specifically for families and the community, which in turn will offer the greatest amount of outcome success. Different cultures respond differently to measures. It is crucial to consider prior experiences and expectations and modify them to offer every opportunity of success.

The Health Belief Model (HBM) is a type of expectancy value theory and is one of the broadest, most utilized health behavior theories. With the HBM, the subjective view of an outcome is related to the subjective probability or expectation than an action will result in a desired outcome. Key constructs of the HBM state that individuals will take action to prevent or screen for a particular health condition if they perceive susceptibility, consequences of the condition are severe, proactivity in preventing the condition will promote some benefit in reducing a threat, barriers to preventing the condition outweigh the perceived benefits, and promote self-efficacy (11). These key constructs and characteristics of the HBM have enhanced understanding of unhealthy eating behaviors amongst minority populations.

For example, a cross-sectional study completed by Creighton University utilized a Health Assessment Questionnaire (HAQ), which assessed constructs of the HBM, to analyze factors that influence physical activity among urban minority residents. A stratified random sampling method was used from a pool of housing project residents, local churches, and other community centers. The purpose of this study was to examine how each participant's perception of community intervention regarding promoting exercise facilities and healthy food locations help determine whether access to health promotion activities increased opportunity for better, healthier lifestyles and how those opportunities relate to increased exercise. Perceived susceptibility was assessed using questions related to overall health, such as "Have you ever been told you have any of this condition?" Perceived severity was assessed using questions to determine the individual's knowledge risk factors and medical consequences. Perceived benefits were assessed by belief that pursuing a recommended action could decrease the risk or severity of potential illness. Self-efficacy was defined by the individual's motivation to partake in physical exercise. The results were aggregated and categorized into high and low risk levels for mild-to-moderate physical exercise. Of the 229 participants, 63.3% reported doing less than 150 minutes of physical activity a week, 24.0% 150-300 minutes, and 12.7% over 300 minutes per week. Through this study, participants were able to address each construct of the HBM and how that affected their likelihood and willingness to engage in weekly physical activity. This study, along with many others, allows for specification of behavioral determinants through social, environmental, and psychological factors.

Intrapersonal factors consider an individual's knowledge, beliefs, skills, attitudes, self-conception, and personal preferences (11). These factors play a prominent role in eating behaviors and offer insight into populations disproportionately affected regarding nutrition. One study examining intrapersonal factors in relation to unhealthy eating behaviors in low-income Mexican American women showed

a large influence of personal identity and knowledge about healthy weight loss methods. Currently, 31% of the Mexican population is obese, with about 40% of that population being women. The participants' knowledge and attitudes about weight loss and healthy eating were largely influenced by traditional Mexican culture. Prevailing literature describes the view of a curvaceous body shape by Mexican culture as a determinant of health, wealth, and femininity. These positive attitudes towards a more overweight frame have led to continued unhealthy weight gain. Many of these women, however, reflect internalized views of weight-related values and attitudes that prevail in American culture. Describing themselves as fat, overweight, or plump, which indicated health concerns about their weight. Conflicting cultural views often hindered weight reduction efforts and shifted personal attitudes as the participants often felt their traditional identity as Mexican mothers providing bounties of food to be more important (12). Not only does cultural influence play a role in personal attitudes, but it has also influenced weight loss methods. The participants discussed how many turned to traditional Mexican weight loss solutions or commercialized products to lose weight, as many of the participants lacked knowledge and access to resources promoting healthy weight loss. Many women were seen to have a small understanding about the medications they were taking, how they could affect them, and what the potential side effects were. The women's overall discussion of their attitudes and cultural identity were prominent factors in how weight loss and unhealthy eating behaviors influenced them on an intrapersonal level.

Interpersonal factors are influenced by social networks that may vary from friends, family, colleagues, social figures, and any other group regularly influencing an individual's behaviors. In minority communities, these social networks are largely composed of family, members from religious organizations, and close friends. A study completed in Alabama assessing interpersonal factors of unhealthy behaviors amongst African American children and adolescents, found children's eating behaviors were largely influenced by immediate social influences, in this case, family members and home environments. Nearly half of the children from rural African American families in Alabama are considered obese or overweight. This trend is seen throughout many different racial and ethnic minority groups (4). Children receive roughly 57%-62% of their daily food intake at home (13). This indicates a strong parental influence of what a child consumes each day. This particular study was completed in a county located within Alabama's "Black Belt," a string of counties originally named for their agricultural desirability, now constitute 9 out of the 10 poorest counties in Alabama. Participants for the study were chosen from a pool of elementary schools in the county and age ranged from 4-13 years. When questioned about where they receive most of their meals, 73% of participants answered from home. Many also answered from school. Within this county, convenience stores and fast-food restaurants were in closer proximity to neighborhoods and schools than restaurants or supermarkets were. When assessing the primary food sources of the participants' families, many parents stated purchasing food from a grocery store was more of a hassle due to how far away they were. It was shown in the study that the closer in proximity a family was to a convenience store or fast-food restaurant, the more likely they were to frequent them. Due to the low socioeconomic status amongst many of the families studied, the low prices at these more convenient locations also provided an incentive to frequent convenience stores and fast-food restaurants (9).

Eating habits developed during childhood and adolescence carry over into adult life. Trends in late childhood and adolescence that often result in obesity are excess consumption of energy dense foods and lack of physical activity, which are typically learned or allowed behaviors from parents (14). Children spend an equal amount, if not more time, in school than at home. Ensuring a healthy and educated relationship with food during childhood and adolescence is not only determined by parental influence but is also largely influenced by education systems (15).

The United States Department of Agriculture has implemented several nutrition programs tailored to minority populations regarding healthier food access and education. These programs vary from the Child and Adult Care Food Programs, School Breakfast Program, National School Lunch Program, and the Summer Food Service Program. Each program includes a set of guidelines aiming to educate children and adults on healthier eating by emphasizing a reduction in consumption of processed fats and foods with high sodium and sugar content. (United States Department of Agriculture). For example, the National School Lunch Program (NSLP) operates in public and private schools, as well as childcare institutions, providing low-cost or free nutritionally balanced lunches to children each day (16). For many schools in minority communities, these federal programs provide crucial nutrition to children who would otherwise not receive it.

These programs play a tremendous role in adolescent and child nutrition. In 2016, 30.4 million children participated in the NSLP. The Supplemental Nutrition Assistance Program (SNAP) was specifically designed to aid low-income families and foster children by increasing their food purchasing power (17). Families with SNAP benefits may purchase foods such as bread, cereal, non-alcoholic beverages, fruits, vegetables, meat, fish, and poultry. The SNAP program currently serves 38 million people. Low-income mothers also receive benefits under the Special Supplemental Nutrition Program for Women, Infants, and Children, which grants federal funding to states for supplemental foods, physician referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women. This program also provides these services to infants and children up to the age of five who need nutritional supplements (18).

A sense of community is strong among minority populations. As a result, many unhealthy eating behaviors stem from interpersonal and community factors. A study in Baltimore, Maryland analyzed the association between fast food consumption and social networks in minority public housing communities. The probability of respondents eating fast food weekly compared to respondents who did not have members of their social network consuming fast-food weekly, increased by 51% (5). This same analysis was seen with respondents who had a member of their social network consuming fast food daily, which in turn saw a 15% increase of daily fast-food consumption. Fast food provides a cheap, easy way to feed a family, which makes frequent consumption more appealing.

Environmental factors such as geographic location and community affluence can tremendously influence the quality of food available in grocery stores and markets. Low-income or minority neighborhood grocery stores often do not meet the same food quality standards as those in more affluent neighborhoods. This trend has influenced many low-income residents to often travel outside their neighborhoods to get food. Some neighborhoods experienced a total absence of quality food sources, forcing residents to travel elsewhere to buy

groceries (18). This disparity emphasizes not only the geographical barriers to healthier, better-quality foods, but highlights food insecurity among minority populations (4). *Feeding America* is an organization aiming to aid and relieve populations experiencing hunger due to lack of income and resources. In 2018, 14.3 million American households experienced food insecurities. African American communities are twice as likely to face hunger than white, non-Hispanic communities. Getting enough to eat is a consistent struggle for 1 in 4 African American children. More than 18% of Latino children are at risk of hunger and 1 in 6 Latino households struggle with hunger (19). These disparities not only highlight that access to enough food is a crucial component to maintain a healthy lifestyle, but how geography can influence healthy eating behaviors in minority communities.

Discussion

In order to successfully alter unhealthy eating habits in minority populations, all the previous factors must be considered and intentionally applied. While analyzing organizational, environmental, policy, intrapersonal, and interpersonal factors are crucial to understand behavior, intervention must be tailored to each population, respectively. Education, family history, underlying health issues, and susceptibility all vary dramatically across differing populations. A particular method of intervention may be successful within white populations but could fail among African American populations. Through extensive research, I have found taking a more holistic approach to health intervention is the most successful way to change behavior, especially among minority populations. A study looking to develop culturally appropriate weight-management programs among African American women concluded that there were clear discrepancies in how women in the study viewed obesity (20). The decision to lose weight is based largely on individual perception. Weight perception differs by culture, with African American women half as likely to consider themselves obese or overweight than their white counterparts. Recognizing these cultural differences is a crucial component to successfully intervene and alter a behavior.

As for children and adolescents, targeting schools and curriculum is key to reducing childhood obesity incidence. Institutional intervention is what I believe to be most successful within this age group, as it may be the only resource facilitating healthier eating habits. Federally funded programs such as the National School Lunch Program (NSLP), the Child and Adult Food Program, the School Breakfast Program (SBP), and the Summer Food Service Program, are some of the many resources providing adequate nutrition to children, adolescents, and adults (17). All the factors regarding appropriate health promotion among minority populations will not only foster healthier eating habits, ultimately reducing obesity and other chronic diseases, but with the added success of behavior theories, can foster intentional change within varying minority populations.

Further research may be done to further examine the effects of geographical and environmental racism and how they affect community wellbeing among minorities. As the aforementioned research noted, many underserved communities lack basic access to not only quality nutrition, but standard preventive health resources. As chronic diseases begin to overwhelm global health systems, targeting systemic causes, such as racism, as well as genetics, may enhance understanding as to why underserved, minority populations are more greatly affected than their white counterparts.

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