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FATALISM AND ITS EFFECT ON HEALTH BEHAVIORS IN MISSISSIPPI AND LOUISIANA RESIDENTS

A THESIS APPROVED FOR THE

DEPARTMENT OF SOCIOLOGY

BY THE COMMITTEE CONSISTING OF

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Table of Contents

Abstract ..... **v**

Introduction **1**

Literature Review **2**

Methods **12**

Results **17**

Discussion **20**

References **22**

Appendix 1: Tables of Results **30**

Appendix 2: Summary and Descriptive Statistics for the Independent and External HBM Variables **36**

Appendix 3: Figures **41**

Appendix 4: Questionnaire **44**

Abstract

The Health Belief Model maps out multiple sources to explain actions people take or do not take in regard to health behaviors. One's sense of control over one's own health is a central component of the health belief model. Individuals with a strong sense of control over their outcomes are said to have high self-efficacy. Individuals with a weak sense of control over their outcomes are said to have low levels of self-efficacy which can be thought of as high levels of fatalism. Previous studies suggest that individuals with high self-efficacy are better able to make changes to improve their health, while individuals with high fatalism are less able to make changes to improve their health. Relatively few studies, however, have examined the impact of other variables outside of the health belief model. Using survey data from residents in southeastern Mississippi and Louisiana, this study examined the impact of fatalism (low self-efficacy) on self-reported physical health and dietary intake controlling for social support, community health perceptions, and religiosity. The results suggest that fatalism is not statistically related to the outcomes examined. Furthermore, inclusion of the variables external to the health belief model did not alter the relationship between fatalism and the outcomes.

Introduction

Lifestyle and health-related behaviors, such as smoking, poor diet, low levels of physical activity, and drinking are detriments to mortality and morbidity world-wide (Lantz et al. 1998; Stringhini 2010). Furthermore, studies suggest that protective health-related behaviors—especially physical activity and appropriate diet—are increasingly lacking in modern lifestyles (Peters et al. 2002; Roberts and Barnard 2005). Modern lifestyles contribute to unhealthy behaviors for numerous reasons, such as sedentary work environments, increasing stress and work hours, abundance of processed foods, and increasing availability of tobacco and alcohol (Damle 2018).

In response to these societal trends, strategies and programs have developed to help individuals improve their behaviors and lifestyle. These programs typically are either individual- or community/public-focused. Individual-based programs range from information and self-help programs (Timmerman 1999) to medicine-based programs administered by a physician or other healthcare provider (World Health Organization 2018; Zeng et al. 2013). Community-based programs can be implemented at the local, regional, or national level, and are typically directed by public health officials (Blank et al. 2007). In fact, health promotion sciences—the application of social and behavioral sciences, educational strategies and techniques, and epidemiological methods to reduce health risks in individuals and communities—has grown exponentially over the last several decades in response to these challenges (Raingruber 2017).

Research suggests that many of these health behavior and lifestyle modification programs can be effective. For example, results from the large-scale, national US Diabetes Prevention Program suggest that lifestyle modification can be achieved and sustained over several years

(Rockette-Wagner et al. 2017). Other studies have found similar results for lifestyle changes to improve diabetes (Knowler et al. 2002), weight loss (Wadden et al. 2012), and physical activity (Ohta et al. 2004). Furthermore, research suggests that many of the findings from clinical trials have been successfully applied in various real-world studies outside of well-controlled clinical settings (Ali et al. 2012).

Previous research suggests that, in general, individuals tend to make successful lifestyle changes when their efficacy and self-determination are high (Khwaja 2007; Knowler et al. 2002; Leung et al. 2020; Nuñez 2016; Seear et al. 2019; Walker et al. 2012). The concept of "fatalism" is the inverse of high self-efficacy and self-determination. Fatalism refers to an attitude of resignation in the face of some future event which is thought to be inevitable (Garrett 2018; Kane 2002). In the context of lifestyle changes, fatalism refers to the belief by individuals that they are not able to improve their health outcomes and any effort to do so is for naught (Benghiac 2013; Shen et al. 2009). The existing literature shows a robust inverse relationship between fatalism and lifestyle changes. There are few—if any—studies, however, that examine whether the relationship between fatalism and lifestyle changes is altered by the inclusion of other variables outside the health belief model. The purpose of this study is to understand the impact of fatalism on health behaviors such as diet and physical activity and whether this relationship is altered by the psycho-social factors community health perceptions, social support, and religiosity.

Literature Review

Health Behaviors and the Health Belief Model

Health-related behaviors, or simply health behaviors, are actions that contribute to health. The contribution to health may be positive or protective, that is it contributes to health. Likewise, the contribution to health may be negative or a risk, that is it contributes to illness. Irwin

Rosenstock (1966), one of the pioneers of health behavior research, articulated a nuanced definition of health behavior. He suggested that the central focus of behavior scientists should be to understand why and under what conditions people take action (or intentionally do not act) to prevent, detect and diagnose disease. Rosenstock (1966) and others (for example, see Kasl and Cobb 1966a; 1966b) argued there are three types of health-related behaviors: health behaviors, illness behaviors, and sick-role behaviors.

Health behavior is an activity undertaken for the purpose of preventing disease or detecting disease by a person who is asymptomatic and who feels well and is fully functioning (Kasl and Cobb 1966a; 1966b). Eating a healthy diet and exercising are simple examples of health behaviors intended to prevent disease. Going to the doctor for regular check-ups or for screening tests are examples of health behaviors intended to detect asymptomatic diseases. These examples are positive or protective behaviors. Smoking, for example, is a behavior with a known risk or negative contribution to health (Pampel and Rogers 2004). Illness behavior, by contrast, is an activity undertaken by a person who feels ill or is otherwise not well, for the purpose of detecting and diagnosing the problem, such as going to see a physician for a diagnosis to understand what ails him/her/they (Kasl and Cobb, 1966a; 1966b). Finally, sick-role behavior is the activity undertaken by those who consider themselves ill for the purpose of getting well, for example receiving medicine so that they may improve their current health (Kasl and Cobb 1966a; 1966b). The concept of sick-role behavior is an adaptation of Talcott Parsons' broader construct of the sick role (Parsons 1951). The sick role is comprised of two rights and two responsibilities for persons who are ill (Parsons 1951). An individual who is sick has a right not to be blamed for his or her illness. That person also has the right to be excused—temporarily—from his/her/their normal social roles and responsibilities. An individual who is sick, however,

has the responsibility to make getting well a priority and the responsibility to seek appropriate care and treatment for an illness (Parsons 1951).

Social scientists, physicians, and policymakers have attempted to understand why some individuals engage in various protective health-related behaviors, while others do not behave in ways to maintain or improve health (Glanz and Bishop 2010). Researchers have developed several frameworks to explain and predict health-related behaviors. The most well-known and influential is the health belief model (Carpenter 2010; Glanz et al. 2008). Originally developed in the 1950s by a team of social psychologists at the U.S. Public Health Service, the primary impetus was to better understand the failure of screening programs and why people were deciding not to get screened, especially for tuberculosis (Skinner et al. 2008). The health belief model has been applied to account for various of health-related behaviors, such as early detection screenings and immunizations (Coe et al. 2012), patients' response to symptoms of disease (Henshaw and Freedman-Doan 2009), compliance with medical directives and medical regimens (Ross and Guggenheim 1983), and lifestyle behaviors (Daddario 2007; Gristwood 2011).

The initial iteration of the health belief model consisted of four theoretical constructs: perceived susceptibility, perceived severity, perceived benefits and barriers, and cues to action. The model suggests these four constructs, in combination, help to explain and predict health-related behavior. Susceptibility refers to an individual's subjective assessment of risk of developing a health condition or problem. The model predicts that individuals who perceive that they are susceptible to a particular health problem will engage in behaviors to reduce their risk of developing the health problem (Rosenstock 1966). Perceived severity refers to an individual's assessment of the potential consequences of a health condition or problem. The model suggests that individuals who perceive the consequences of a health problem as serious are more likely to

engage in healthy behaviors to prevent the health problem from occurring (Rosenstock 1966). Together, perceived susceptibility and perceived severity are often referred to as perceived threat. In fact, later iterations of the health belief model use perceived threat as one of the predictors of health-related behavior (Carpenter 2010). Perceived benefits and barriers of action refer to the subjective assessment of the value and obstacles, respectively, of engaging in health-related behavior (Rosenstock 1966). The value and benefits typically are conceived of in terms of the likelihood of a particular behavior reducing the threat (seriousness and susceptibility) of a health condition. Perceived barriers to a given action often include perceived danger (e.g., side effects, discomfort, and pain), inconvenience, and expense. Typically, action is the result of the net difference between benefits and barriers. That is, the perceived benefits must outweigh the perceived barriers for an individual to engage in health-promoting behavior (Janz and Becker 1984). The final component in the original health belief model are cues to action. Cues are a stimulus or trigger to engage in health-related behaviors (Rosenstock 1966). These cues are typically categorized as internal (e.g., pain or other symptoms) or external (e.g., advice from a friend or doctor or illness of a family member). Cues activate the decision-making process to act (or not act) (Jones et al. 2015).

The primary constructs from the original iteration of the health belief model remain key components. The model, however, has undergone several revisions. Figure 1 shows the graphical representation of the full model. Additional variables have been added to the model. Social demographic variables such as gender, age, and race are commonly included in the health belief model (Carpenter 2010). Another significant change is the different ways of modeling the relationships among the constructs in the model (Carpenter 2010). For example, most iterations of the health belief framework model the demographic variables as moderators of the perception

variables (Becker 1974). Perceptions of threat (severity and susceptibility) and perceptions of benefits and barriers are modeled as the product of race, gender, age, and so forth. The most notable revision to the model, however, was the addition of the self-efficacy construct (Rosenstock et al. 1988). Rosenstock et al. (1988) argued that advances made in social cognitive theory (previously and sometimes referred to as social learning theory, especially the work of Bandura (1977a; 1977b; 1986) merited inclusion in the health belief model to understand explain and understand health-related behavior. The most important contribution of Bandura's work is his articulation of the concept of self-efficacy (efficacy expectation) as a concept separate from outcome expectation (Bandura 1977a; 1977b). An outcome expectation—the probability that a given behavior will lead to a given outcome—is similar to the health belief model concept of perceived benefit. By contrast, efficacy expectation is the conviction that an individual can actually execute the behavior required to produce the outcome (Bandura 1977a; 1977b). Rosenstock et al. (1988) argued that the distinction between outcome expectations and efficacy expectations is important because both are required for behavior.

[----------INSERT FIGURE 1 HERE----------]

Fatalism

Self-efficacy refers to an individuals' perception of their ability and competence to successfully perform a behavior. A related concept, fatalism, can be construed as the inverse of self-efficacy. In fact, fatalism has been referred to as a "failure of self-efficacy" (Bernard et al. 2012, p. 4). The precise definition of fatalism

> varies from the strict sense of a system of beliefs which holds that everything has an appointed outcome which cannot be altered by effort or foreknowledge, to a sense of resignation based on the realities of a difficult life-situation, to a more imprecise set of connotations covering cynicism towards established values of work and order (Whelan 1996, p. 46).

What all iterations of the definition have in common is a sense of inability or incompetence to effect a change—whether that sense is from an ingrained belief system or a specific cynicism (Benghiac 2013; Shahid et al. 2020; Straughan and Seow 1998).

The majority of the existing literature has focused on the positive impacts of self-efficacy on health behavior, such as an increase in physical activity due to high self-efficacy (Ashford et al. 2010). There is a smaller body of literature that has examined the negative impacts of fatalism on health behavior (Amuta et al. 2017; Caplan and Schooler 2003; Hamilton et al. 2014; Savage et al. 2013). The findings from these studies about fatalism's effect suggest that the mental anguish and fear related to health outcomes result in less health-contributing behaviors (Hamilton et al. 2014; Roberts et al. 2000; Savage et al. 2013).

Variables External to the Health Belief Model

Whether focused on the self-efficacy side or the fatalism side of individuals' perceptions about their ability to effect a change, findings using the health belief framework generally show an association with health-related behaviors. The relationship is relatively robust across various dimensions, such as location, time, and specific health behavior. While the framework is widely used and relatively successful in predicting health behaviors, many have argued that the model has not been implemented fully. Strecher et al. (1997), for example, argued that too often the

health belief model has been implemented with only the four original constructs and with only additive effects on behavior. Conceptually, the framework is suggestive of moderating effects and examining the relationships among the model constructs. In practice, the model is rarely used in this way (Carpenter 2010). As noted above, this study will examine whether the relationship between fatalism (i.e., low self-efficacy) and health behaviors is altered by the inclusion of variables external to the health belief model: community health perception, social support, and religiosity.

Community Health Perception. Culture is the beliefs, signs, and symbols of a social group (Bourdieu 1984). More specifically, culture is the rules, customs, beliefs, language, arts, knowledge, collective memories, and collective identities developed by members of a social group (Griswold 2008). The values of a culture are embodied in its rules, customs, language, arts, and identities. These values are unique to social groups and are generally passed to members of the group in the socialization process (Reber 1993). Previous research has demonstrated community health perceptions are related to health behaviors such as diet and exercise (Welch 2011). More importantly, culture affects perceptions of health and illness, beliefs about causes of disease, and appropriate treatment options (Juckett 2005; Unger and Schwartz 2012). *The Spirit Catches You and You Fall Down* (Fadiman 1997) is one of the most influential examinations of the connection between culture and health behaviors. Fadiman, a journalist, documented the collision of cultures between American medicine and Hmong culture. Fadiman told the story of a young Hmong child, Lia Lee, who began having seizures as an infant. The American physicians diagnosed Lia with epilepsy and prescribed a medicine regimen for her. Based on their understanding of why their child was ill, the family largely ignored the medications in favor of traditional remedies from their culture: herbs, shamanism, and animal

sacrifices, which in doing so sadly left the child losing all higher brain functions (Fadiman 1997).

Social Support. Social support generally refers to having a network of family and friends who can provide support (Allgöwer 2001; Haslam 2005). The network of family, friends, and others can aid or comfort an individual having to cope with biological, psychological, or social stressors (American Psychological Association 2021). The support can take various forms. Emotional support (also referred to as non-tangible support) refers to actions that make another feel cared for. Instrumental support, by contrast, refers to specific physical acts such as providing money, food, housekeeping, and other chores. The final category of support is informational support. This refers to providing information to help someone (Taylor et al. 2000; Towey-Pappas 1981).

The health behavior literature suggests that social support and health behaviors are positively associated. A recent review article concluded the more social support someone has, the more likely that person is to engage in healthy behaviors (Latkin and Knowlton 2015). The strong association between behaviors and social support is evident across numerous behaviors, such as diet, alcohol consumption, and tobacco use (Harvey and Alexander 2012) as well as exercise (Smith et al. 2017). Social support is also associated with behavior modification such as weight loss behaviors and outcomes (Kiernan et al. 2012).

Religiosity. French sociologist Émile Durkheim defined religion as a "a unified system of beliefs and practices relative to sacred things, that is to say set apart and forbidden, beliefs and practices which unite into one single moral community, called a church, all those who adhere to them" (1915, p. 47). Further, Durkheim (1915) suggested that religion creates social cohesion, promotes social control (i.e., consistency in behavior), and provides meaning and purpose during

life's transitions and tragedies. The term religiosity refers to the significance or relevance of the unified belief system to an individual (Clements 2015). Sociologists and other scholars of religion often measure the significance of religion for an individual using several indicators of belonging, behaving, and believing (Clements 2015). Belonging refers to whether an individual identifies with a formal religious institution or church. The behaving aspect of religiosity refers to the religious activities in which people participate, such as the frequency of attendance in religious worship or frequency of prayer. The final indicator of religiosity is believing—the extent to which an individual believes in God (or gods), the afterlife, spirits, and other tenets of a religion (Clements 2015).

The general consensus from previous studies is that religion has a protective influence on a number of health-related behaviors and outcomes for individuals (Barkan and Greenwood 2003; Chatters 2000; Koenig 2015) and populations (Chatters 2000; Levin et al. 1996). For example, multiple epidemiologic studies have demonstrated a positive association between religious service attendance and lower all-cause mortality (McCullough et al. 2000; Oman and Reed 1998; Strawbridge et al. 1997). Religiosity is generally associated with specific health behaviors such as lower levels of alcohol consumption (Luczak et al. 2014), tobacco use (Garrusi and Nakhaee 2012), and more general risky activities such as risky sexual behavior (Simons et al. 2009).

While the overall effect of religion on health behaviors and outcomes is positive (King 1990), religion may also be associated with negative outcomes, such as poorer mental and physical health status, and inappropriate use of health services (Ellison and Levin 1998; Levin 1994). The negative association between religiosity and religious affiliation and health is generally attributed to specific religious teachings (Schlundt et al. 2008) that forbid some

medical procedures and treatments (Ellison and Taylor 1996). Other religious teachings related to negative health outcomes revolve around the idea that illness is punishment for sin (Holt et al. 2014). A relatively familiar example of these type of religious teachings are those of the Christian Science church. The church "does not require that Christian Scientists avoid all medical care—adherents use dentists, optometrists, obstetricians, physicians for broken bones, and vaccination when required by law—but maintains that Christian Science prayer is most effective when not combined with medicine (Christian Science 2021). Research has shown that members of the Christian Science faith have poorer health outcomes than members of other faiths without the same proscriptions to healthcare (Prentiss 2002).

The mechanisms or pathways by which religion and religiosity impact health—whether the impact is positive or negative—are generally categorized into one of four types. These different mechanisms are summarized by Oman and Thoresen (2002, p. 365):

> Religion influences health by: (1) any mechanism, including well-established factors such as social support and improved health behaviors; (2) additional mechanisms, such as enhanced positive psychological states (e.g. faith, hope, inner peace) acting through psychoneuroimmunologic or psychoneuroendocrinologic pathways; (3) offering psychological strength for acquiring or maintaining positive health behaviors; or (4) causally influencing health by distant healing or intercessory prayer.

Research Aims

The impact of the health belief model—and specifically the construct of fatalism (or low self-efficacy)—on health outcomes and behaviors is well established (see for example Amuta et

al. 2017; Caplan and Schooler 2003; Hamilton et al. 2014; Savage et al. 2013). Likewise, the effects of other variables outside of the health belief model, such as community health perception, social support, and religiosity, are also well-documented. To date, however, few studies have examined how variables in- and outside the health belief model are inter-related (Carpenter 2010). The lack of more complex models examining the relationships among the variables has been a source of frustration for some health behavior researchers (Carpenter 2010; Strecher et al. 1997). The current study aims to address this gap by examining whether a key component of the health belief model— the effect of self-efficacy/fatalism on health-related behaviors—is altered by community health perception, social support, and religiosity. Figure 2 shows a graphical representation of the research question and aims.

[----------INSERT FIGURE 2 HERE----------]

Methods

Dataset

To address the research questions, I use data collected by the Mississippi INBRE Outreach Scholars (MIOS) at the University of Southern Mississippi. The data were collected on residents in southeastern Mississippi and Louisiana, with the intent of gaining a better understanding of health behaviors among these residents. The data were collected via an online survey in the summer of 2020. The scholars reached out via social media (Twitter, Facebook, Instagram) to ask for participation. The requirements for the survey were that the participants were Mississippi or Louisiana residents, 18 years or older, and reported to have lived in the any

county listed, which were counties within the southeastern region of the states. Only those who responded, fit the criteria, and contacted the scholar directly and had shown interest were given the survey link so that they could fill it out. Participants were compensated with a $5 gift card from Walmart. The complete survey is presented in Appendix 4.

Variables

Dependent Variables

I analyze 3 primary dependent variables: physical health status, healthy dietary intake, and unhealthy dietary intake. All variables are self-reported by respondents. I assessed physical health status using the question, "In general, would you say your physical health is…" Response categories were excellent, very good, good, fair, and poor. The response categories are coded such that a higher score indicates higher ranking of health status. For the dietary intake variables, respondents reported how often they ate or drank an item in question in the past month. This was taken from the National Cancer Institute's Dietary Screening Questionnaire, where respondents answered numerous questions regarding their dietary intake whether that was grain, sugar, or even fruits and vegetables (National Cancer Institute 2009). Questions were comprehensive such as ones about fruit/vegetable intakes which asked not just about fresh fruits/vegetables intake, but dried fruits/vegetables intake, and canned fruits/vegetables intake. The respondent then answered the amount of quantity they had each dietary intake as: Never, 1-time last month, 2-3 times last month, 1 time per week, 2 times per week, 3-4 times per week, 5-6 times per week, 1 time per day, 2-3 times per day, 4-5 times per day, or 6 or more times per day. These responses were used to estimate predicated intake based on the respondents age, gender, race, and dietary intake amount for each type of item. Each dietary intake had different intake equivalents ranging from cups to teaspoons, to ounces and to grams and milligrams. The variables were standardized

before combining into the index (National Cancer Institute 2009). The dependent variable for healthy dietary intake measured fruits/vegetables, fiber, and whole grain intake. The dependent variable for unhealthy dietary intake measured sugar consumption.

Independent Variable

To measure the variable fatalism, I created a means index variable using the following survey items that focused on fatalism with respect to diabetes:

1. Maintaining a healthy weight can help prevent diseases like diabetes. (reversed)
2. Getting a disease like diabetes is within my control. (reversed)
3. Diseases like diabetes can be prevented. (reversed)

There were seven response categories ranging from strongly disagree (1) to strongly agree (7). Responses were averaged across the seven items so that if any item had a missing value, it did not affect the average. The variables were reverse coded so that a higher score indicated a higher degree of fatalism. The Cronbach's alpha coefficient for items in the index is 0.75. Descriptive statistics for the individual index items are presented in Appendix 2.

External Variables

The three external variables are community health perception, social support, and religiosity. Community health perceptions are measured using a summed index of the following survey items:

1. People in my community think eating healthy is a part of our culture.
2. The diets of people in my community usually have lots of fruits and vegetables.
3. People in my community think being active is part of our culture.

There were seven response categories ranging from strongly disagree to strongly disagree. The categories were coded so that a higher score represents more agreement. Some of the variables were reverse coded so the direction was consistent with higher agreement. The Cronbach's alpha coefficient for items in the community health perceptions index is 0.78. Descriptive statistics for the individual index items are presented in Appendix 2.

The variable social support is measured using a summed index of the following survey items:

1. When I am trying to eat better or be more active, I have a friend that cares about how I am doing with my goals.
2. When I am trying to eat better or be more active, I have a friend that I can connect with that is trying to do the same thing as me.
3. When I am trying to eat better or be more active, I have a friend who helps me problem solve.
4. When I am trying to eat better or be more active, I have a friend who encourages me to meet my goal(s).

There were seven response categories ranging from strongly disagree to strongly disagree. The categories were coded so that a higher score represents more agreement. The Cronbach's alpha coefficient for items in the social support index is 0.96. Descriptive statistics for the individual index items are presented in Appendix 2.

The final external variable, religiosity, is measured from a single item. Respondents were asked, "How religious/spiritual would you say you are?" The response categories were not religious at all, not too religious, fairly religious, and very religious. A higher score reflects a higher level of religiosity. Descriptive statistics for the religiosity variable are presented in Appendix 2.

Control Variables

I control for several individual-level socio-demographic variables in the multivariate models. Gender is a binary variable indicating if the respondent is male; females are the referent category in the analyses. Race is a categorical variable. Respondents selected from the following race/ethnicity categories: white, black/African-American, Hispanic or Latino, Asian, American Indian/Alaskan Native, Native Hawaiian or other Pacific Islander. The categories were collapsed into four categories, white, black, indigenous, and other. The referent category in the multivariate analyses are white respondents. Disease status is also included as a control variable. The variable is binary and indicates whether the respondent has been diagnosed with any preventable disease, such as obesity, kidney disease, heart disease, high blood pressure, diabetes, and COVID-19. Those who have been diagnosed with a disease are the reference group. Income is a categorical variable. The categories range from less than $20,000 to more than $140,000. I recoded the variable into three categories: low, middle, and high income based on average incomes in the study region (Hubbard 2020). Low income encompasses $0 to $19,999, middle income is $20,000 to $99,999, and high income is defined as $100,000 or greater. Note that the variable is annual individual income, rather than household income. Education is a categorical variable with the following categories: less than a high school degree, high school degree, some college, but not a college degree, 2-year or vocational degree, and 4-year college degree or higher. Finally, age is a continuous variable, ranging from 18 to 79.

Analysis

For the dependent variable physical health status, I present findings from ordinal regression analyses. For the dietary intake variables (healthy and unhealthy intake), I present findings from OLS regression analyses. For each dependent variable, I present the findings in a three-model format starting with a bivariate model showing the unadjusted relationship between

fatalism and the dependent variable. Each successive model adds a set of variables—control variables, and the external variables. Before presenting the results from the regression analyses, I present basic descriptive statistics for the study sample and the key independent and dependent variables.

Results

Description of the Study Sample and Study Variables

Table 1 shows the frequencies and percentages for variables describing the study sample. The sample is largely female (73.2 percent). The sample is relatively diverse in terms of race. About one-third of the sample self-reported their race as white (33.9 percent). Likewise, a third reported their race as "indigenous" (33.9 percent). About a quarter of the sample identified as "black" (25.2 percent). The remaining 7 percent self-identified as "other" race. Slightly less than one-half (44.5 percent) reported having been diagnosed with any preventable disease including heart disease, obesity, diabetes, kidney disease, high blood pressure, and COVID-19. The study group is relatively young (mean age = 33.2). The study group is relatively well educated, over 95 percent have a high school degree or higher. Over a third (36.4 percent) have a 4-year college degree. The income level for sample is quite low. Just under half of the respondents report an annual individual income less than $20,000. More than two-thirds of the sample report an annual individual income less than $40,000. The low income is likely related to the relatively young age of the study group. Given the age of respondents, it is feasible that some are still in school or just out of school.

[----------INSERT TABLE 1 HERE----------]

Table 2 presents basic statistics for the dependent variables, the independent variable, fatalism, and external variables. Physical health had a mean of 3.31 with a standard deviation (SD) of 0.97 in which the answers range from 1 through 5. The dietary intakes were created with a combination of variables becoming a predictive index. Fruit/Vegetable (Cups) had a mean of 1.93 with an SD of 0.74 and range of 1.04 through 5.30, Fiber (grams) had a mean of 14.38 with an SD of 3.15 and range of 5.08 through 27.06, Sugar (teaspoons) had a mean of 18.17 with an SD of 18.17 and range of 9.99 through 76.92, and whole grain (ounces) had a mean of 0.60 with an SD of 0.30 and range of .30 through 2.87. The main independent variable, fatalism, has a mean of 2.87 and ranges from 1 to 5.14 with a standard deviation of 0.95. The external variable community health perception has a mean of 3.90 and range of 1 to 7 with an SD of 1.01, social support has a mean of 3.90, range of 1 to 5 with an SD of 1.05, and religiosity has a mean of 2.91, range of 1 to 4 with an SD of 0.98.

[----------INSERT TABLE 2 HERE----------]

Fatalism and Health Outcomes and Behaviors

Table 3 shows the results from the models predicting self-reported physical health status. Model 1 is the bivariate (unadjusted) model. Models 2 and 3 include control variables and the substantive variables external to the health belief model, respectively. The odds ratios for fatalism are essentially 1.0 in each of the models and are not statistically significant. Of the control variables, disease status and education are inversely related to physical health status. Predictably, the presence of disease is associated with lower odds of reported physical health status. The odds ratios are 0.31 ($p<.001$) and 0.34 ($p<.001$) in both Models 2 and 3, respectively. Similarly, low education level (less than a high school degree) is associated with lower levels of physical health status. The odds ratios are 0.37 ($p<.05$) and 0.36 ($p<.05$) in Models 2 and 3,

respectively. In the full model (Model 3), gender is significantly associated with health status. Females have lower odds of physical health than males (OR=0.62, p<.05). Two of the external variables are statistically related to physical health status. Social support (OR=1.89, p<.001) and religiosity (OR=1.27, p<.05) both are associated with higher odds of better health status. As social support and religiosity increase so does reported health status.

[----------INSERT TABLE 3 HERE----------]

Table 4 presents the same series of regression models for the healthy dietary intake outcome variable. The results are from OLS regression models rather than ordinal regression models. Like the previous analyses, the impact of fatalism is negligible. The coefficients for fatalism are essentially zero; they range from 0.05 to 0.09. None of the coefficients are statistically significant. The only control variable that has a statistically significant impact on health dietary intake is gender. Net of the other variables in the models, females report lower levels of health dietary intake than men in both Models 2 and 3, b = -1.88, p<.001 and -1.83, p<.001, respectively. None of the external variables are statistically significant. In fact, the coefficients are near-zero for all three variables.

[----------INSERT TABLE 4 HERE----------]

Table 5 shows the regression results for the third outcome variable, unhealthy dietary intake. Like the previous models, the effects of fatalism are negligible and are not statistically significant. Although the effects of fatalism on unhealthy dietary intake are not statistically significant, it is noteworthy that the direction of the coefficients is negative, that is, higher fatalism is associated with lower levels of unhealthy dietary intake (again, however, these

coefficients are not statistically significant). Several control variables are related to unhealthy dietary intake. Females report lower levels of unhealth dietary intake ($b = -2.34$, $p<.05$ and -2.28, $p<.05$ in Models 2 and 3, respectively). Income, too, is negatively associated with unhealthy dietary intake. The regression coefficients in both Models 2 and 3 are -6.63 ($p<.01$) and -6.36 ($p<.01$), respectively. Education level is associated with sugar intake. Compared to the reference group (4-year college degree), those with less than a high school degree, or a high school degree or a 2-year degree report higher levels of unhealthy dietary intake. Finally, age is inversely related to sugar intake. As age increases, unhealthy dietary intake decreases. None of the external variables are statistically related to unhealthy dietary intake.

[----------INSERT TABLE 5 HERE----------]

Discussion

The aim of this study was to assess the relationship between fatalism and health-related behaviors and outcomes and whether that relationship is altered by community health perceptions, social support, and religiosity. The findings presented above provide no evidence that fatalism is related to the outcomes examined. There is also little to no evidence that the fatalism-health outcome relationship is altered by the external variables considered in the analyses.

Several factors may account for these null findings. First, it may be the case that the study sample is unique in unforeseen ways. Certainly, the geographical location—southeastern Mississippi and Louisiana—is unique. The data are not nationally representative and may not be representative of the study region. The data were collected at the height of the COVID-19

pandemic (Summer 2020). Previous research studies in the area by the Mississippi INBRE Outreach Scholars netted much larger samples. Also related to the study sample, is the age of the respondents. The respondents are quite young (mean age = 33.2). Younger people are generally healthier than older people and thus less aware of or concerned with health-related matters (Goodyear, Armour, and Wood 2019).

Another possible explanation is the measurement of the key variables. Several of the variables are related specifically to chronic and long-term diseases. The fatalism measure used, for example, asks questions specifically about diabetes, rather than the ability to effect change in health more generally. The focus on a potentially preventable disease coupled with the young study sample certainly may have contributed to the lack of findings.

Given the limitations of the data and the unexpected findings, future studies should focus on refining measures appropriate to the study population. The study results point to ways to refine the assessment of fatalism on health-related behaviors. Future studies should consider the relationship between the specific measures of health-related outcomes and behaviors with the study sample. While diabetes- and other chronic disease-related behaviors are “appropriate” for middle aged or older adults, they are less “appropriate” for young people.

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Appendix 1: Tables of Results

Table 1. Demographic Characteristics of the MIOS Study Sample

Variable	Mean	Std Deviation
Age	33.5	13.9
Variable	**Frequency**	**Percent**
Sex		
Men	137	26.81
Women	374	73.19
Race		
White	173	33.86
Black	129	25.24
Indigenous	173	33.86
Other	36	7.05
Disease Status		
No	272	55.51
Yes	218	44.49
Education		
Less than HS	24	4.70
HS Degree	76	14.87
Some College	132	25.83
2-year or Vocational	93	18.20
4 Years or More	186	36.40
Income		
Low	221	43.25
Middle	268	52.45
High	22	4.31

Table 2. Descriptive Statistics for Key Study Variables

Variable	Mean	Std Dev
Dependent Variables		
Physical Health	3.31	0.97
Fiber Intake	14.38	3.15
Sugar Intake	18.17	9.55
Fruit/Vegetable Intake	1.93	0.74
Whole Grain Intake	0.60	0.30
Independent Variable		
Fatalism	2.87	0.95
Variables External to HBM		
Community Health Perceptions	3.90	1.01
Social Support	3.69	1.05
Religiosity	2.91	0.89

Table 3. Ordered Logistic Regression Results for Physical Health.

Variable	Model 1	Model 2	Model 3
	OR	OR	OR
Fatalism	1.08	1.03	0.99
Gender (ref = Male)		0.76	0.62*
Race (ref = White)			
Black		0.89	0.88
Indigenous		0.76	0.95
Other		1.11	1.57
Disease Status (ref=No)		0.31***	0.34***
Income (ref=High Income)			
Low Income		0.60	0.53
Middle Income		0.56	0.50
Education (ref=College Degree)			
< HS Degree		0.37*	0.36*
HS Degree		0.61	0.63
Some College		0.88	0.91
2-Year or Vo-Tech Degree		0.69	0.65
Age		1.00	0.99
Community Health Perception			1.09
Support			1.89***
Religiosity			1.27*
N	462	462	462
AIC	1276.4	1243.9	1186.0
BIC	1297.1	1314.2	1268.7

Table 4. OLS Regression Result for Healthy Dietary Intake (High Fruits/Vegetables, Fiber, & Whole Grain Intake)

Variable	Model 1	Model 2	Model 3
Fatalism	0.09	0.07	0.05
Gender (ref = Male)		-1.88***	-1.83***
Race (ref = White)			
Black		0.30	0.37
Indigenous		0.01	0.08
Other		0.69	0.70
Disease Status (ref=No)		-0.21	-0.16
Income (ref=High Income)			
Low Income		-0.21	-0.19
Middle Income		-0.44	-0.35
Education (ref=College Degree)			
< HS Degree		-0.70	-0.71
HS Degree		-0.58	-0.59
Some College		0.15	0.15
2-Year or Vo-Tech Degree		-0.59	-0.65
Age		0.01	0.01
Community Health Perception			0.16
Support			0.01
Religiosity			0.00
N	451	451	451
R^2	0.002	0.136	0.143

Table 5. OLS Regression Result for Unhealthy Dietary Intake (High Sugar Intake)

Variable	Model 1	Model 2	Model 3
Fatalism	-0.63	-0.22	-0.15
Gender (ref = Male)		-2.34*	-2.28*
Race (ref = White)			
Black		-0.30	-0.31
Indigenous		2.77*	2.18*
Other		-0.59	-0.96
Disease Status (ref=No)		1.14	0.70
Income (ref=High Income)			
Low Income		-6.63**	-6.36**
Middle Income		-3.90	-4.11
Education (ref=College Degree)			
< HS Degree		5.72*	5.54*
HS Degree		4.25**	4.14**
Some College		1.14	1.15
2-Year or Vo-Tech Degree		3.03*	3.28*
Age		-0.16***	-0.13**
Community Health Perception			-0.56
Support			-0.41
Religiosity			-0.99
N	451	451	451
R^2	0.008	0.115	0.133

Appendix 2: Summary and Descriptive Statistics for the Independent and External HBM Variables

Table 6. Fatalism Index Variable (Cronbach's Alpha= 0.75)

Question	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Maintaining a healthy weight can help prevent diseases like diabetes. *(reversed)*	4.68	2.98	2.77	4.04	12.55	30.21	42.77
Getting a disease like diabetes is within my control. *(reversed)*	5.11	5.11	9.79	14.26	26.17	20.21	19.36
Diseases like diabetes can be prevented. *(reversed)*	4.47	5.53	8.09	11.91	23.62	22.98	23.40

Table 7. Community Health Perception Index Variable (Cronbach's Alpha= 0.78)

Question	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
People in my community think eating healthy is a part of our culture.	15.95	23.06	16.38	21.98	11.64	7.76	3.23
The diets of people in my community usually have lots of fruits and vegetables.	14.87	19.18	19.61	19.83	16.59	4.09	4.82
People in my community think being active is part of our culture.	6.90	13.15	12.28	23.92	24.35	11.64	7.76

Table 8. Social Support Index Variable (Cronbach's Alpha= 0.96)

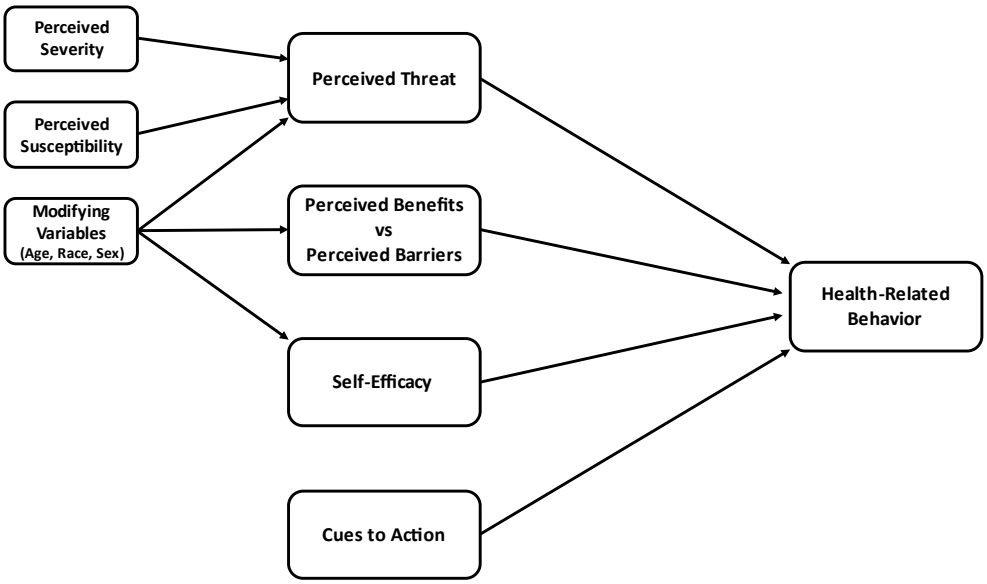
Question	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
When I am trying to eat better or be more active, I have a friend that cares about how I am doing with my goals.	3.06	5.24	3.49	9.61	19.65	32.97	25.98
When I am trying to eat better or be more active, I have a friend that I can connect with that is trying to do the same thing as me.	3.71	6.11	2.62	10.70	17.90	34.28	24.67
When I am trying to eat better or be more active, I have a friend who helps me problem solve.	3.49	6.11	4.15	11.79	18.34	33.19	22.93
When I am trying to eat better or be more active, I have a friend who encourages me to meet my goal(s).	3.49	4.80	3.71	9.61	15.94	36.90	25.55

Table 9. Religiosity Variable

Question	Not Religious at All	Not Too Religious	Fairly Religious	Very Religious
How religious/spiritual would you say you are?	8.48	19.19	45.66	26.67

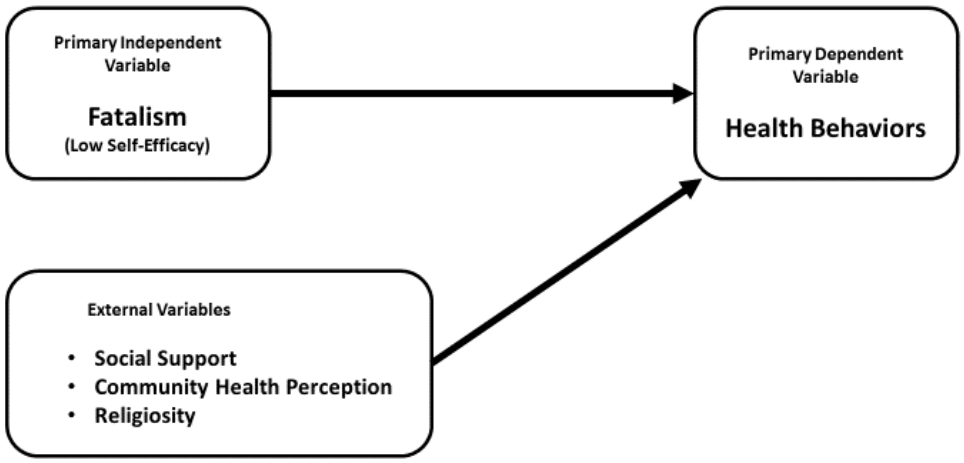
Appendix 3: Figures

Figure 1. The Health Belief Model



Source: Rosenstock et al. 1988. "Social Learning Theory and the Health Belief Model."

Figure 2. Visual Representation of the Research Aims



Appendix 4: Questionnaire

Mississippi INBRE Outreach Scholars (MIOS)

Survey of Health Behaviors of Southeastern Mississippi and Louisiana

Summer 2020

Q1 What state do you currently live in?

- ○ Louisiana
- ○ Mississippi
- ○ Another state

Q2 What is your age?

Q3 What is your gender?

- ○ Male
- ○ Female

Q4 Which of the following would you say is your race/ethnicity? Check all that apply.

- ☐ White
- ☐ Black or African American
- ☐ Hispanic or Latino
- ☐ Asian
- ☐ American Indian or Alaskan Native
- ☐ Native Hawaiian or other Pacific Islander

Q5 Are you currently an enrolled member of a tribe?

- ○ Yes
- ○ No

Q6 Please indicate the highest level of education you have received.

- ○ Less than a high school degree
- ○ A high school degree
- ○ Some college, but not a college degree
- ○ A 2 year or vocational degree
- ○ A 4 year college degree or higher

Q165 Please select the best statement that describes your current employment status.

I do not work and am not looking for work.

I do not work but I am looking for work.

I do not work but I stay at home to care for children or elderly family members.

I do not work because I am retired.

I have a full-time position.

I have a part time position

I have more than one part time position.

I am a student and work part or full time.

I am a student and do not work.

Q7 What is your current **individual** yearly net income level?
In other words, about how much money do you bring home each year?

- ○ $0 to $19,999
- ○ $20,000 to $29,999
- ○ $30,000 to $39,999
- ○ $40,000 to $49,999
- ○ $50,000 to $59,999
- ○ $60,000 to $69,999
- ○ $70,000 to $79,999
- ○ $80,000 to $99,999

- ○ $100,000 to $119,999 (10)
- ○ $120,000 to $139,999 (11)
- ○ $140,000 or greater (12)

Q170 What is your **household** current yearly net income level?
In other words, think about each person that pays the bills and contributes to household expenses. If you add up what each of those people make, about how much money is brought home each year?

- ○ $0 to $19,999
- ○ $20,000 to $29,999
- ○ $30,000 to $39,999
- ○ $40,000 to $49,999
- ○ $50,000 to $59,999
- ○ $60,000 to $69,999
- ○ $70,000 to $79,999
- ○ $80,000 to $99,999
- ○ $100,000 to $119,999 (10)
- ○ $120,000 to $139,999 (11)
- ○ $140,000 or greater (12)

Q171 How many people contribute to your household income?

Q8 What is your current marital status?

- ○ Single
- ○ Married
- ○ Cohabitating (living with significant other, but not married)
- ○ Divorced
- ○ Separated

Q166 How many adults (18+ years), including yourself, live in your household?

Q168 How many children live in your household?

Q9 What best describes the type of health insurance you have?

- ○ Private insurance
- ○ Insurance provided by your employer
- ○ Medicaid or Medicare
- ○ Tribal health insurance
- ○ Military insurance (Tri-care, etc.)
- ○ Insurance through the Affordable Care Act (Obamacare)
- ○ I don't have insurance of any kind

Q10 What is your religious affiliation?

- ○ Baptist
- ○ Catholic
- ○ Methodist
- ○ Non-Denominational
- ○ Presbyterian
- ○ Other _____
- ○ I do not have a religious affiliation
- ○ Prefer not to respond (99)

Q11 How often do you attend church or religious services?

- ○ Never
- ○ Less than once a year
- ○ A few times a year
- ○ A few times a month
- ○ At least once a week
- ○ More than once a week

Q12 How religious/spiritual would you say you are?

- ○ Not religious at all
- ○ Not too religious
- ○ Fairly religious
- ○ Very religious

Q13 In general, would you say your PHYSICAL health is:

- ○ Excellent
- ○ Very Good
- ○ Good
- ○ Fair
- ○ Poor

Q14 How often do you get the social and emotional support you need?

- ○ Always
- ○ Usually
- ○ Sometimes
- ○ Rarely
- ○ Never

Q15 Has a doctor, nurse or other health professional EVER told **YOU, AN** ADULT (18+), OR A **C**HILD (UNDER 18) IN YOUR HOME that you have the following diseases or health conditions?

	Do YOU have the following?			Does an ADULT (18+) in your home have the following?			Does a CHILD (under 18) in your home have the following?		
	Yes	No	Don't Know	Yes	No	Don't Know	Yes	No	Don't Know
Diabetes	○	○	○	○	○	○	○	○	○
Obesity	○	○	○	○	○	○	○	○	○
High blood pressure	○	○	○	○	○	○	○	○	○
Heart disease, attack or stroke	○	○	○	○	○	○	○	○	○
Kidney dysfunction or disease	○	○	○	○	○	○	○	○	○
Lung Disease	○	○	○	○	○	○	○	○	○
Asthma (16)	○	○	○	○	○	○	○	○	○
Liver disease (17)	○	○	○	○	○	○	○	○	○
HIV/AIDS (18)	○	○	○	○	○	○	○	○	○

Q16 Does/did anyone in your immediate family (mother, father, sister, brother) have any of the following health issues?

	Yes	No	Don't Know
Diabetes	○	○	○
Obesity	○	○	○
High Blood Pressure	○	○	○
Heart disease, attack or stroke	○	○	○
Kidney dysfunction or disease	○	○	○
COVID19	○	○	○

Q17 Have you been a non-smoker for more than 12 months?

- ○ Yes
- ○ No

COVID_1 **Between January 2020 and now**, have you been sick for more than one day with an illness that included any of the following: fever, cough, sore throat, or runny or stuffy nose?

Check all that apply.

- ☐ A fever/feverish
- ☐ Cough
- ☐ Sore throat
- ☐ Runny or stuffy nose
- ☐ Difficulty breathing
- ☐ I have not experienced any of these symptoms between January 2020 and now.

COVID_2 Did you see a healthcare professional or go anywhere to check on these symptoms?

- ○ Yes
- ○ No

COVID_2A For these symptoms, where did you go to see a healthcare professional?

Doctor's office

Telemedicine/telephone triage

Urgent care center

Emergency room at a hospital

Health department/public health clinic

Tribal health center

Pharmacy

If you went somewhere else not listed, please specify here.

COVID_3 For these symptoms, were you tested for COVID-19?

- ○ Yes
- ○ No
- ○ Don't know

COVID_3A Was your COVID-19 test positive?

- ○ Yes
- ○ No
- ○ Don't know

COVID_4 For these symptoms, were you tested for the flu/influenza?

- ○ Yes
- ○ No
- ○ Don't Know

COVID_4A Was your flu/influenza test positive?

- ○ Yes
- ○ No
- ○ Don't know

COVID_2B Select the reason(s) you did not see a health care professional for those symptoms.

- I did not feel bad enough.
- I distrust the healthcare system.
- I did not have insurance.
- I was worried about how much it would cost.
- I did not want to spend the money.
- I did not have paid sick leave.
- There was no one to look after my family.
- Please specify any other reason not listed above.

COVID_5 Have you received an antibody test for COVID19?

- ○ Yes
- ○ No
- ○ Don't Know

COVID_5A Was your antibody test positive for COVID19?

- ○ Yes
- ○ No
- ○ Don't Know

COVID6 Whether you were tested or not, do you believe that you had COVID19?

- ○ Yes
- ○ Maybe
- ○ No

Q19 **Your Thoughts on Chronic Disease Prevention**

Please choose your level of agreement with the following statements.

	Choose One						
	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Eating better will not prevent me from getting a disease like diabetes.	○	○	○	○	○	○	○
Maintaining a healthy weight can help prevent diseases like diabetes.	○	○	○	○	○	○	○
Getting a disease like diabetes is	○	○	○	○	○	○	○

within my control.							
If I get a disease like diabetes, I am destined to have it.	○	○	○	○	○	○	○
I do not worry about diseases like diabetes because they are not in my control.	○	○	○	○	○	○	○
Diseases like diabetes can be prevented.	○	○	○	○	○	○	○
Being more active will not prevent me from getting a disease like diabetes.	○	○	○	○	○	○	○

Q20

Your Thoughts on Norms/Values of Health in Your Community

Please choose your level of agreement with the following statements.

	Choose One						
	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
It is normal for people in my community to have a disease like diabetes.	○	○	○	○	○	○	○
People in my community think eating healthy is a part of our culture.	○	○	○	○	○	○	○
The diets of people in my community usually have lots of fruits and vegetables.	○	○	○	○	○	○	○
Having a disease like diabetes is part of being a member of my community.	○	○	○	○	○	○	○
People in my community think being active is part of our culture.	○	○	○	○	○	○	○

Valid1 Let us know you are a real person by selecting "yes."

- ○ Yes
- ○ Maybe
- ○ No

Q21 **Informational Support to Eat Better and Move More**

Please choose your level of agreement with the following statements.

	Choose One						
	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
When I need information to help me eat better or move more, I have a friend who I can turn to for information.	○	○	○	○	○	○	○
When I need information to help me eat better or move more, I have a friend who will help me get the information I need.	○	○	○	○	○	○	○
When I need information to help me eat better or move	○	○	○	○	○	○	○

more, I have a friend who will give me ideas/things to try.	

Q22 **Emotional Support to Eat Better and Move More**

Please choose your level of agreement with the following statements.

	Choose One						
	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
When I am trying to eat better or be more active, I have a friend that cares about how I am doing with my goals.	○	○	○	○	○	○	○
When I am trying to eat better or be more active, I have a friend that I can connect with that is trying to do the same thing as me.	○	○	○	○	○	○	○
When I am trying to eat better or be more active, I have a friend who helps me	○	○	○	○	○	○	○

problem solve.							
When I am trying to eat better or be more active, I have a friend who encourages me to meet my goal(s).	○	○	○	○	○	○	○

Q23 **Encouragement to Eat Better and Move More**

Please choose your level of agreement with the following statements.

	Choose One						
	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
When I meet my goals to eat better or be more active, I have a friend that I can share my success with.	○	○	○	○	○	○	○
When I meet my goals to eat better or be more active, I have a friend who will celebrate my achievements with me.	○	○	○	○	○	○	○
When I meet my goals to eat better or be more active, I have a friend who will be proud of me.	○	○	○	○	○	○	○

DSQ_010 During the past month, how often did you eat **hot or cold cereals**?
Mark one

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_020 During the past month, what kind of cereal did you usually eat? *Type cereal.*

_____

DSQ_xx3 If there was another kind of cereal that you usually ate during the past month, what kind was it? *Type cereal, if none leave blank*

_____

DSQ_030 During the past month, how often did you have any **milk** (either to drink or on cereal)?
Include regular milks, chocolate or other flavored milks, lactose-free milk, buttermilk.
Please do **not** include soy milk or small amounts of milk in coffee or tea.
Mark one

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week

- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2-3 times per day
- ○ 4-5 times per day (10)
- ○ 6 or more times per day (11)

DSQ_xx4 During the past month, what kind of milk did you usually drink?
Mark one

- ○ Whole or regular milk
- ○ 2% or reduced-fat milk
- ○ 1%, 1/2%, or low fat milk
- ○ Fat-free, skim or nonfat milk
- ○ Soy milk
- ○ Other kind of milk

DSQ_xx4os During the past month, what kind of milk did you usually drink? Other Specify

_____

DSQ_040 During the past month, how often did you drink **regular soda or pop** that contains sugar?
Do **not** include diet soda.
Mark one

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day

- ○ 2-3 times per day
- ○ 4-5 times per day (10)
- ○ 6 or more times per day (11)

DSQ_050 During the past month, how often did you drink **100% pure fruit juices** such as orange, mango, apple, grape and pineapple juices?
Do **not** include fruit-flavored drinks with added sugar or fruit juice you made at home and added sugar to.
Mark one

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2-3 times per day
- ○ 4-5 times per day (10)
- ○ 6 or more times per day (11)

DSQ_060 During the past month, how often did you drink coffee or tea that had **sugar** or **honey** added to it?
Include coffee and tea you sweetened yourself and presweetened tea and coffee drinks such as Arizona Iced Tea and Frappuccino.
Do **not** include artificially sweetened coffee or diet tea.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week

- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2-3 times per day
- ○ 4-5 times per day (10)
- ○ 6 or more times per day (11)

DSQ_070 During the past month, how often did you drink **sweetened** fruit drinks, sports or energy drinks, such as Kool-Aid, lemonade, Hi-C, cranberry drink, Gatorade, Red Bull or Vitamin Water?
Include fruit juices you made at home and added sugar to.
Do **not** include diet drinks or artificially sweetened drinks.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2-3 times per day
- ○ 4-5 times per day (10)
- ○ 6 or more times per day (11)

DSQ_080 During the past month, how often did you eat **fruit**? Include fresh, frozen or canned fruit. Do **not** include juices.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week

- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

Valid2 Let us know you are a real person by selecting "yes."

- ○ Yes
- ○ Maybe
- ○ No

DSQ_090 During the past month, how often did you eat a green leafy or lettuce **salad**, with or without other vegetables?

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_100 During the past month, how often did you eat any kind of **fried potatoes**, including French fries, home fries, or hash brown potatoes?

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week

- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_110 During the past month, how often did you eat any **other kind of potatoes**, such as baked, boiled, mashed potatoes, sweet potatoes, or potato salad?

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_120 During the past month, how often did you eat refried beans, baked beans, beans in soup, pork and beans or any other type of cooked dried beans?
Do **not** include green beans.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_210 During the past month, how often did you eat **brown rice** or other cooked whole grains, such as bulgur, cracked wheat, or millet?
Do **not** include white rice.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_130 During the past month, not including what you just told me about (green salads, potatoes, cooked dried beans), how often did you eat **other vegetables**?

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_150 During the past month, how often did you have Mexican-type **salsa** made with tomato?

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month

- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_140 During the past month, how often did you eat **pizza**?
Include frozen pizza, fast food pizza, and homemade pizza.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_160 During the past month, how often did you have **tomato sauces** such as with spagetti or noodles or mixed into foods such as lasagna?
Do not include tomato sauce on pizza.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_190 During the past month, how often did you eat any kind of cheese?
Include cheese as a snack, cheese on burgers, sandwiches, and cheese in foods such as lasagna, quesadillas, or casseroles.
Do not include cheese on pizza.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_170 During the past month, how often did you eat **red meat**, such as beef, pork, ham, or sausage?
Do **not** include chicken, turkey or seafood.
Include red meat you had in sandwiches, lasagna, stew, and other mixtures. Red meats may also include veal, lamb, and any lunch meats made with these meats.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_180 During the past month, how often did you eat any **processed meat**, such as bacon, lunch meats, or hot dogs?
Include processed meats you had in sandwiches, soups, pizza, casseroles, and other mixtures. Processed meats are those preserved by smoking, curing, or salting, or by the addition of preservatives. Examples are: ham, bacon, pastrami, salami, sausages, bratwursts, frankfurters, hot dogs, and spam.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_200 During the past month, how often did you eat **whole grain bread** including toast, rolls and in sandwiches?
Whole grain breads include whole wheat, rye, oatmeal and pumpernickel.
Do **not** include white bread.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_220 During the past month, how often did you eat **chocolate** or any other types of candy? Do **not** include sugar-free candy.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_230 During the past month, how often did you eat **doughnuts**, sweet rolls, Danish, muffins, pan dulce, or pop-tarts?
Do **not** include sugar-free items.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_240 During the past month, how often did you eat **cookies, cake, pie or brownies**? Do **not** include sugar-free kinds.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_250 During the past month, how often did you eat **ice cream or other frozen desserts**? Do **not** include sugar-free kinds.

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

DSQ_260 During the past month, how often did you eat **popcorn**?

- ○ Never
- ○ 1 time last month
- ○ 2-3 times last month
- ○ 1 time per week
- ○ 2 times per week
- ○ 3-4 times per week
- ○ 5-6 times per week
- ○ 1 time per day
- ○ 2 or more times per day

P2Q14aSweets	DSQ_010	During the past month, how often did you eat hot or cold cereals? Mark one
	DSQ_020	During the past month, what kind of cereal did you usually eat? Type cereal.
	DSQ_xx3	If there was another kind of cereal that you usually ate during the past month, what kind was it? Type cereal, if none leave blank
	DSQ_030	During the past month, how often did you have any milk (either to drink or on cereal)? Include regular milks, chocolate or other flavored milks, lactose-free milk, buttermilk. Please do not include soy milk or small amounts of milk in coffee or tea.
	DSQ_xx4	During the past month, what kind of milk did you usually drink? Mark one
	DSQ_xx4os	During the past month, what kind of milk did you usually drink? Other Specify
P3Q14bSweets P3Q14bSweetenedBev	DSQ_040	During the past month, how often did you drink regular soda or pop that contains sugar? Do not include diet soda. Mark one
	DSQ_050	During the past month, how often did you drink 100% pure fruit juices such as orange, mango, apple, grape and pineapple juices? Do not include fruit-flavored drinks with added sugar or fruit juice you made at home and added sugar to. Mark one
P4Q14dSweets P4Q14dSweetenedBev	DSQ_060	During the past month, how often did you drink coffee or tea that had sugar or honey added to it? Include coffee and tea you sweetened yourself

		and presweetened tea and coffee drinks such as Arizona Iced Tea and Frappuccino. Do not include artificially
P5Q14eSweets P5Q14eSweetenedBev	DSQ_070	During the past month, how often did you drink sweetened fruit drinks, sports or energy drinks, such as Kool-Aid, lemonade, Hi-C, cranberry drink, Gatorade, Red Bull or Vitamin Water? Include fruit juices you made at home and added sugar to. Do not incl
P2Q14fFruitVeg	DSQ_080	During the past month, how often did you eat fruit? Include fresh, frozen or canned fruit. Do not include juices.
P3Q14gFruitVeg	DSQ_090	During the past month, how often did you eat a green leafy or lettuce salad, with or without other vegetables?
P4Q14hFruitVeg	DSQ_100	During the past month, how often did you eat any kind of fried potatoes, including French fries, home fries, or hash brown potatoes?
P5Q14iFruitVeg	DSQ_110	During the past month, how often did you eat any other kind of potatoes, such as baked, boiled, mashed potatoes, sweet potatoes, or potato salad?
P6Q14jFruitVeg	DSQ_120	During the past month, how often did you eat refried beans, baked beans, beans in soup, pork and beans or any other type of cooked dried beans? Do not include green beans.
Q14k	DSQ_210	During the past month, how often did you eat brown rice or other cooked whole grains, such as bulgur, cracked wheat, or millet? Do not include white rice.
P7Q14lFruitVeg	DSQ_130	During the past month, not including what you just told me about (green salads, potatoes, cooked dried beans), how often did you eat other vegetables?
Q14m	DSQ_150	During the past month, how often did you have Mexican-type salsa made with tomato?
	DSQ_140	During the past month, how often did you eat pizza? Include frozen pizza, fast food pizza, and homemade pizza.
Q14n	DSQ_160	During the past month, how often did you have tomato sauces such as with spagetti or noodles or mixed into foods such as lasagna? Do not include tomato sauce on pizza.
	DSQ_190	During the past month, how often did you eat any kind of cheese? Include cheese as a snack, cheese on burgers, sandwiches, and cheese in foods such as lasagna, quesadillas, or casseroles. Do not include cheese on pizza.
	DSQ_170	During the past month, how often did you eat red meat, such as beef, pork, ham, or sausage? Do

		not include chicken, turkey or seafood. Include red meat you had in sandwiches, lasagna, stew, and other mixtures. Red meats may also include veal, lamb, and
	DSQ_180	During the past month, how often did you eat any processed meat, such as bacon, lunch meats, or hot dogs? Include processed meats you had in sandwiches, soups, pizza, casseroles, and other mixtures. Processed meats are those preserved by smoking, curing.
Q14q	DSQ_200	During the past month, how often did you eat whole grain bread including toast, rolls and in sandwiches? Whole grain breads include whole wheat, rye, oatmeal and pumpernickel. Do not include white bread.
P6Q14rSweets	DSQ_220	During the past month, how often did you eat chocolate or any other types of candy? Do not include sugar-free candy.
P7Q14sSweets	DSQ_230	During the past month, how often did you eat doughnuts, sweet rolls, Danish, muffins, pan dulce, or pop-tarts? Do not include sugar-free items.
P8Q14tSweets	DSQ_240	During the past month, how often did you eat cookies, cake, pie or brownies? Do not include sugar-free kinds.
P9Q14uSweets	DSQ_250	During the past month, how often did you eat ice cream or other frozen desserts? Do not include sugar-free kinds.
Q14v	DSQ_260	During the past month, how often did you eat popcorn?

Q125 In the past week, how many days have you done a total of 30 minutes or more of physical activity that raised your breathing rate?

- ○ 0 days
- ○ 1 day
- ○ 2 days
- ○ 3 days
- ○ 4 days
- ○ 5 days
- ○ 6 days
- ○ 7 days

Q163
During the month of April 2020, have you ...

Select all that apply.

- Gone out to a restaurant, bar, club or other place where people gather?
- Visited with older friends, relatives or neighbors? Older =60 years old or older
- Gone to the grocery store or pharmacy?
- Gone to a friend, neighbor or relative's house (that is not your own)?
- Had more than 10 friends, neighbors or relatives over to your house for a gathering or meal?
- Gone to a family gathering where there were more than 10 people such as a reunion, wedding, funeral, birthday party?
- Gone to a gathering of friends where there were more than 10 people such as a party, wedding, or concert?
- Gone to a faith based gathering such as a church, synagogue, temple or mosque?

Valid3 Let us know you are a real person by selecting "yes."

- ○ Yes
- ○ Maybe
- ○ No

Q173 How has the COVID19 outbreak impacted your employment?

Select all that apply.

- I have not been employed during this time to be affected by COVID19.
- Worked remotely or from home more than I usually do
- Worked more hours than usual
- Worked reduced hours than usual
- Was not able to work
- Had difficulty arranging for childcare

Incurred increased costs for childcare expenses

Income or pay has been reduced

Not paid at all

Q177 Please rate your agreement with the following statements:

	Click to write Scale Point 1	Click to write Scale Point 2	Click to write Scale Point 3
I have a greater risk of COVID19 complications.	○	○	○
I live in a neighborhood where it is difficult to social distance myself from others.	○	○	○
It is easy for me to socially distance from family members in my home.	○	○	○
It is more important to be with my family than to socially distance from them.	○	○	○
It will help decrease the spread of COVID19 if I stay away from other people, including my family	○	○	○

Q53 Thank you for completing this survey! After you finish, you will be redirected to enter the gift card drawing.