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Social-Emotional Support as a Mediator of Household Structure and Mental Distress in Women

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Trisha Jeanine Walker

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Abstract

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by

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MS, Georgia College & State University, 2011

BS, North Georgia College & State University, 2007

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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Abstract

Mental illness affects more women than men in the United States. Poor mental health in reproductive-age women has negative implications on population health. The purpose of this quantitative, correlational study was to examine the relationship between household structure and frequency of mental distress, with consideration of the mediation social-emotional support provides for reproductive-age women. The social ecological model was the theoretical framework for this research, in which frequency of mental distress related to the individual-level of the human-environment interaction construct. Household structure and social-emotional support were examined at the relationship-level. Pearson's correlation coefficient and linear regression were used to conduct a cross-sectional analysis of the 2010 Behavioral Risk Factor Surveillance System data set with a total sample size of 65,269 women, 18–44 years old. The confounding variables, health care access, race, income, marital status, number of children in the household, and pregnancy status, were included in the analysis. Although social-emotional support significantly influenced both household structure and frequency of mental distress, significance was not found between household structure and frequency of mental distress indicating that mediation does not exist. This study provides researchers and practitioners information about household structure that should be considered when designing innovative, nonprofessional support programs at the community-level. Positive social change implications include an understanding of the relationship between complex variables associated with social-emotional support, which could improve community support programs focused on mental health wellness of reproductive-age women.

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Chapter 1: Introduction to the Study

Introduction

Small, Taft, and Brown (2011) defined nonprofessional support as social support from individuals outside of the health care environment. Nonprofessional support can include family members, friends, and members of the community. Nonprofessional support for reducing risk of mental illness in reproductive-age women needs further assessment to determine if unknown risk factors exist; program makers may be able to use this knowledge to develop or improve public health programs currently being used with this population. In this study, I viewed nonprofessional support as directly related to household structure and community outreach strategies that provide social-emotional support. I defined household structure as the number of men and women living in the home. The analysis of support relates to mental health, which includes an individual's "emotional, psychological, and social well-being" (Centers for Disease Control and Prevention [CDC], 2018, para. 2).

Social-emotional support is "defined as always or usually getting the social and emotional support needed" (Robbins et al., 2014, p. 12). Lack of social-emotional support may put reproductive-age women at risk for mental illness (Farr & Bish, 2013). Mental health affects individual stress management, relationships with others, and the ability to make healthy lifestyle decisions (CDC, 2018). The CDC defines mental illness as "conditions that affect a person's thinking, feeling, mood, or behavior, such as depression [and] anxiety" (para. 2). In this study, I used the variable, frequency of mental distress, to analyze mental health and risk for mental illness. In the analysis, I examined the

relationship between household structure and mental distress in reproductive-age women using social-emotional support as the mediator.

The relationship between household structure and mental distress has not been previously examined, according to my review of the literature. Such knowledge could be useful for health care practitioners, such as doctors and public health nurses, implementing nonprofessional support strategies for reproductive-age women with risk of mental illness. For example, obstetrician/gynecologists (OB/GYNs) who integrated the pregnancy support group, known as Centering Pregnancy, with their prenatal patients offer a trusting atmosphere for women to discuss challenges throughout and after pregnancy in a cohort with other pregnant women and their support network (Bell, 2012). Researchers have found that OB/GYNs' promotion of Centering Pregnancy helps to address prenatal challenges, including postpartum depression, and promotes a nonprofessional support network through building relationships in a cohort of people going through similar experiences (Bell, 2012; Hale, Picklesimer, Billings, & Covington-Kolb, 2014). Referral to a program using nonprofessional support by practitioners for women lacking social-emotional support in the home environment could lead to positive social change in communities. Farr and Bish (2013) emphasized that public health interventions should focus efforts in improving social support for women with frequent mental distress. In this study, my aim was to provide additional data to evaluate the inclusion of more nonprofessional support programs in communities that lack the innovative strategies needed to reach reproductive-age women at risk for mental illness.

It is important to first review the challenges associated with reproductive-age women's mental health in the United States. I begin the chapter by providing background information relating to reproductive-age women and mental health challenges. The problem statement follows with clarification of how the topic of reproductive-age women and mental health challenges relates to the problem being addressed in this study. I discuss the need for further research to determine the value of nonprofessional support methods as part of community-based intervention strategies. Next comes the purpose of the study; research questions with hypotheses; theoretical framework; nature of the study; definitions; and assumptions, scope and delimitations, and limitations of the study. I conclude the chapter by discussing the significance of the study and summarizing key points. An in-depth discussion of relevant and supporting literature is included in Chapter 2 and an overview of the research methodology in Chapter 3.

Background

Robbins et al. (2014) defined reproductive-age as 18–44 years old. Reproductive health includes the period before pregnancy, called preconception, and pregnancy-based health practices (Robbins et al., 2014). Preconception counseling, a type of social-emotional support, can be a method used by practitioners to promote positive mental health in reproductive-age women. Morgan, Anderson, Lawrence, and Schulkin (2012) found that more than 50% of OB/GYN patients had their initial contact with the OB/GYN in order to establish a pregnancy, eliminating their ability to conduct preconception health counseling and assess mental well-being. A trend analysis conducted by Bello, Rao, and Stulberg (2015) showed that despite emphasis from

multiple professional organizations on the value of family and reproductive health for preconception counseling during wellness visits, there was only a 4.5% increase in counseling by primary care physicians from 1998 to 2010. During that same period, Bello et al. found an increase from 9.5% to 14% in counseling involving discussion about contraceptives. The increase in preconception counseling was focused primarily on contraceptives and may not have been promoting mental well-being. The use of contraceptives by reproductive-age women illustrates the desire to prevent unintended pregnancies, which occurred at a rate of 45% in 2011 in the United States and cost more than $400 million (Guttmacher Institute, 2016).

Reproductive-age women in the United States can reduce unintended pregnancies because contraceptives are now included in their insurance plans (Atkins & Bradford, 2014), however, only two thirds of women at risk for unintended pregnancy use contraceptives appropriately (Guttmacher Institute, 2016). Owing to the higher rate of unintended pregnancies in low-income populations, 68% of these births were paid for by public insurance plans, such as Medicaid; only 38% of planned births were publicly funded (Guttmacher Institute, 2016). In 2006, the CDC placed increased emphasis on improvement in preconception and reproductive health (Robbins et al., 2014). Robbins et al. defined criteria relevant to practitioners as part of these efforts. Yet, in a trend analysis from 2003-2010, Xaverius and Salas (2013) found that challenges experienced by women with mental distress have not been adequately addressed.

Mental distress was defined by Xaverius and Salas using the same Behavioral Risk Factor Surveillance System (BRFSS) question I am using in this study for the

dependent variable, frequency of mental distress, as having 14 days or more per 30-day period with poor mental health, to include stress, depression, and problems controlling emotions. Women with mental illness are less reliable than those without mental illness in taking their prescribed contraceptives (Hall, Moreau, Trussell, & Barber, 2013) and thus are at higher risk for unintended pregnancies (Hall, Kusunoki, Gatny, & Barber, 2014, 2015a). In addition, women with unintended pregnancies have a higher risk for mental illness during pregnancy (Bayrampour, McDonald, & Tough, 2015). Mental illness during pregnancy leads to a higher risk of pregnancy complications and low birth weight (El-Mohandes, Kiely, Gantz, & El-Khorazaty, 2011; Witt, Wisk, Cheng, Hamption, & Hagen, 2012).

The factors associated with poor reproductive health continue to build upon one another for women with mental illness. Research shows, for instance, that reproductive-age women with mental illness have an increased tendency for binge drinking (Wen et al., 2012) and smoking cigarettes (Page, Padilla, & Hamilton, 2012). Public health researchers need to increase knowledge about the value of nonprofessional support in improving the social-emotional support network for reproductive-age women in order to build on current interventions integrating nonprofessional support methods in community programs.

Healthy relationships, identified as positive partner relations in which both parties are married or living together and demonstrating social-emotional support, play an integral part in mental health for reproductive-age women by reducing anxiety during pregnancy (Bayrampour et al., 2015), improving pregnancy outcomes (Witt et al., 2012),

and increasing housing stability (Allen et al., 2014). These relationships can be assessed by understanding household structure, which I define as the number of men and women living in the home. Reproductive-age women have varying degrees of social-emotional support through the relationships found in the household environment. The literature on the relationship between social support and mental health is extensive (see Bayrampour et al., 2015; Bell, 2012; Brownell, Chartier, Au, & Schultz, 2011; El-Mohandes et al., 2011; Farr & Bish, 2013; Hall, Steinberg, Cwiak, Allen, & Marcus, 2015b; Harelick, Viola, Tahara, 2011; Huot et al., 2013; Page et al., 2012; Price, Corder-Mabe, & Austin, 2012; Rosenthal et al., 2014; Small et al., 2011; Smith & Kruse-Austin, 2014; Taft et al., 2011; Tallman, 2016; Willet, Hayes, Zaha, & Fuddy, 2012; Witt et al., 2012; Xaverius & Salas, 2013); however, there is very little research on the specific topic of household structure in relation to mental distress (see Bloch et al., 2010; Molina & Alcantara, 2013; Schwarz et al., 2012).

In contrast to the benefits of living with a spouse or partner, Bloch et al. (2010) found an increase in depression and stress for unmarried low-income women with poor partner relationships. Molina and Alcantara (2013) found an improved mental state in women with children in the household, with an increase in mental distress for low-income families. In 2017, reproductive-age women in the United States had a poverty rate of 13.0%, which was 3.6% higher than men (Fontenot, Semega, & Kollar, 2018). The negative impact of low income may possibly be mitigated by household structure, specifically the number of adults living in the home. The adults living in the household may be composed of a spouse or partner, other family members, or friends. If the

household environment is unable to provide the social-emotional support needed, community programs could provide a means for intervention. Aside from the distinct role health care practitioners and household members play in promoting positive mental health (see Austin, Colton, Priest, Reilly, & Hadzi-Pavlovic, 2013; Bloch et al., 2010; Bloom, Bullock, & Parsons, 2012; Byatt et al., 2014; Hall et al., 2015b; Huot et al., 2013; Jarrett, 2015; Ko, Farr, Dietz, & Robbins, 2012; McCall-Hosenfeld, Weisman, Camacho, Hilemeier, & Chuang, 2012; Molina & Alcantara, 2013; Morgan et al., 2012; Price et al., 2012; Schwarz et al., 2012), reproductive-age women experiencing mental health challenges should have access to reliable community programs that meet their needs (see Allen, Feinberg, & Mitchell, 2014; Bignell, Sullivan, Sndrianos, & Anderson, 2013; Mead & Chapman, 2013; Brownell et al., 2011; Richards & Mousseau, 2012; Smith & Kruse-Austin, 2014; Stromback, Malmgren-Olsson, & Wiklund, 2013; Taft et al., 2011).

According to Taft et al. (2011), MOtherS' Advocates In the Community (MOSAIC), a program based in Australia, has used nonprofessional support as an intervention technique in cases of intimate partner violence and depression for women with children. Mothers from the local community provided social support through weekly home visitations for a year (Taft et al., 2011). Community health workers, a type of nonprofessional support, have been used in multiple settings to improve public health challenges, such as mental illness, by influencing healthy behaviors, such as providing culturally appropriate health information and increasing access to health services in minority and underserved populations (Smith & Kruse-Austin, 2014).

Public health practitioners have shown positive social impact by integrating nonprofessional support strategies into intervention programs. The nonprofessional support, community-based program called New Haven Mental Health Outreach for MotherS (MOMS) was developed by collaboration between six community agencies, academic support from the Yale Department of Psychiatry, and community-based participatory research (CBPR) with low-income mothers as participants (Smith & Kruse-Austin, 2014). The MOMS partnership consisted of academic and community collaboration to develop the training approach for nonprofessional support personnel, focusing specifically on mental health for pregnant and parenting women (Smith & Kruse-Austin, 2014). Although the sample size was small, Smith and Kruse-Austin (2014) found the use of nonprofessional support personnel, known as Community Mental Health Ambassadors (CMHAs), successful in changing reproductive-age women's views about mental health. Smith and Kruse-Austin (2014) were able to build a gender-informed model for future community-based mental health intervention efforts using nonprofessional support. A systematic review of community interventions in maternal health has shown the need to increase the use of theoretical constructs for providing measurement-linked evidence for interventions (Altman, Kuhlmann, & Galavotti, 2015).

I conducted this study to increase understanding of the role nonprofessional support provides for the mental well-being of reproductive-age women. An understanding of household structure's relationship to mental distress may provide relevant information about the need for nonprofessional support among reproductive-age women in environments lacking social-emotional support. This study was needed to

determine if nonprofessional support for mental distress exists in the household environment in order to determine its relevance as a risk indicator for intervention programs promoting positive mental health in reproductive-age women. If a significant relationship does exist, public health professionals could use this information to build upon existing research and design community programs that promote mental well-being for women through nonprofessional support techniques.

Problem Statement

Depression, anxiety, and frequent mental distress are forms of mental illness in reproductive-age women that continue to present challenges in the United States (CDC, 2018). Despite emphasis on mental health as a preconception health indicator for optimal reproductive health (Robbins et al., 2014), women are 2.5 times more likely than men to take antidepressants (Pratt, Brody, & Gu, 2011). For reproductive-age women with mental illness, more than half (58.6%) with major depressive disorder went undiagnosed, and only 53.7% of diagnosed women received treatment (Ko et al., 2012). Social support has been identified as the most prominent factor for improving mental health in women; in one study, 83.7% of reproductive-age women with good mental health had adequate social-emotional support compared to only 54.8% in women with poor mental health (Farr & Bish, 2013).

To improve mental illness in reproductive-age women, evidence is needed to promote the inclusion of nonprofessional support in intervention programs (Small et al., 2011). In this study, I examined household structure's role in frequency of mental distress. A quantitative correlational research design was used to examine relationships

between frequency of mental distress, household structure, and social-emotional support in reproductive-age women, where household structure was representative of nonprofessional support. An examination of the relationship between household structure and frequency of mental distress has not been previously conducted, according to my review of the literature. This information could be used by public health professionals to determine household structures that increase risk for mental illness and promote community-based interventions in the form of nonprofessional support.

Purpose of the Study

The purpose of this quantitative correlational study was to examine the relationship between household structure and frequency of mental distress, with consideration of the mediation social-emotional support provides. If a relationship did exist, quantitative analysis using data from the BRFSS could help to determine which type of household structure provides the best source of social-emotional support. Findings from such an analysis could also highlight which type of household may be a risk indicator for nonprofessional support programs focused on reducing mental illness in reproductive-age women in the United States. I hypothesized that social-emotional support is a mediating variable in the relationship between household structure, the independent variable, and frequency of mental distress, the dependent variable. BRFSS data were analyzed using Statistical Package for the Social Sciences (SPSS) software.

I used the BRFSS questions to operationalize the variables in this study. Operationalization of the independent variable, household structure, was defined as the number and gender of adults living in the household. Operationalization of the dependent

variable, frequency of mental distress, was defined as the number of days in a 30-day period during which the study participant experienced poor mental health. I defined positive mental health as less than 14 days of mental distress. Social-emotional support was the mediating variable and was operationalized based on the participant's response to how often the participant received support needed. The confounding variables were hypothesized to be health care access, race, income, marital status, number of children in the household, and pregnancy status. In Question 3.3 of Section 3, titled "Health Care Access" (CDC, 2011a, p. 11), of the BRFSS, the interviewer asks if health care access has been hindered in the past year due to cost. Questions 12.2, 12.4, 12.6, 12.7, 12.10, and 12.20 in Section 12, titled "Demographics" (CDC, 2011a, pp. 17–19, 23), concern other potential confounding variables, with the interviewer determining race, income, marital status, number of children in the household, and pregnancy status, respectively.

Research Questions and Hypotheses

RQ1: What is the relationship, if any, between household structure and frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status?

$H_0$1. There is no relationship between household structure and frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

H_A1. There is a relationship between household structure and frequency of mental distress, with consideration of the confounding variables health care access, race,

income, marital status, number of children in the household, and pregnancy status.

RQ2: What is the relationship, if any, between household structure and adequate social-emotional support, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status?

$H_0$2. There is no relationship between household structure and adequate social-emotional support, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

H_A2. There is a relationship between household structure and adequate social-emotional support, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

RQ3: What household structure, if any, promotes positive mental health by providing adequate social-emotional support causing a reduction in the frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status?

$H_0$3. There is no household structure that promotes positive mental health by providing adequate social-emotional support causing a reduction in the frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

H_A3. There is a household structure that promotes positive mental health by providing adequate social-emotional support causing a reduction in the frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

Theoretical Framework

The social ecological model (SEM) for health promotion, primarily developed by Stokols and a popular framework in public health research (Sallis, Owen, & Fisher, 2008), provided the theoretical framework for evaluating how mental health in high-risk individuals relates to nonprofessional support in the home environment. Using the Index of Vulnerability, Tallman (2016) verified the connection of social-ecological systems with mental health in relationship to the domains of social support, social status, and access to health care, which were the variables in this study. Social support relates to the independent and mediating variables. Social status and access to health care relate to the confounding variables. For this study, each variable was aligned with its respective levels per the SEM. Frequency of mental distress relates to the individual-level human-environment interaction, while household structure relates to the relationship-level of the SEM. I examined variables at the individual- and relationship-levels.

An analysis revealing a higher frequency in mental distress based on household structure could provide information about mental health risk for nonprofessional support outreach at the community-level. The environment is another key component of the SEM, where household structure is the physical environment that relates to health promotion

(Sallis et al., 2008). The SEM is regularly used to guide health programs by national organizations. For example, the CDC (2002) used the SEM to create a violence prevention model, which increased understanding in how the various social and environmental levels interact in relationship to this problem. More recently, the SEM has been applied to the obesity epidemic in the United States and was used for developing guidelines for healthy eating and promotion of physical activity (United States Department of Health and Human Services [HHS] & United States Department of Agriculture [USDA], 2015). I provide a more detailed description of the SEM constructs and its use for health promotion in Chapter 2.

Nature of the Study

I used secondary data to conduct a quantitative study with a cross-sectional correlational design; cross-sectional designs are used to analyze variables that have already been measured from a specific point in time (Campbell & Stanley, 1963; Frankfort-Nachmias & Nachmais, 2008d). For sampling and data collection, the BRFSS, managed by the CDC (2011d), was used. BRFSS is commonly used in public health research for cross-sectional studies and trend analysis. The study population was collected originally using a complex sampling scheme based on a disproportionate stratified sample (CDC, 2011d). The validation of BRFSS as a telephone survey uses rigorous methods to ensure proper representation of the population by using probability sampling (CDC, 2011d). Survey interviewers randomly dial numbers from a list of telephone numbers within the state that have been vetted to serve as a representative sample of the population (CDC, 2011d).

The sample design for BRFSS uses high- and medium-density stratum to divide the telephone numbers most likely identified to belong to households (CDC, 2011d). The division of numbers into the two strata is determined by where it falls within each grouping of 100 telephone numbers, which typically constitutes an entire state (CDC, 2011d). In 2010, 46 states further divided their samples into smaller strata to obtain more regional specific sampling (CDC, 2011d). Of the 54 states and territories participating in BRFSS, 45 outsourced data collection to universities or firms (CDC, 2011d). The remaining states or territories used the state health department (CDC, 2011d). Interviewers used computer-assisted telephone interviewing software for scripting and data collection (CDC, 2011d), where the variables identified for this study are readily available.

I accessed the data needed to examine the relationship between household structure and frequency of mental distress from the BRFSS. The BRFSS is one of the sources used by the CDC (2013) to track mental health throughout the United States. Household structure is the independent variable, measured by number of adults in the household, with the covariates male and female for gender. Household structure represents the relationship-level of reproductive-age women in the SEM. The dependent variable is frequency of mental distress, with number of days in a 30-day period where poor mental health was experienced. Frequency of mental distress represents the individual-level of reproductive-age women in the SEM. Both the independent and dependent variables are continuous measurements. An additional variable for consideration in the relationship between household structure and frequency of mental

distress is the mediating variable, social-emotional support. Social-emotional support is a categorical measurement using Likert-scale responses in the BRFSS. Understanding the role of social-emotional support as a mediator between household structure and frequency of mental distress provides information relevant to the relationship between these variables. Confounding variables exist and should be adjusted for to reduce bias in data analysis.

I conducted stratification of the population for controlled and confounding variables. The controlled variables are women and age. Based on the literature review, confounding variables that affect household structure and frequency of mental distress for consideration in statistical analysis include health care access, race, income, marital status, number of children in the household, and pregnancy status. The CDC has designated reproductive age as 18–44 years, which, in addition to women, was the initial selection criteria for study participants (Robbins et al., 2014). The BRFSS dataset was used for further demographic specifications serving as confounding variables. The BRFSS data set is readily available online as archival data in a format for transition into the Statistical Package for the Social Sciences (SPSS) software for statistical analysis (CDC, 2011a). Figure 1 below shows the relationship between the independent, dependent, mediating, and confounding variables for statistical analysis.

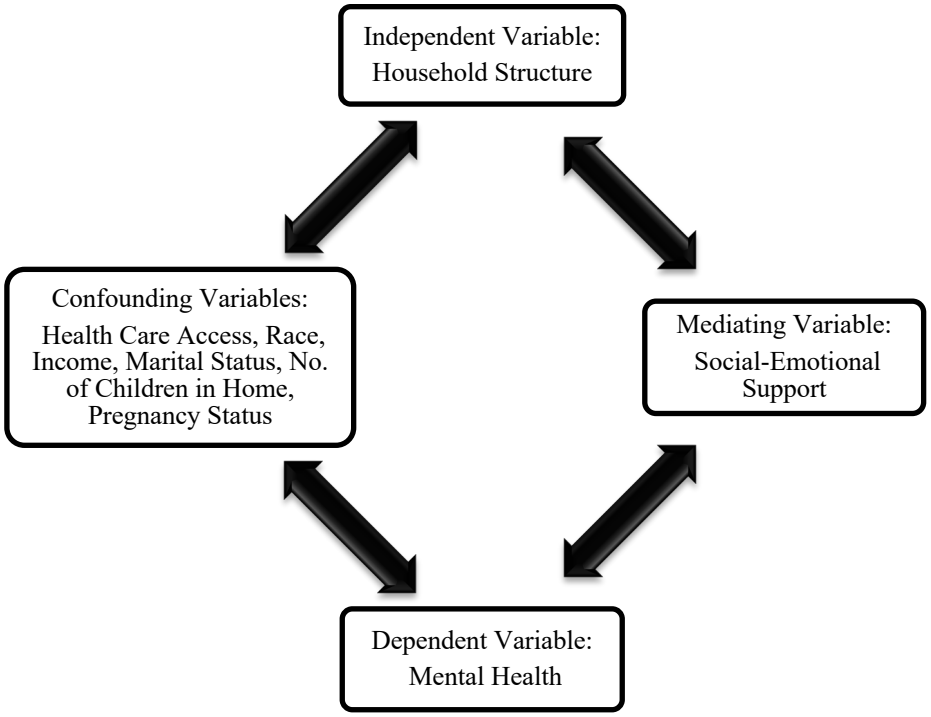

Figure 1. Relationship between variables for statistical analysis.

Pearson's correlation coefficient and linear regression were used to statistically examine the variables and determine if a relationship exist between the independent variable, household structure, and both the dependent variable, frequency of mental distress, and the mediating variable, social-emotional support. Once the first and second research questions are answered, the final research question culminates with a determination if a particular household structure provides adequate social-emotional support for positive mental health. Structural equation modeling is a statistical test that could be used for more definitive understanding of research question three. Definitions of the variables and terms found primarily in the literature are listed in the next section.

Definitions

Frequency of mental distress: Dependent variable; having 14 days or more per 30-day period with poor mental health, to include stress, depression, and problems controlling emotions (Robbins et al., 2014; Xaverius & Salas, 2013).

Health care access: Confounding variable; the ease at which an individual can obtain needed medical services (RAND Corporation, 2019).

Household structure: Independent variable; the number of men and women living in the home.

Low income: Confounding variable; annual household income less than $25,000 (Huot et al., 2013).

Mental health: An individual's emotional, psychological, and social well-being; mental health impacts individual stress management, relationships with others, and the ability to make healthy lifestyle decisions (CDC, 2018).

Mental illness: Conditions that affect a person's thinking, feeling, mood, or behavior, such as depression and anxiety (CDC, 2018).

Nonprofessional support: Social support from individuals outside of the health care environment (Small et al., 2011).

Reproductive age: 18–44 years old (Robbins et al., 2014).

Social-emotional support: Mediating variable; always or usually receiving the social and emotional support needed (Robbins et al., 2014).

Sociodemographic: Demographic information with social implications; for example, age, gender, education, marital status, household, and income (GESIS, 2019).

Assumptions

There are assumptions that exist based on the data collection method and existing literature that supports the need for this study. It was assumed that the participants of the BRFSS answered questions honestly, allowing for the survey to be useful in statistical analysis of the relationship between household structure and frequency of mental distress. Validation of BRFSS questions was an assumption based on the rigorous methods used to develop the questionnaire. When using the BRFSS, randomization of data were assumed based on the complex sampling scheme used to ensure appropriate generalization of the population (CDC, 2011b; 2011c). Ensuring construct validity for this study was an important component for increasing the generalizability of the study.

Construct validity can be improved by using the proper instrument for a study. The BRFSS goes through validity and reliability analysis during question development, using questions that have been field tested prior to their implementation into the survey (CDC, 2011d). The BRFSS undergoes annual review for question validation and has questions found in the National Interview Health Survey and Nutrition Examination Survey (CDC, 2011d). The variables in this study are part of the core components of the BRFSS, which are mandated questions for all participating states (CDC, 2011d). Reproductive-age women wanting a reduction in mental illness was another assumption in this study. Evaluating data associated with household structure and frequency of mental distress for reproductive-age women through Pearson's correlation and linear regression provides methodology assumptions.

The methodology assumptions for these parametric tests include (1) additivity and linearity; (2) normality within the data; (3) homogeneity of variance; and (4) independence (Field, 2013). The bivariate linear regression test assumes that, (1) "the dependent variable is normally distributed in the population for each level of the independent variable", (2) "the population variances of the dependent variable are the same for all levels of the independent variable", and (3) "the cases represent a random sample from the population, and the scores are independent of each other from one individual to the next" (Green & Salkind, 2011b, p. 277). The correlation coefficient test assumes that, (1) "the variables are bivariately normally distributed" and (2) "the cases represent a random sample from the population and the scores on variables for one case are independent of scores on these variables for other cases" (Green & Salkind, 2011a, p. 258). The types of variables and proper analysis based on these assumptions are important factors for consideration during statistical analysis.

Structural equation modeling is a data analysis approach potentially needed if the null hypotheses for research questions one and two were both rejected. Structural equation modeling is a statistical test that uses "a graphical model of means, standard deviations, and correlations... with effect sizes defined as functions of these parameters" (Cheung, 2018, p. 2). The structural equation modeling approach is useful in social science research when the "assumptions of homogeneity of variances, covariances, or correlations can be imposed or relaxed by the use of equality constraints on the parameters" (Cheung, 2018, p. 2). The inclusion of structural equation modeling for statistical analyses is important for variables that require more complex analysis (Cheung,

2018). If using structural equation modeling, the independent variable, household structure, was assumed to be a latent variable having an effect on both observed variables, frequency of mental distress and social-emotional support.

Scope and Delimitations

Selection of the six potential confounding variables was determined through synthesis of the literature review and related public health research. These confounding variables are health care access, race, income, marital status, number of children in the household, and pregnancy status. For example, Adams, Kenney, and Galactionova (2013) and Bloom et al. (2012) conducted research that supports the assumption of the negative impact limited health care access has on women's reproductive health. Race as a confounding variable was specifically chosen based on the cultural and discriminatory considerations along with the statistical contrasts that exists in mental well-being between groups, where White women are more likely to have mental health problems (Schwarz et al., 2012), and Black women are more likely to have challenges during childbirth (Bruce et al., 2012). Income was another confounding variable chosen based on the large amount of supporting research providing evidence in the increase of health disparities for low-income populations (Huot et al., 2013). For example, pregnancy and delivery complications in Georgia are highest among low-income women (Bruce et al., 2012).

Men and women outside of reproductive-age were intentionally excluded from the study population due to the differences in their need for nonprofessional support to reduce the risk of mental illness compared to reproductive-age women, where women are at higher risk for mental illness (Pratt et al., 2011; Wen et al., 2012), and mental illness

increased unintended pregnancy rates (Bayrampour et al., 2015; Hall et al., 2013, 2014, 2015a). Marital status was another factor found in the literature to reduce mental illness (Schwarz et al., 2012; Witt et al., 2012). Children in the household impacted reproductive-age women in different ways indicating a need to include this factor as a confounding variable (Chapman et al., 2012; Molina & Alcantara, 2013; Schwarz et al., 2012). Population selection criteria and confounding variables were chosen as a scope and delimitation of the study in an effort to reduce threats to validity. Confounders identified using the literature were adjusted for during data analysis to reduce bias within the results.

Limitations

A limitation with using secondary data were the reduction in content validity and reliability, where the survey instrument was not designed specifically for this study (Frankfort-Nachmias & Nachmias, 2008c, 2008e). The developers of the BRFSS play a critical role in the construct validity of this study. Cellular and landline telephones are used for data collection through an ongoing monthly call process by interviewers provided with scripted questions (Hu, Pierannunzi, & Balluz, 2011). Follow-up surveys are mailed to participants to help ensure reliability of the data collected. Although construct validity is considered a major limitation when using a secondary dataset, the rigors ensued by the CDC (2011b; 2011c; 2011d) during questionnaire development and use increase the construct validity of the BRFSS making it a valuable tool for this study and a popular data set for use in public health research. Empirical validity was another challenge, where study participants may have recall bias or fail to report accurate

information due to resistance in disclosing personal information (Frankfort-Nachmias & Nachmias, 2008c). The benefits of using a secondary data set was the reduction in time for data collection, access to information that may otherwise be unobtainable, and the large sample size that was used to offset missing data (Frankfort-Nachmias & Nachmias, 2008e). Other researchers used these variables when assessing mental health challenges in reproductive-age women, such as Farr and Bish (2013). The literature review supports the use of BRFSS as a tool for assessment of sociodemographic and mental well-being in reproductive-age women through the numerous studies where BRFSS was used.

Significance

Small et al. (2011) indicated the need for further research in understanding the role of nonprofessional support for women of reproductive-age. The correlation between household structure and frequency of mental distress has not been examined and could provide baseline information for expanding the reach of nonprofessional support strategies in community programs. In this study, specific parameters of reproductive health and nonprofessional support are emphasized, which can be easily gathered by public health professionals. Information gained in this study could provide evidence to support the inclusion of nonprofessional support techniques in research and intervention efforts, which could expand the reach of current intervention programs. Results of this study may provide information on household structures where women are at higher risk for mental illness, allowing for referral to intervention programs that provide social-emotional support on a nonprofessional level. Communities that identify a high

population of reproductive-age women at risk can encourage these strategies to improve outreach support.

With evidence of new and innovative techniques using nonprofessional support to improve mental health in women of reproductive age, information gained in this study could provide sociodemographic risk information relating to social-emotional support at the relationship-level. Programs, such as the MOSAIC and MOMS, would have additional knowledge from this research about the association of mental distress and nonprofessional support in the home environment for women of reproductive age. With additional research, these programs could use more innovative approaches to assist in resources available for community outreach, such as identifying women at higher risk for poor mental health and integrating them with an appropriate mentor. The increased acceptance of nonprofessional support interventions requires an understanding of the reproductive health challenges identified by statistically analyzing the relationships between interrelated variables and looking for emerging patterns of risk. This study poses to provide baseline data about the variables, household structure, frequency of mental distress, and social-emotional support, to help communities determine the need for nonprofessional support supplementation in local public health programs.

Summary

There was a need to determine if household structure relates to mental well-being among reproductive-age women. The provision of baseline data from this study could be used to determine the need for inclusion of innovative strategies, such as nonprofessional support, at the community-level to address the gap in relationship-level support for

individual mental health. Basic understanding of the relationship between the variable's household structure and frequency of mental distress in relation to social-emotional support could provide indication for a need in continued research to assess the validity of nonprofessional support strategies in community public health programs. The potential significance could be evidence for inclusion of nonprofessional support as an innovative approach for local programs that work to improve mental health among reproductive-age women. In Chapter 2, I discuss the literature relating to the SEM and BRFSS; women's reproductive and mental health factors; and health care and nonprofessional support opportunities.

Chapter 2: Literature Review

Introduction

Women with mental illness are at increased risk for health problems and inadequate health care (Ko et al., 2012; Willet et al., 2012), which can negatively impact public health trends associated with population health. Guidance from the CDC identifies mental health as an important element for reproductive-age women, with life satisfaction and social-emotional support being contributing factors for improved health outcomes (Farr & Bish, 2013; Robbins et al., 2014). The role of nonprofessional support in the household structure requires further analysis to determine its relevancy for improving health outcomes in the mental status of reproductive-age women (Small et al., 2011).

The purpose of this quantitative, correlational study was to examine the relationship between household structure and frequency of mental distress, with consideration of the mediation social-emotional support provides. If a relationship does exist, quantitative analysis using the BRFSS could determine which type of household structure provides the best source of social-emotional support and which type may be a risk indicator for nonprofessional support programs focused on reducing mental illness in reproductive-age women. The literature review relies on current research to establish the relevance of this study and its potential to add to the growing body of research in this topic.

Robbins et al. (2014) statistically analyzed the parameters used to evaluate reproductive health using the Pregnancy Risk Assessment Monitoring System (PRAMS) and the BRFSS (Robbins et al., 2014). I examined two of the 10 preconception health

factors Robbins et al. identified for national and state tracking to improve public health outcomes in this study. These two health domains were mental health and social-emotional support. In this chapter, I explain how the SEM can be used to guide the analysis of the relationship of each of these domains to mental health, household structure, and nonprofessional support. The SEM and BRFSS are common tools in public health research (see Bethea et al., 2012; CDC, 2002, 2015b; Farr & Bish, 2013; Huot et al., 2013; Sallis et al., 2008; Stokols, 1992, 1996; Stokols, Grzywacz, McMahan, & Phillips, 2003; Tallman, 2016; HHS & USDA, 2015; Xaverius & Salas, 2012).

The independent variables for this study were number and gender of adults in the household of reproductive-age women, representing the physical environment and relationship-level for theoretical guidance from the SEM. These variables were covariates for the independent variable, household structure; I used the variables to assess how the dependent variable, frequency of mental distress, were affected by different household structures. I analyzed current literature using the BRFSS to support the use of quantitative methodology for my study. In this chapter, I discuss the sociodemographic parameters of the study's population group as they relate to each variable; parameters included reproductive health challenges; income and geographical health disparities; discrimination and cultural factors; health care components; and community support strategies. I conducted the literature search with consideration of each variable and the sociodemographic parameters of the population group of interest. The chapter also includes an overview of my literature search strategy and theoretical framework.

Literature Search Strategy

I completed my search for primary, peer-reviewed sources using the EBSCO Health databases Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE, and ScienceDirect. Key words for the literature search included *preconception health*, *reproductive age*, *low income*, *rural populations*, *mental health*, *mental illness*, *depression*, *anxiety*, *stress*, *life satisfaction*, *quality of life*, *social support*, *social-emotional support*, *household type*, *household structure*, *social ecological model*, and *Behavioral Risk Factor Surveillance System*. These terms were used in combination to provide an inclusive search of the scientific literature from 2012 to present. Table 1 shows the number of peer-reviewed articles found in support of the literature review topics for this study.

Table 1

Number of Sources for Each Literature Review Topic

Area of research	Peer-reviewed articles
Reproductive health	53*
Mental health	8
General health and life satisfaction	5
Social-emotional support	9
Household structure	6
Low income and rural health disparities	21
Discrimination and cultural factors	13
Health care opportunities	18
Inadequacies in health care	7
Social-emotional support	11
Nonprofessional opportunities	15*
Household structure	4
Community and nonprofessional support	12

*Total minus duplications among subtopics.

Theoretical Framework

I used the SEM as the theoretical framework for this study. Reproductive-age women experiencing mental illness face challenges associated with seeking preventative health care, research has shown (see Austin et al., 2013; Bloom et al., 2012; Byatt et al., 2014; Hall et al., 2015b; Huot et al., 2013; Jarrett, 2015; Ko et al., 2012; McCall-Hosenfeld et al., 2012). These challenges can be further understood by examining social support and household structure with regard to frequency of mental distress. Dr. Stokols has been a key contributor to the development of the SEM for public health promotion for almost 30 years (Sallis et al., 2008). Since 1992, he has conducted research using SEM that focuses on four basic assumptions (Sallis et al., 2008). These are

1. Health behavior is influenced by physical environments, social environments, and personal attributes (as cited in Sallis et al., 2008, p. 469).
2. Environments are multidimensional, such as social or physical, actual or perceived, discrete attributes (spatial arrangements) or constructs (social climate; as cited in Sallis et al., 2008, p. 469).
3. Human-environment interactions occur at varying levels of aggregation (individuals, families, cultural groups, whole populations; as cited in Sallis et al., 2008, p. 469).
4. People influence their settings, and the changed settings then influence health behaviors (as cited in Sallis et al., 2008, p. 469).

The SEM provides a framework for understanding the influence of individuals' levels of interaction on their circumstances (CDC, 2015b). According to some

researchers, health promotion research should include an investigation of both the community and environmental resources available to a population group (Stokols, 1992; Stokols et al., 2003). Community resources for health promotion are used for active risk indicators, while environmental resources are passive indicators of a problem and may be less obvious (Stokols et al., 2003). SEM has been used by the CDC (2002) in violence prevention and, collaboratively, by the HHS and USDA (2015) for obesity prevention. Table 2, adapted from the CDC's violence prevention framework, depicts the conceptual framework for the application of SEM in my study. Active and passive components of the SEM were integrated in the study.

Table 2

Application of the Social Ecological Model in Understanding the Relationship Between Household Structure and Frequency of Mental Distress in Reproductive-Age Women

Level of SEM	Potential risk factors	Prevention strategies
Individual	Women 18–44 years Frequency of mental distress	
Relationship	Household structure	Provision of adequate social-emotional support
Community		Supplementing programs with nonprofessional support outreach based on risk indicators

The SEM provides a theoretical framework for evaluating how frequency of mental distress in high-risk individuals relates to nonprofessional support in the home environment by examining variables at the individual- and relationship-level. Active components for my study include individual-level risk factors that could potentially lead to mental illness, as shown in Table 2. These variables include sociodemographic

parameters and frequency of mental distress. The passive components relate to the relationship-level potential risk factors for mental health problems, which could counter the problems by providing adequate support needed for prevention. These variables include the number and gender of adults in a household, labeled as household structure, in relation to the promotion of good mental health through the provision of social-emotional support. As Table 2 suggests, the lack of environmental resources found at the relationship-level could lead to the need for prevention strategies at the community-level. An analysis of a reduction in the frequency of mental distress based on household structure could provide risk indicators at the community-level for nonprofessional support outreach.

Health promotion research can be guided by using the SEM to integrate multiple levels of behavioral and environmental factors, which is a major theoretical strength (Stokols, 1996). Limitations of the theory include the logistical, financial, and time-consuming challenges of incorporating different disciplines for a multi-level inclusive public health prevention program, which becomes impossible for use by practitioners (Stokols, 1996). Researchers should instead focus on the "middle-range" strategy for use of the SEM, where problems and interventions are linked from individual- to community-levels, and can provide more practical applications (Stokols, 1996). The practicality of my research includes the use of a secondary data set from the national level to examine individual- and relationship-level factors, with intervention focus at the community-level.

Methodology

I used the BRFSS to statistically analyze how frequency of mental distress was influenced by household structure through the designation of preidentified health questions used in the survey. The methodology for analyzing the BRFSS was through a cross-sectional correlational design, where the variables are being measured from a specified point in time based on when the BRFSS was conducted (Campbell & Stanley, 1963; Frankfort-Nachmias & Nachmias, 2008d). Although the BRFSS is a secondary dataset, which poses its own challenges to content validity and reliability (Frankfort-Nachmias & Nachmias, 2008c), it has been established for more than 30 years and is widely used in the United States (CDC, 2015a). Researchers commonly use cross-sectional analysis when examining variables in the BRFSS similar to the ones used in this study.

For example, Farr and Bish (2013) conducted a cross-sectional design using data from the 2005, 2007, and 2009 BRFSS to compare mental health status with preconception health indicators. Willet et al. (2012) conducted a cross-sectional design using 2009 BRFSS data to examine social-emotional support, life satisfaction, and mental distress as factors associated with wellness exams in reproductive-age women. Huot et al. (2013) analyzed mental health data from the 2006 BRFSS using a cross-sectional design. Bethea et al. (2012) used the same 2006 BRFSS to conduct cross-sectional design research on the relationship between rural community status and self-rated health. Xaverius and Salas (2013) used a cross-sectional design with the BRFSS data spanning from 2003–2010 to examine trends associated with preconception health. Based on the

multitude of studies using a cross-sectional design with the BRFSS in varying components, this methodology was very feasible for completing this study. Applying the SEM to commonly used questions in the BRFSS for a cross-sectional correlational design provides a standardized measurement tool for continued application by researchers and can specifically be used for public health promotion research in reproductive health.

Literature Review of Related Key Variables and/or Concepts

Reproductive Health Challenges

Reproductive health is highly visible throughout the public and private sector of United States health care and research. The CDC recently identified 10 domains using the PRAMS and BRFSS that should be used to assess and improve reproductive health in communities throughout the nation (Robbins et al., 2014). Robbins et al. found the BRFSS to be a powerful tool for identifying areas for focused intervention efforts in reproductive health. The association between reproductive health and two of the 10 domains, which are mental health and social-emotional support, should be further assessed for a greater understanding of the implications of household dynamics and nonprofessional support on mental health in reproductive-age women.

Mental health impact. Xaverius and Salas (2013) quantitatively assessed the change in health trends over an 8-year period for reproductive-age women responding to the BRFSS and found no improvements in mental distress. Mental health for reproductive-age women should be a top priority due to its impact on many factors relating to the health and well-being of society. As mental distress increases in reproductive-age women, disparities in good general health and social-emotional support

measures also increase (Farr & Bish, 2013). Women who experience higher levels of mental distress are less likely to participate in regular health screenings to assist with the management of their reproductive health (Willet et al., 2012). For women 18–20 years old, stress and depression can be associated with inconsistent use of contraceptives for pregnancy prevention (Hall et al., 2013). The lack of active and appropriate contraceptive use leads to unintended pregnancies, which are further affected by mental health problems.

Young women with depression and stress have higher rates of unintended pregnancies, with more than double the risk occurring among women who are experiencing both mental health problems (Hall et al., 2014). Women with an unintended pregnancy are more likely to be depressed during pregnancy (Bayrampour et al., 2015). For women with poor mental health, Witt et al. (2012) found an increased likelihood of challenges during pregnancy, stillbirth, and low birth weight. A study conducted by El-Mohandes et al. (2011) on pregnancy outcomes related to mental health supports the association between depression and low birth weight. In addition to mental health challenges, reproductive health can be influenced by general health and life satisfaction.

General health and life satisfaction. Poor general health and life satisfaction are elements that can reduce the well-being of reproductive-age women and mental health problems are often a compounding factor. Using the BRFSS for quantitative statistical analysis, Willet et al. (2012) found that reproductive-age women with reduced life satisfaction were less likely to attend routine clinical visits. Wilkinson et al. (2012) used the BRFSS to conduct an assessment of HIV testing for residents in the Southern United

States and found that 40% of women with serious mental distress had never been screened for HIV. This study highlights the potential impact of mental health on general health status by providing evidence that a large percentage of women with mental distress are not seeking preventative care. In contrast, Friedman and Kern (2014) argue that there is no relationship between happiness and positive health outcomes, where mental health problems are a result of already declining health. These researchers argue that care should be taken when developing policies based on correlations from research in limited time-spans and recommend the evaluation of individuals on a case-by-case basis (Friedman & Kern, 2014).

Some women face challenges seeking preventative care; this could be improved with an adequate social-emotional support system from personal to community-based relationships. Kim, Kim, Hong, and Fredriksen-Goldsen (2013) found women with disabilities had reduced quality of life due to an increase in mental distress and inadequate social-emotional support using quantitative statistical analysis of BRFSS data. In addition to disinterest or the inability to seek preventative care services, women may make poor choices that affect their general health status, such as binge drinking. Binge drinking is a serious condition that affects reproductive health. Based on a quantitative statistical analysis of BRFSS data, Wen et al. (2012) found that women binge drinkers were more likely to experience mental health challenges than are men. Many factors can affect an individual's likelihood to make poor decisions about their health. The role of social-emotional support at both the relationship- and community-levels should be emphasized for helping women make positive reproductive health choices.

The influence of social-emotional support. Xaverius and Salas (2013) provided insight on the directional changes in reproductive health over an 8-year period. Using BRFSS, these researchers found a significant increase in social-emotional support for reproductive-age women (Xaverius & Salas, 2013). Willet et al. (2012) analyzed BRFSS and found that social-emotional support can influence the maintenance of healthy lifestyles by increasing the likelihood of routine health care visits. Farr and Bish (2013) used BRFSS to understand how social-emotional support varied between women with and without mental health problems. They found that women with mental illness had a greater risk for reproductive health problems due to a lack of social-emotional support (Farr & Bish, 2013).

There may be risk factors that influence unhealthy reproductive health behaviors. Page et al. (2012) found significant increases in smoking throughout and after pregnancy for women with low income, who were not married, married to a partner who smokes, and who have had minimal attendance to religious services, all of which can be related to a lack of social-emotional support. Women with prior mental health problems were more likely to smoke among all groups, regardless of these risk factors (Page et al., 2012). Pregnant women using drugs may or may not participate in prenatal care visits due to reasons not specific to their drug use, including their social support structure (Roberts & Pies, 2011). Recommendations for improving reproductive health outcomes include the modification of community settings to improve social-emotional support structures and an emphasis on educating women, health care providers, and public health officials (Robbins et al., 2014; Xaverius & Salas, 2013).

There are multitudes of social-emotional support techniques that can be incorporated to improve the health status of reproductive-age women. A local program using telephone counseling to monitor physical fitness goals was partially successful in reducing barriers by providing a support outlet (Albright, Saiki, Steffen, & Woekel, 2015). Health care providers play a vital role in preventative care for reproductive-age women. An analysis of BRFSS data identified the Southern United States as having the highest rates of cervical cancer and lowest number of screenings in the past 5 years (Benard et al., 2014). Insurance coverage can greatly influence a woman's likelihood to seek preventative care. Lack of health insurance coverage and contact with a health care provider were found to be the greatest contributors to inadequate cervical cancer screening (Benard et al., 2014). At the policy-level, requiring insurance companies to include contraceptives in health care coverage has shown an increase in contraceptive use, contributing to an improvement in reproductive health outcomes by reducing unintended pregnancies (Atkins & Bradford, 2014). Personal relationships, such as those found in the household environment, and community intervention programs need to focus on positively supporting reproductive-age women to encourage them to participate in behaviors that contribute to optimal health.

Household structure factors. Regardless of cultural and ethnic variances, household structure is a vital component for understanding factors associated with reproductive health (Speizer, Lance, Verma, & Benson, 2015). Household structure can provide an environment that influences reproductive health positively and negatively. The partner relationship can affect mental health in women, where anxiety increases in

pregnant women with partner tension (Bayrampour et al., 2015). Women living with a partner or married were less likely to have stillborn infants when compared to women who were never married (a 64% increase in risk) and women divorced or separated (an 84% increase in risk; Witt et al., 2012). Children in the household affect the health dynamics of reproductive-age women. Households with children had an increase in inadequate sleep patterns, which could cause health problems in reproductive-age women if they are unaware of techniques to obtain optimum sleep (Chapman et al., 2012). Molina and Alcantara (2013) found that the presence of children in the home improved women's state of mental health, whereas low income caused an increase in mental distress. Health risks are increased by low income and should be thoroughly understood when developing community support programs. In households with food insecurity, reproductive-age women had a greater risk of anemia compared to women in food secure households (Fischer, Shamah-Levy, Mundo-Rosas, Mendez-Gomez-Humaran, & Perez-Excamilla, 2014).

Low income and rural health disparities. It was important to understand the factors associated with an increase in public health disparities for reproductive-age women to determine their relevancy in this study. A quantitative comparison of health care inefficiency and symptoms of depression between rural and non-rural communities using BRFSS showed evidence that low-income or rural location were a contributor to health care challenges (Huot et al., 2013). Additional review of the literature on the association between mental health; general health status and life satisfaction; social-emotional support; and household structure with low-income reproductive-age women

living in rural communities was needed.

Mental health impact. There are multiple factors relating to low income that can increase health disparities in reproductive-age women. Houle (2014) quantitatively examined the impact of household foreclosures on mental health using BRFSS and found the greater the foreclosure rate, the greater the increase in mental health problems for individuals. Mental health decline due to foreclosures faced the highest impact in low-income and minority communities (Houle, 2014). Low income has a compounding effect on the mental and reproductive health of women. Low-income women had a higher prevalence of post-partum depression and smoking compared to women with higher incomes (Bombard et al., 2012). Poor mental health during pregnancy was associated with increased complications in low-income women (Witt et al., 2012), where mental illness was in the top five complications for pregnancy and delivery in Georgia (Bruce et al., 2012). Residence in rural communities may create additional challenges for low-income reproductive-age women.

Women living in rural Appalachian communities with a higher prevalence of low income were significantly more likely to have mental health problems compared to Appalachian communities with higher income levels (Short, Oza-Frank, & Conrey, 2012). Low-income women living in rural Appalachian communities had a higher prevalence of smoking, which was further compounded by symptoms of depression, at a rate of 49.3% (Wewers et al., 2012). Bloom et al. (2012) identified stressors in 24 low-income pregnant women living in a rural community and found commonalities of finance-related stress, dependence on extended family, and loneliness. Depressive

symptoms and post-traumatic stress were found to be elevated in this population where the study participants desired employment, accessibility to job skills training, and intervention programs to reduce their stressors (Bloom et al., 2012). Prenatal visits can be used to address challenges to mental health in rural communities, providing an opportunity for health care providers to address maternal stress and mental health (Bloom et al., 2012). The relationship between low income and residence in rural communities on reproductive health may also relate to reported general health status and life satisfaction.

General health and life satisfaction. Bethea et al. (2012) initially found poorer self-rated health in rural communities compared to urban communities. Statistical analysis of the BRFSS data showed a higher number of people living in rural communities were low-income, obese, and had lower education levels than urban communities (Bethea et al., 2012). Adding these factors as covariates clarified that low income was a risk factor for poorer self-rated health for all study participants, regardless of residential status (Bethea et al., 2012). Shen and Sambamoorthi (2012) conducted a quantitative analysis with women on the relationship between financial challenges and quality of life measures, to include general and mental health, and found an increase in health problems for each measure when finances were a problem. If low income plays a greater role in public health disparities than location in rural communities, then a review of state and policy-level factors was warranted for greater clarification. Health care reform showed success in improving general and mental health, where low-income residents of Massachusetts increased their use of health care services for general well-being (Van der Wees, Zaslavsky, & Ayanian, 2013).

The expansion of Medicaid has been linked to a significant improvement in self-reported health responses in BRFSS (Sommers, Baicker, & Epstein, 2012). The greater availability of Medicaid has caused a significant reduction in deaths among nonwhites and individuals living in low-income communities (Sommers et al., 2012). The addition of resources in family planning clinics for supporting low-income women could assist in shortening the gap in health disparities for this vulnerable group (Bombard et al., 2012). Communities have many reasons for improving and developing more innovative social-emotional support programs to reach low-income reproductive-age women.

The influence of social-emotional support. Many levels of the support network must provide social-emotional support to be productive in positively influencing health behaviors of reproductive-age women. There may be factors limiting reproductive-age women from participating in reproductive health visits. For rural pregnant women seeking treatment for substance abuse, the primary reasons identified for not seeking care were availability, accessibility, affordability, and acceptability (Jackson & Shannon, 2012). Accessibility of reproductive health care services may not be related to the lack of use in these services, requiring more innovative programs to encourage rural women to show concern for their reproductive health (Chuang et al., 2012). Health care providers polled in rural communities felt they had a greater obligation to focus on reproductive health than their non-rural counterparts (Chuang et al., 2012). Although they felt this obligation, minimal time, resources, and disinterest from patients for discussion of family planning were common barriers (Chuang et al., 2012). Other challenges may exist when medical services are readily available.

Harelick et al. (2011) found that although low-income reproductive-age women have had health care providers discuss health risk factors, a majority of these risk factors were disregarded by patients. Bronstein et al. (2012) found trust as an important component for low-income reproductive-age women to discuss health concerns with reproductive health providers. McAlearney et al. (2012) found that health care providers in rural communities who emphasized communication and encouragement with their female patients were able to build trust in them to follow medical advice, increasing participation in medical screening services for reproductive-age women. Women who did not trust their health care provider were less likely to follow the medical advice provided (McAlearney et al., 2012). Bronstein et al. (2012) found that reproductive health providers initially identify only eight percent of problems, demonstrating how important it was for patients to share their concerns. Challenges for treatment of health problems identified by reproductive health providers included a lack of knowledge about community programs for uninsured patients (Bronstein et al., 2012). Community health intervention programs for low-income reproductive-age women should focus on additional methods outside of a medical office for encouraging positive health behaviors (Harelick et al., 2011). The integration of relationship and community programs for social-emotional support could provide greater outreach for low-income reproductive-age women.

Schoenberg, Howell, Swanson, Grosh, and Bardach (2013) identified social-emotional support in rural communities as an important element for individual health knowledge, where family and religious support personnel are two components that may

provide contradictory information for positive health-related behaviors. Rural communities should adopt intervention programs to expand their social-emotional support networks, which could include educational tools for developing nonprofessional support groups (Schoenberg et al., 2013). For overweight and obese low-income pregnant women, family and friends had the most influence on their health decisions (Anderson et al., 2015). Owing to a lack of time, training, and additional priorities, OB/GYNs did not discuss weight gain during pregnancy (Anderson et al., 2015). Pregnant women and OB/GYNs identified peer-facilitated support groups using professional expertise for reproductive health support as an innovative intervention method (Anderson et al., 2015). The integration of professional and nonprofessional support programs could provide an improved reproductive health social-emotional support structure for low-income and rural reproductive-age women.

Household structure factors. Nonprofessional support initially begins in the home environment. Bloch et al. (2010) conducted a study on the influence of partnership status for unmarried low-income women during pregnancy. Women lacking a strong relationship with their partner had an increased likelihood of depression, stress, drug abuse, and smoking (Bloch et al., 2010). Income status can increase unhealthy reproductive health behaviors. Quantitative analysis using the BRFSS identified low-income households as having a significantly lower likelihood for participating in healthy dietary behaviors, increasing health disparities for low-income reproductive-age women (Grimm, Foltz, Blanck, & Scanlon, 2012). This information suggests it is critical to integrate nonprofessional and professional support structures, allowing for greater

implementation of community programs that encourage positive reproductive health. Inclusion of the dynamics of discrimination and cultural factors should be further understood relating to the influence of household structure on frequency of mental distress for reproductive-age women.

Discrimination and cultural factors. Public health disparities exist between reproductive-age women of different ethnicities, where Black women typically face the greatest disparities. Examination of the literature explores how racial and gender discrimination relate to public health disparities, along with cultural factors that could influence this study. For example, health disparities due to racial discrimination were identified as key factors associated with higher rates of foreclosures for the Black population (Keene, Lynch, & Baker, 2014). The influence of discrimination and cultural differences should be understood when analyzing the association between mental health; general health status and life satisfaction; social-emotional support; and household structure of reproductive-age women.

Mental health impact. In assessing mental health among reproductive-age women, Robbins et al. (2014) found a frequency of mental distress in 15.1% of Black women, 13.4% of Hispanic women, 12.9% of other races, and 12.8% of White women. Regardless of race or ethnic background, discrimination can affect the mental health of reproductive-age women. For women, this could impact reproductive health by increasing their likelihood to participate in unhealthy behaviors, such as smoking. Purnell et al. (2012) found that individuals were more likely to smoke due to an increase in mental distress caused by perceived discrimination in health care settings. Byrd (2012)

found that racial discrimination caused a higher level of mental distress in White individuals compared to other ethnicities, possibly due to a difference in cultural perceptions. Young women with higher levels of mental distress and felt socially discriminated had higher rates of unintended pregnancy (Hall et al., 2015a). Black women still face the greatest health disparities associated with mental illness. In Georgia, pregnancy and delivery complications are highest among Black women, with mental illness reported among the top five most common complications (Bruce et al., 2012).

Nationwide, Black women had a 35% increase in pregnancy complications compared to White women, whereas these complications quadrupled the likelihood of having a low birth weight infant (Witt et al., 2012). Among low-income Black women seeking care throughout pregnancy, discrimination levels were higher for younger pregnant women starting in their second trimester and then decreased postpartum (Rosenthal et al., 2014). As discrimination levels increased, depression and anxiety also increased (Rosenthal et al., 2014). Rosenthal et al. identified food insecurity as having the greatest influence on anxiety for low-income Black women experiencing discrimination. The impact of discrimination can affect the general health status and life satisfaction rating of reproductive-age women.

General health and life satisfaction. Hispanic women reported the lowest ratings for having a good or better general health status at 80.9% compared to Black women at 85.5%, women of other ethnicities at 88.9%, and White women at 91.8% (Robbins et al., 2014). Asada, Whipp, Kindig, Billard, and Rudolph (2014) used the BRFSS to quantitatively examine discriminatory aspects of general health status and mental health

based on gender and race for counties throughout the United States. Asada et al. determined that local health officials must evaluate specific risk factors to identify where inequalities are highest in order to effectively reach county populations (Asada et al., 2014). The focus of my dissertation on the relationship between household structure and frequency of mental distress in reproductive-age women emphasizes a specified population in need of effective public health programs and works to identify an area, the household environment, where inequalities in social-emotional support may exist.

The influence of social-emotional support. When quantitatively comparing social-emotional support in women of different racial groups using the BRFSS, White women had the greatest support at 85% and Black women had the lowest support at 69.7% (Robbins et al., 2014). Keene et al. (2014) examined the effect of health problems on the ability to overcome mortgage strain for Black homeowners and found access to personal and community resources for a supportive health network were lacking due to racial discrimination. The breakdown in availability of health resources led to a high rate of individuals affected by health problems at a young age, increasing their vulnerability during financial crises, resulting in higher foreclosure rates (Keene et al., 2014). A strong social-emotional support structure can improve reproductive health outcomes for women, which can be influenced by culture.

Brown, Webb-Bradley, Cobb, Spaw, and Aldridge (2014) worked to explore how culture influences safe sex practices in Black women. Black women who had stronger relationships with their fathers were less likely to ask sexual partners about their sexual history, which could negatively influence their reproductive health (Brown et al., 2014).

In contrast, Black women with strong body images were more likely to participate in safe sex practices by asking sexual partners about their sexual history (Brown et al., 2014). Nikolajski et al. (2015) conducted a qualitative study on the role of pressure from male partners in increasing unintended pregnancy rates for Black and White women. Black women faced more than twice the rate of reproductive coercion than White women, 53% to 20% respectively, and had a higher rate of unintended pregnancies related to these encounters (Nikolajski et al., 2015). Factors that increased pressure from male partners in Black women included a potential end to the relationship or pending incarceration (Nikolajski et al., 2015). The role of the partnership in the household environment can play a key role in reproductive health practices for reproductive-age women.

Household structure factors. Although significant differences existed in racial comparisons for low birth weight infants, with Black women experiencing the greater risk, the inclusion of marital status reduced the effect of race rendering it insignificant (Witt et al., 2012). Women who were never married were more likely to have low birth weight infants regardless of race (Witt et al., 2012). Schwarz et al. (2012) assessed the relationship between different racial groups, depression, and partner status with and without children in reproductive-age women, where White women were significantly affected by depression when they were single. Single White women with children in the household had a significantly higher level of depression than those without children (Schwarz et al., 2012). Black women showed no significance in relation to partner status and depression with or without children in the household (Schwarz et al., 2012). When the male partner is an active member of the household structure, other factors can cause

mental strain in the home environment. Dereuddre, Missinne, Buffel, and Bracke (2014) conducted an examination of gender specific household factors relating to depression.

Households where men worked full-time and women worked part-time caused an increase in depression level for men (Dereuddre et al., 2014). Households where both partners were full-time did not affect the mental health of men if they were the primary income earners (Dereuddre et al., 2014). Women who worked full-time and made more money than their male counterparts increased depression levels in their partners (Dereuddre et al., 2014). This study provides evidence of the relationship between gender inequality and mental health for the household environment, where social support at the relationship-level can be compromised due to discrimination toward working reproductive-age women. Income level, geographic location, discrimination, and culture are sociodemographic factors that can impact mental wellness, general well-being, and social-emotional support at the individual-level. Current literature relating to health care, community public health programs, and nonprofessional support should be more fully understood in order to support the need for additional research in nonprofessional support strategies.

Health Care Opportunities

Health care workers play a critical role in encouraging positive health behaviors for reproductive-age women, which can impact the overall health and quality of life for future populations. There are many studies that provide evidence regarding the inadequacies of health care services and influence of health care on social-emotional support for reproductive-age women. Hall et al. (2015b) pointed out the importance of

health care workers in promoting the right contraceptives for women with mental health problems to help them avoid unintended pregnancies. Although health care workers may have the best intentions, the mental health needs of reproductive-age women may go unmet without proper training and the support of nonprofessional support programs. There must be an understanding of the current inadequacies and influence that health care has for reproductive-age women in order to support the need for innovative approaches that can be provided through community intervention efforts.

Inadequacies in health care. Despite emphasis in 2005 from the CDC, American Academy of Family Physicians, and American College of Obstetricians and Gynecologists, the integration of preconception counseling for reproductive-age women during primary care visits only increased from 9.5% in 1998 to 14% in 2010, primarily due to the discussion of contraceptives (Bello et al., 2015). Morgan et al. (2012) conducted a qualitative study to determine the involvement of over 400 OB/GYNs in routine care for women. Inadequacies in routine care included counseling on sexual abuse, domestic violence, and folic acid intake (Morgan et al., 2012). The OB/GYNs spent more of their time working with labor and delivery patients, where 71% of these doctors had at least 50% of their patients initially contact them once pregnant (Morgan et al., 2012). The lack of emphasis on routine care from OB/GYNs could lead to an increase in unaddressed mental health challenges at the clinical level. Additional inadequacies in routine care for reproductive-age women have been observed.

McCall-Hosenfeld et al. (2012) identified preventative care for reproductive-age women in urban and rural communities to be at a low level. Individual factors, such as

mental stability with reduced stress and depression; adequate social support; and interaction with an OB/GYN, improved the likelihood of receiving preventative care and provides evidence to support research and programs working to improve mental health and social support in reproductive-age women (McCall-Hosenfeld et al., 2012). Hall, Moreau, and Trussell (2012b) found an eight percent reduction in use of reproductive health services between 2002 and 2008, primarily for contraceptives. A reassessment of data conducted by Hall et al. (2012a) showed a seven percent increase in use of reproductive health services from 2006 to 2010 due to an increase in sexually transmitted disease services, demonstrating stability and a lack of overall improvement for reproductive health service use. Although pregnant women have a greater amount of contact with health care workers, their mental health needs are often unaddressed.

Ko et al. (2012) identified a lack of health care support for reproductive-age women with major depressive disorder, regardless of pregnancy status. Researchers compared the diagnosis and treatment status for major depressive disorder in 9,000 pregnant and non-pregnant women and found that pregnancy status did not increase the likelihood of diagnosis for major depressive disorder (Ko et al., 2012). For women who were diagnosed, approximately 50% of both pregnant and non-pregnant women received treatment (Ko et al., 2012). Prescription drugs are the primary method used to treat women with mental illness; barriers to this treatment included financial strain, unwillingness to participate in recommended methods, and impact on personal reputation (Ko et al., 2012). Even pregnant women who received 24-hour care experienced

insufficient attention to their mental health needs by health care providers (Byatt et al., 2014).

Depression and anxiety were assessed in women hospitalized early due to a high-risk pregnancy, where rates of mental illness, changes during hospitalization, and rates of treatment were analyzed (Byatt et al., 2014). Byatt et al. found both depression and anxiety prevalent among hospitalized pregnant women though only 5% received treatment for their mental illness. One reason for the lack of health care support in diagnosis and treatment of pregnant women with mental health problems could relate to health care providers with lack of training or feelings of discomfort in dealing with reproductive-age women's mental health needs. Jarrett (2015) provided a questionnaire to midwifery students and found a large percentage with inadequate knowledge of the health risks posed by women with mental health problems during and after pregnancy. Midwifery students felt unprepared and uncomfortable dealing with mental health problems in patients, providing evidence for the need for increased emphasis in education and training (Jarrett, 2015). Although many inadequacies exist in health care services for reproductive-age women, it was important to note the community-level influence health care has on social-emotional support.

The influence of social-emotional support. Health care providers and workers can promote positive outcomes for reproductive-age women, making them an important part of the support network. There are multiple strategies that have been tested to determine their success in improving the health of reproductive-age women. Quantitative analysis of the BRFSS indicated an increase in lifestyle changes for women who received provider

specific counseling (Bombard, Robbins, Dietz, & Valderrama, 2013). The integration of counseling during prenatal care by a smoking cessation specialist demonstrated success in reaching reproductive-age women with greater health disparities (Fendall, Griffith, Iliff, Lee, & Radford, 2012). Fendall et al. (2012) identified an innovative way to address health concerns among a high-risk group that did not otherwise seek preventative health care. In a year and one quarter, the rate of smoking at delivery decreased from 27.3% to 19.3% (Fendall et al., 2012). The Setting Universal Cessation Counseling Education and Screening Standards (SUCCESS) program was another innovative program using evidence-based practices to train health care providers and nurses on smoking intervention methods (Albrecht, Kelly-Thomas, Osborne, & Ogbagaber, 2011). In addition to reaching groups with greater health disparities, health care workers must be able to diagnose and treat mental illness.

Price et al. (2012) tested an intervention method for improving diagnosis and treatment of depression in pregnant women. These researchers identified factors associated with common practices for health care providers with experience in diagnosing and treating depression in pregnancy (Price et al., 2012). Findings support the use of motivational interviewing techniques to increase confidence in health care providers and emphasize the importance for assisting pregnant patients with mental illness (Price et al., 2012). One tool that can be used is the Antenatal Risk Questionnaire. The Antenatal Risk Questionnaire has been assessed for use by pregnant women and midwives in conjunction with other screening tools and was found highly effective for identifying women at risk for mental health problems postpartum (Austin et al., 2013).

Huot et al. (2013) suggested the use of pharmacists as an intermediate health care provider for assisting low-income and rural community patients with depression. Policy-level health care support has been an important factor in improving preconception health care in high-risk groups.

When considering health disparities for low-income reproductive-age women, Wherry (2013) conducted a quantitative analysis on the impact of an increase in family planning support through Medicaid over a 16-year period. Wherry found an increase in papanicolaou tests and breast exams for reproductive-age women with no significant changes in wellness visits and Human Immunodeficiency Virus (HIV) screening. Adams et al. (2013) examined the role of Medicaid family planning services for low-income reproductive-age women and found an eight percent increase in wellness visits and 12% increase in contraceptive counseling, with a three percent decline in pregnancy rates. Adams et al. confirmed the supportive role of Medicaid family planning for increasing wellness visits in low-income reproductive-age women. One program found successful in promoting positive outcomes for women during the postpartum period related to Medicaid family planning expansion is Centering Pregnancy (Hale et al., 2014).

In 1998, Certified Nurse Midwife Sharon Schindler Rising developed the program Centering Pregnancy (Bell, 2012). There are studies that support its success in promoting healthier pregnancies and postpartum outcomes for women (Bell, 2012; Hale, et al., 2014). Centering Pregnancy uses innovative techniques in the health care setting to promote open communication in private and group settings between expectant mothers (Bell, 2012; Hale et al., 2014). Women in the Centering Pregnancy program have an

increased sense of self-efficacy relating to their abilities to have a healthy pregnancy and successful delivery (Bell, 2012). Centering Pregnancy has been successful in working with minority groups and encourages the participation of partners, including those in non-traditional households (Bell, 2012). The household environment can determine the likelihood of continued participation in social-emotional support strategies established by health care providers.

Nonprofessional Opportunities

The use of nonprofessional support strategies for community initiatives to improve participation rates deserves further investigation as an assistive component for community support programs for reproductive-age women. Household structure and mental health are easily identifiable sociodemographic factors that can be assessed during initial contact with patients at local public health clinics to determine their need for nonprofessional support. The impact of nonprofessional support should be further understood to determine how it could enhance community support programs. Existing literature supports the relationship between community and nonprofessional support methods in terms of mental health; general health status and life satisfaction; and social-emotional support.

Household structure factors. In a study conducted by Haley et al. (2014), the Behavioral Model for Vulnerable Populations was used to guide trials to prevent HIV in reproductive-age women. Women were less likely to attend the prevention training if they lacked a stable household structure (Haley et al., 2014). Health officials should be knowledgeable about their target population, including the impact of household structure,

in order to increase success rates in intervention efforts (Haley et al., 2014). Partner inclusion in health decision-making continues to be an under recognized component for improving reproductive health. Laidsaar-Powell et al. (2013) conducted a systematic review of studies relating to partners in the clinical setting and found the partner support role contributed to an increase in social-emotional support for the patient.

Married women are more likely to participate in local community programs than women who are not married (Brownell et al., 2011), making it challenging to reach high-risk groups. Women experiencing unstable housing situations experience a higher risk of mental health problems (Allen et al., 2014). The Boston Public Health Commission and Boston Housing Authority developed a partnership to assist low-income pregnant women facing housing insecurity issues (Allen et al., 2014). Of the women in need of housing, 56% had poor mental health with an increased amount of depression, and 41% had symptoms related to post-traumatic stress disorder (Allen et al., 2014). Identifying the nonprofessional support structure in community family planning programs could be an innovative strategy for reaching high-risk patients to improve reproductive health outcomes.

Community and nonprofessional support strategies. The use of community programs provides a vital element for addressing local public health issues and should supplement existing programs in the health care model. The method of community involvement can vary from local public health services for low-income populations to community outreach programs. Although many community programs exist for pregnant women with low income, participation rates for these programs are often low. An

examination of participation in the Manitoba Healthy Baby Program, which provides income support and encourages participation in local community support programs, showed that 77.8% of women in an assistive income program did not participate in local support programs (Brownell et al., 2011). Community and nonprofessional support programs can promote positive mental health in reproductive-age women.

Mental health impact. A community intervention found successful in reducing stress for young women used the approach of gathering women together to discuss challenges they face, providing educational material for women, and practicing relaxation techniques (Stromback et al., 2013). The sessions allowed for personal development, empowerment, and an outlet for discussing problems in a trusted setting (Stromback et al., 2013). The major component for the intervention was the removal of individualization of women's issues and transformation into a community support outlet for overall improvement (Stromback et al., 2013). In the Manitoba Healthy Baby Program, participation rates increased in pregnant and new mothers experiencing mental health problems (Brownell et al., 2011). The emphasis of empowerment, trust, and an increase in self-efficacy to improve mental illness can be embodied through nonprofessional support programs.

The use of nonprofessional support for low-income Black young adults in an employment-training program showed no improvement in mental health or the ability to manage mental health challenges (Tandon, Maulik, Tucker, & Sonenstein, 2012). The strategy used referrals to a mental health clinician, peer-led sessions for trainees with depression, and specific training in mental health for training staff (Tandon et al., 2012).

Participants that used mental health services prior to the intervention were more likely to use them after the intervention, similar to findings of the Manitoba Healthy Baby Program (Tandon et al., 2012). Although the program incorporated a combination of health care, community, and nonprofessional support strategies, the lack of a gender- and culture-specific focus may have been related to no observed improvement in the study participants.

The MOSAIC is a nonprofessional support program developed to reduce depression and partner violence in mothers (Taft et al., 2011). The program trains local mothers to conduct home visitations with program participants, focusing on friendship, parental help, and advocating for external assistance (Taft et al., 2011). Participants accepted MOSAIC at a rate of 82%, providing feedback that they would recommend the intervention to friends experiencing similar challenges (Taft et al., 2011). The intervention showed the greatest potential for reducing partner violence, while improving mental health (Taft et al., 2011). Another program in early implementation is the New Haven MOMS Partnership (Smith & Kruse-Austin, 2014).

Health officials and the academic community used CBPR to develop a nonprofessional support program, MOMS, to improve mental health in pregnant women and mothers using CMHAs (Smith & Kruse-Austin, 2014). The CMHAs are selected based on their connectedness with the targeted population in order to have a cultural understanding of the population, allowing them access for providing and referring mental health services (Smith & Kruse-Austin, 2014). The CMHAs have no relationship to the clinical setting and were selected based on their outreach services in the local

environment (Smith & Kruse-Austin, 2014). Using a 5-year strategic plan, the MOMS Partnership hopes to improve mental health in pregnant women and mothers, with advocacy, education, care, system navigation, and outreach as their primary goals (Smith & Kruse-Austin, 2014). Peer-led interventions for nonprofessional support have shown success in improving general health and life satisfaction.

Owing to the increase in depression and poor quality of life for individuals with chronic diseases, the community of Pasos Adelante developed a 12-week program that used educational forums and walking groups to improve health among program participants (Cutshaw, Staten, Reinschmidt, Davidson, & Roe, 2011). Participants had a significant reduction in mental distress from start to the end of the program and 3-months after, decreasing from 20.8% to 10.6%, and 11.3%, respectively (Cutshaw et al., 2011). Participant rating for quality of life as 'poor' or 'fair' decreased by 9.3% at the end of the program (Cutshaw et al., 2011). *Promotoras*, or nonprofessional support leaders, led the program by conducting educational forums and establishing walking groups (Cutshaw et al., 2011). The *promotoras* reduced their participation in the walking groups until the groups themselves became self-led by the participants, promoting a nonprofessional support atmosphere (Cutshaw et al., 2011). This program allows for community members to build a social-emotional support network through nonprofessional strategies.

The influence of social-emotional support. Community interventions should be developed based on cultural norms, where the implementation of reproductive health strategies has shown an increase in popularity. A quantitative examination of the 2008 BRFSS in New York provided verification of community acceptance for increasing

preconception health discussions in the public setting (Thomas, Homawoo, McClamroch, Wise, & Coles, 2013). Sacred Beginnings is a community-based participatory research program designed to improve reproductive health in Northern Plains American Indian adolescent females using input from tribal members and elders (Richards & Mousseau, 2012). Significant improvement occurred in preconception health knowledge for adolescents in the intervention compared to the non-intervention group (Richards & Mousseau, 2012), emphasizing the importance of incorporating cultural norms into program development. Community public health officials should use a proactive and opportunistic approach when working to promote reproductive health.

Women participating in the BABY & ME-Tobacco Free program showed significant improvements in smoking cessation by receiving information through prenatal sessions (Gadomski, Adams, Tallman, Krupa, & Jenkins, 2011). A nonprofessional support strategy evaluated by Bignell et al. (2012) used volunteer lactation counselors for community support among new mothers. When compared to paid lactation counselors, volunteers used varying interactive methods for instructing new mothers on breastfeeding techniques and were less likely to refer mothers to community services (Bignell et al., 2012). Nonprofessional support personnel should be properly trained and understand the expectations set forth by the community program (Bignell et al., 2012). Effective training programs for nonprofessional support volunteers can benefit reproductive health programs.

A Black minority college in North Carolina successfully implemented the Preconception Peer Educators program (Mead & Chapman, 2013). College students

participating in this program used multiple outreach events to educate students ranging from 12–24 years old (Mead & Chapman, 2013). The college student volunteers conducted educational forums, distributed information packets, and collected data from the audience about preconception health knowledge and the program's effectiveness (Mead & Chapman, 2013). Although many nonprofessional support strategies have shown promise in improving reproductive health, a gap in the literature still remains when considering the implementation of nonprofessional support strategies in community programs to improve mental health of reproductive-age women.

The incorporation of nonprofessional support strategies can be an innovative way for communities to address the specific needs of reproductive-age women with mental health challenges. Small et al. (2011) used a qualitative approach with reproductive-age women experiencing intimate partner violence to help clarify the meaning and need for nonprofessional support. Small et al. found that most social support strategies have been conducted with higher risk populations through the use of health care professionals, primarily focusing on concerns related to the well-being of children in the home. Interventions that included nonprofessional support strategies usually did not provide the services that reproductive-age women felt were most important, which were a sense of friendship and having someone to listen (Small et al., 2011).

After two trials using nonprofessional support, the study participants found an increase in self-efficacy and connectedness with others through a non-judgmental and understanding relationship; this was found as the most beneficial components of the trials (Small et al., 2011). Small et al. identified common challenges with the inclusion of

nonprofessional support strategies, most importantly training should be provided to nonprofessional support personnel without creating a 'professionalistic' approach, outcomes for the nonprofessional support should be clearly defined to determine length of the support strategy, and there should be methods in place to determine a woman's need for nonprofessional support. The goal of the proposed research was to explore further the relationship between frequency of mental distress and the household environment in reproductive-age women.

Summary

In Chapter 2, I provided an in-depth review of the current literature relating to frequency of mental distress, social-emotional support, and household structure for reproductive-age women. There were three critical areas of review for these variables, which were reproductive health, health care opportunities, and nonprofessional opportunities. The effect of low-income status, geographic location, discrimination, and cultural norms were also discussed. The SEM provided the theoretical basis for my study by defining the elements of mental health support for reproductive-age women at the relationship-level through the physical environment of the household. The SEM provided a basis for examining the inadequacies of health care services for reproductive-age women and supporting the need of supplementing community-level public health practices through innovative programs based on relationship-level risk.

The literature review revealed that a limited amount of research has been conducted in relation to the independent variable, household structure. The literature that does exist provides very little information on the relationship between household

structure and frequency of mental distress, with no examination of social-emotional support as a mediating variable. The literature does provide supporting evidence for the importance of looking toward additional means outside of health care professionals to improve mental health in reproductive-age women. Nonprofessional support has been qualitatively analyzed as a potential source for improving mental health in reproductive-age women and programs have been piloted in some communities. Quantitative analysis that examines household structure as a type of nonprofessional support does not exist.

Quantitative analysis of the BRFSS data provided evidence of mental health as an area in need of greater attention by public health researchers and practitioners, where an increase in mental health disparities affected general health and effective development of social-emotional support structures. Poor mental health and the lack of social-emotional support structures in reproductive-age women increases the likelihood of unintended pregnancies and can negatively impact birth outcomes. Implementation and improvement in support outreach has been shown at the policy, health care, and community levels to promote reproductive health, but social-emotional support for women with mental health needs is still lacking. An increased understanding of how to identify reproductive-age women in need of nonprofessional support for mental health problems needs to be further evaluated. Through quantitative statistical analysis, I examined the effect of household structure on frequency of mental distress for reproductive-age women.

In Chapter 3, I provide details on the methodology I used for my study. The SEM was used to guide development of the research questions; null and alternate hypotheses; and predictions. The BRFSS was the secondary dataset I used to provide the data for

statistical analysis to determine if the number and gender of adults in a household affects frequency of mental distress of reproductive-age women.

Chapter 3: Research Method

Introduction

The purpose of this quantitative, correlational study was to examine the relationship between household structure and frequency of mental distress, with consideration of the mediation social-emotional support provides. If a significant relationship existed, quantitative analysis using the BRFSS could determine which type of household structure provides the best source of social-emotional support and which type may be a risk indicator for nonprofessional support programs focused on reducing mental illness in reproductive-age women. This information could be used to promote the supplementation of nonprofessional support in public health programs in communities with reproductive-age women at risk for mental illness. This chapter includes the rationale for the research design and details about the methodology. The description of the methodology includes information about the population of interest, sampling procedures, and the BRFSS. Information pertaining to statistical analysis of the BRFSS was an important component for understanding how the results in Chapter 4 were obtained. This chapter ends with an assessment of threats to validity and ethical considerations for this study.

Research Design and Rationale

The research questions were

RQ1: What is the relationship, if any, between household structure and frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status?

$H_0$1. There is no relationship between household structure and frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

H_A1. There is a relationship between household structure and frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

RQ2: What is the relationship, if any, between household structure and adequate social-emotional support, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status?

$H_0$2. There is no relationship between household structure and adequate social-emotional support, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

H_A2. There is a relationship between household structure and adequate social-emotional support, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

RQ3: What household structure, if any, promotes positive mental health by providing adequate social-emotional support causing a reduction in the frequency of mental distress, with consideration of the confounding variables health care access, race,

income, marital status, number of children in the household, and pregnancy status?

$H_0$3. There is no household structure that promotes positive mental health by providing adequate social-emotional support causing a reduction in the frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

H_A3. There is a household structure that promotes positive mental health by providing adequate social-emotional support causing a reduction in the frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

To examine the relationship between variables, I used a cross-sectional, correlational design. The relationship between household structure and frequency of mental distress was determined using Pearson's correlation coefficient to first examine if the variables had an association with one another. If an association existed, linear regression was used to identify how the independent variable affected the dependent variable. Structural equation modeling was an additional analysis that was necessary only if an association was found between the mediator variable and both the independent and dependent variables. Household structure was the independent variable based on a combination of the covariates, number and gender of adults, and was a continuous measurement. The dependent variable was frequency of mental distress. Frequency of

mental distress was a continuous measurement based on the number of days the participants had poor mental health for a 30-day period.

In examining the relationship between household structure and frequency of mental distress, I considered it important to consider if social-emotional support was a mediator variable in the causal pathway. A mediator variable is one that affects the relationship between the independent and dependent variable by occurring in the sequence between the predictor and outcome (MacKinnon & Luecken, 2011). The composition of household structure, the predictor, may have affected frequency of mental distress, the outcome, by providing social-emotional support, the mediator. In BRFSS, adequate social-emotional support is a categorical measurement using a 5-point Likert scale. The Likert-scale has a continuous underlying concept of time and approximately equal intervals between points, supporting its use in parametric analysis (Murray, 2013; Sullivan & Artino, 2013). The selected population for this study was reproductive-age women, specified as 18–44 years old (Robbins et al., 2014). Confounding variables may influence both the predictor and outcome variables (MacKinnon & Luecken, 2011). Based on the literature review, potential confounding variables included access to health care, race, income, marital status, number of children in the household, and pregnancy. The influence of confounders can be mitigated through proper stratification (Pourhoseingholi, Baghestani, & Vahedi, 2012). Each of these variables plays an important role in validating the rationale for a cross-sectional correlational design.

I used findings from the secondary data analysis to answer each of the research questions. Positive and negative correlation provides information on the type of

relationship between the variables being examined (Bewick, Cheek, & Ball, 2003). Cross-sectional analysis can potentially identify if household structure, as an element of nonprofessional support, provides adequate social-emotional support for mental well-being in reproductive-age women. If a relationship exists between certain household structures and frequency of mental distress, with mediation from social-emotional support, then risk based on the household structure that provides inadequate social-emotional support could be identified to support the need for supplementation of community programs with nonprofessional support strategies. I aligned the research design with SEM constructs and assessed individual-level health at the relationship-level to determine the need for community-level intervention. Owing to the use of secondary data, no time or resource constraints existed for data collection. The design choice relates to current literature and can be easily replicated or advanced by future researchers and public health practitioners (Bethea et al., 2012; Farr & Bish, 2013; Huot et al., 2013; Xaverius & Salas, 2013). The BRFSS provided easy-to-access data to analyze as part of the research design.

Methodology

To statistically analyze study data, I used the Pearson's correlation coefficient, *r*, and linear regression. Pearson's correlation coefficient determined the strength of the relationship between household structure, social-emotional support, and frequency of mental distress. Pearson's correlation coefficient provides information about the effect size between the variables, which can also be understood as the total variance (Field, 2013). Although Pearson's correlation coefficient is not linear, it does provide

information on the scale of effect size ranging between 0 and 1 (Field, 2013). This information can be very useful in conjunction with linear regression. Linear regression involves use of a scatterplot to graphically represent the relationship between the variables (Bewick et al., 2003). I used a best-fit line to determine if household structure positively or negatively correlates with frequency of mental distress and social-emotional support. Archival data, in the form of a national survey conducted by the CDC (2013), was readily available in statistical format online with the necessary variables for analysis in this study. Clarity regarding the population, sampling strategy, and archival data instrumentation was essential to understanding the methodology.

Population

Selection criteria was used for this study based on current literature on the issue of mental health challenges for reproductive-age women. The population for this study was reproductive-age women, which are defined as 18–44 years of age in the supporting literature, and target sample size was 134 for Pearson's correlation coefficient and 166 for linear regression. The BRFSS provides the tools necessary to further analyze this population based on the specified sampling parameters of the survey, which can be aligned with this study using the selection criteria of women 18–44 years. In the BRFSS Section 12 titled "Demographics" (CDC, 2011a, pp. 16, 23), questions 12.1 and 12.19 determine the age and gender of the survey participant. Analysis using BRFSS allowed for additional selection of all variables of interest, which are independent, dependent, mediating, and confounding. Knowledge of the complexity of the sampling parameters outlined by the CDC (2011d) was integral for data analysis.

Sampling and Sampling Procedures

I statistically analyzed the 2010 BRFSS. The sampling strategy for the 2010 BRFSS was a probability sample design using data collection from 54 states and territories of the United States (CDC, 2011d). In 2010, there were 50 states and one territory that used a disproportionate stratified sample design, and three territories used a simple random sample design (CDC, 2011d). Both of these designs met the specified criterion from the CDC for probability sampling. Stratified samples provide a more accurate data pool of the sampled population by ensuring appropriate representation of various groups in the population (Frankfort-Nachmias & Nachmias, 2008e). Stratified sampling reduces the size for quantitative research by allowing the researcher to associate data into specified groups, which was a benefit when compared to simple random sampling (Frankfort-Nachmias & Nachmias, 2008e). The disproportionate sampling strategy used for the BRFSS relates to a variation in total number of participants per stratum and should be used for comparison of two or more variables (Frankfort-Nachmias & Nachmias, 2008e). The research design and methodology for this study follows the guidelines for a disproportionate sampling strategy by analyzing multiple variables in the BRFSS to determine if there was a relationship.

The data for BRFSS needed for the sample was readily available for download from the CDC (2011a) in SPSS format for statistical analysis using Pearson's correlation coefficient and linear regression. BRFSS is a telephone survey and was analyzed using record identification and core sections 2, 3, 12, and 22 (CDC, 2011a). Only one person per household is used for data collection (CDC, 2011d). During initial selection of the

survey participant, called record identification, the interviewer conducts a random adult selection by ensuring the person on the phone is 18 years or older (CDC, 2011a). During record identification, the interviewer determines how many of the adults in the household are men and women (CDC, 2011a). This initial interaction with the survey participant provides information at the relationship-level through questions that identify factors needed for the independent variable, household structure. There are several BRFSS core section questions of the BRFSS for which the interviewer methodically collected data.

Section 2 is titled "Healthy Days —Health-Related Quality of Life" (CDC, 2011a, p. 9) and was used for the dependent variable, frequency of mental distress. For Question 2.2, the survey participant provided the number of days in a 30-day period they experienced mental distress. Mental distress is defined as stress, depression, and problems with emotions (CDC, 2011a). Other core sections that were used for statistical analysis relate to the confounding and mediating variables. Confounding variables affect both the independent and dependent variables. The potential confounding variables for this study were selected based on the literature review. In Question 3.3 of Section 3 titled "Health Care Access" (CDC, 2011a, p. 11), the interviewer asks if health care access has been hindered in the past year due to cost. Questions 12.2, 12.4, 12.6, 12.7, 12.10, and 12.20 in Section 12 titled "Demographics" (CDC, 2011a, pp. 17–19, 23) are other potential confounding variables, where the interviewer determines race, income, marital status, number of children in the household, and pregnancy status, respectively. Statistical analysis must adjust for any of these variables that prove to be confounding to

ensure they are not threatening internal validity. Another variable that needs further statistical examination was the mediating variable.

An important mediating variable that deserved statistical examination was social-emotional support. The mediator, social-emotional support, in relation to the independent variable, household structure, could affect the dependent variable, frequency of mental distress. Social-emotional support was provided in the BRFSS in Section 22 "Emotional Support and Life Satisfaction" (CDC, 2011a, p. 35) through Question 22.1. Once these variables are identified in the BRFSS and classified by type, the confirmation of parametric testing through Pearson's correlation coefficient and linear regression was used to determine sample size (Field, 2013; Frankfort-Nachmias & Nachmias, 2008b; Murray, 2013).

In calculating the sample size, *G*Power* is an effective tool using power to determine sample size (Field, 2013). Pearson's correlation coefficient and linear regression were used to test statistical significance, using a p value < .05. In *G*Power*, the t test for "Correlation: Point biserial model" setting was selected with a significance level (α) of 5% and a power level ($1-\beta$) of 95% to determine the sample size for Pearson's correlation coefficient. The sample size can be determined using the "A priori: Compute required sample size – given α, power, and effect size" setting for the type of power analysis in *G*Power*. For analysis with two tails and an effect size $|\rho|$ of 0.3, the sample size needed from the BRFSS was 134. Other output parameters were noncentrality parameter δ of 3.6404323, critical t of 1.9781, and 132 degrees of freedom. The actual power was determined as 0.9509217.

To determine sample size for linear regression in *G*Power*, the F test for "Linear multiple regression: Fixed model, R^2 deviation from zero" setting was selected with a significance level (α) of 5% and a power level ($1-\beta$) of 95%. The sample size can be determined using the "A priori: Compute required sample size – given α, power, and effect size" setting for the type of power analysis. For analysis with an effect size f^2 of 0.15 and 9 as the number of predictors, the sample size needed from the BRFSS was 166. Other output parameters were critical F of 1.94035, numerator degrees of freedom as 9 and denominator degrees of freedom as 156. The actual power was determined as 0.9500973. Based on the sample size output from *G*Power* for both Pearson's correlation coefficient and linear regression, the sample size required was a minimum of 166 since it was the larger of the two outputs. Choosing the appropriate instrument for this study provides the ability for adequate sample size and replication by researchers and practitioners.

Instrumentation

In 1984, the CDC (2015a) developed the instrumentation that was used in this study, which is a national survey conducted annually. The BRFSS is the largest survey in the United States using multiple methods for data collection, which are landline and cellular telephones. In a majority of states, interviewers of the BRFSS are the only ones collecting information about chronic diseases (CDC, 2015a). It has been used by researchers in similar type studies, such as Willet et al.'s (2012) analysis of the relationship of mental health factors and routine wellness visits in reproductive-age women. Other related studies where researchers used the BRFSS were discussed in

Chapter 2 and include Bethea et al. (2012), Farr and Bish (2013), Huot et al. (2013), and Xaverius and Salas (2012). The CDC (2011d) uses state health departments for assisting with survey development and facilitation of the interviews.

Questions used by the BRFSS are reviewed annually to maintain the validity and reliability of the survey. VitalNet (2012) is the health data analysis software used to ensure reliability of the BRFSS. This software correctly analyzes the weighted data from the BRFSS, maintains internal consistency, and allows for feasibility of use by researchers. Systematic review of the BRFSS by Pierannunzi, Hu, and Balluz (2013) for reliability and validity showed equality to other national surveys for use in research. Some of the questions in the BRFSS are pulled from the National Health Interview Survey and National Health and Nutrition Examination Survey, where the questions have already undergone testing (CDC, 2011d). Any added questions undergo cognitive and field tests prior to voting from state representatives for their adoption into the BRFSS (CDC, 2011d). State health departments then agree to use the core questions without modification. The use of additional modules and state questions are optional and must be completed after the core sections. Collected data is consolidated at the CDC for processing and dissemination of reports. During data processing, the CDC uses ranking of demographic information to ensure underrepresented populations are weighted appropriately in the published dataset. Although developers of the BRFSS ensure the information is valid and reliable for use by researchers (CDC, 2015a), it was important to understand the threats to validity related to the methodology chosen for this study.

Threats to Validity

In the design of this study, external, internal, construct, and statistical validity are integral factors for consideration to ensure reliability of the study. The cause and effect relationship between household structure and frequency of mental distress cannot be verified, which challenges the external validity of the results. The focus on correlational analysis demonstrates this limitation. Internal validity may be limited by content and empirical validity, since the BRFSS was not specifically designed for this study and participants may respond with bias (Frankfort-Nachmias & Nachmias, 2008c, 2008e). For each question, the interviewer has specific instructions on what to read, when to read additional information to prompt coded response options, and what code to input when the participant does not know or refuses to respond. The first research question in this study examined if a relationship existed between household structure and frequency of mental distress. Considerations of the potential different types of variables that affect the relationship between the independent and dependent variables, household structure and frequency of mental distress, may help researchers reduce threats to internal validity.

The confounding variables of interest are health care access, race, income, marital status, number of children in the household, and pregnancy status. Based on the literature review, the health care access question in relation to cost was a potential confounding variable because of its relation to frequency of mental distress, where health care professionals are a potential source of intervention in mental well-being of reproductive-age women. The inclusion of cost in the health care access Question 3.3 also affects household structure by including monetary considerations. In the literature review, there

were variations among reproductive and mental health outcomes for different racial groups, where Black women were the most disadvantaged. Different ethnicities could also affect household structure due to cultural variances between groups that may affect living conditions. Another prevalently disadvantaged group in the literature review in relation to frequency of mental distress was reproductive-age women with low income. Income also has an impact on household structure due to monetary needs associated with living in a home. Marital status and number of children in the household affect both household structure and frequency of mental distress. Another potential confounding variable was pregnancy status, where women who are pregnant have regular health care access, which could affect their frequency of mental distress. Pregnancy status may also impact household structure by changing the atmosphere of the home environment. Threats to internal validity by confounding variables include an increase in variance between the independent and dependent variables and potential bias in the results.

Stratified analyses can be used to control for potential bias caused by the variation in the age range of the controlled variable and by adjusting for confounding variables. Stratification of age occurred in three groups based on BRFSS collection measures: “18–24 years”, “25–34 years”, and “35–44 years”. The confounding variables were adjusted through stratification based on data collection measures and their relation to the study. Health care coverage and pregnancy status were “yes” or “no” categories. Income was stratified as “< $15,000”, “$15,000–$24,999”, “$25,000–$49,999”, and “≥ $50,000”. Racial groups were organized as “Black”, “Hispanic”, “White”, and “Other”. Marital status was dichotomized into “married” or “not married”, where codes 2–6 were

combined for categorization of “not married”. Number of children in the household was a continuous confounding variable and was stratified into four groups, defined as “0”, “1–2”, “3–4”, “> 4”. Mediating variables associated with understanding the relationship between household structure and frequency of mental distress must also be considered.

The second research question was designed to understand if adequate social-emotional support acts as a mediating variable between household structure and frequency of mental distress. Social-emotional support was a continuous measurement due to the Likert-scale responses. The responses that were statistically analyzed for the survey question, “How often do you get the social and emotional support you need?”, are “always”, “usually”, “sometimes”, “rarely”, and “never”. Research question three culminates with determining if a particular household structure provides more positive social-emotional support for mental health. Table 3 and Figure 2 provide an overview for the variables of interest associated with the research questions. Table 3 shows each variable based on its type and measurement.

Table 3

Variables of Interest for Understanding the Relationship Between Household Structure and Frequency of Mental Distress in Reproductive-Age Women

Variable Type	Variable	Measurement
Dependent	Frequency of mental distress	Continuous
Independent	Household structure	Continuous
Covariate	No. men	
	No. women	
Mediating	Adequate social-emotional support	Continuous
Confounding	Health Care Access	Categorical
	Race	Categorical
	Income	Categorical
	Marital Status	Categorical
	# Children Home	Continuous
	Pregnancy Status	Categorical

Figure 2 shows a visual depiction of the relationships between independent, dependent, mediating, and confounding variables. The research questions are aligned in the figure based on their role in providing information about these relationships. The aim of research question three was to determine if research questions one and two provided enough information to understand if a particular household structure promotes positive mental health through the provision of adequate social-emotional support. The alignment of variables and research questions was an important component for reducing threats to validity. The large sample size of the BRFSS was another component to help increase the validity of this study by answering the research questions with sufficient data.

The BRFSS provides a large sample size that can be used for statistical analysis, reducing threats to construct and statistical validity. The designated independent and

dependent variables align with the constructs of the SEM, which supports the potential social impact the statistical outcome of this study could provide. The large dataset allows for missing data to be eliminated during statistical analysis and the BRFSS dataset was organized for SPSS input (Frankfort-Nachmias & Nachmias, 2008e). The use of the BRFSS minimizes the ethical considerations of this study.

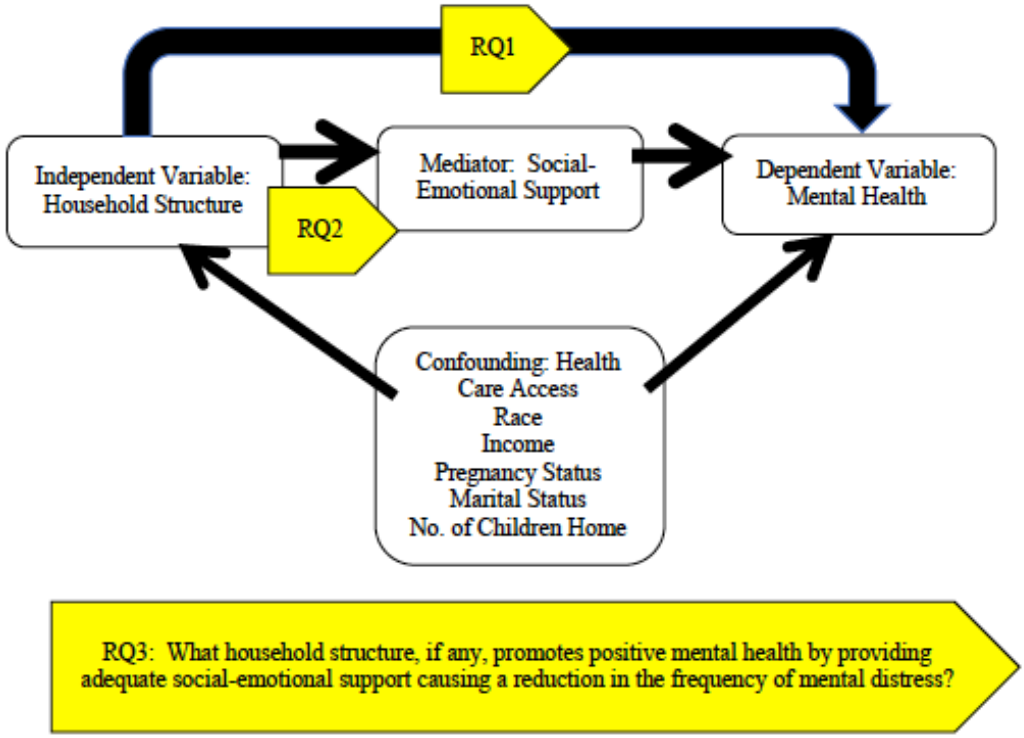

Figure 2. Research questions and associated variables in understanding the relationship between household structure and frequency of mental distress.

Ethical Procedures

The BRFSS was readily available in SPSS format online and is anonymous to protect the privacy rights of the study participants. Permission to use the data were

obtained by the Institutional Review Board prior to statistical analysis. All results are reported in an objective fashion to prevent the potential for misleading information.

Summary

In this chapter, I have discussed factors associated with the quantitative research design and use of the BRFSS for the methodology. The population, sampling considerations, and instrumentation were described in detail. Although threats to validity exist, the large sample size, validated instrument, and appropriate selection of statistical tests for answering the research questions reduces the impact of these threats. Institutional Review Board approval ensured all ethical considerations have been thoroughly exhausted, where the anonymity of the BRFSS prevents harm to the study participants. In Chapter 4, I provide the results of the statistical analyses in order to determine if a relationship exists between household structure and frequency of mental distress in reproductive-age women. These results can be used to determine the potential of this study for social impact and advancement of knowledge in the field of public health.

Chapter 4: Results

Introduction

Approximately half of all pregnancies in the United States are unintended (Guttmacher Institute, 2016); poor mental health in reproductive-age women increases the risk for unintended pregnancy (Bayrampour et al., 2015; Hall et al., 2013, 2014, 2015a). According to Farr and Bish (2013), the risk indicators for mental health problems in reproductive-age women should continue to be investigated due to the large amount of supporting literature that discusses the negative impact of poor mental health on the population (see Allen et al., 2014; Altman et al., 2015; Bayrampour et al., 2015; Bloch et al., 2010; Bloom et al., 2012; El-Mohandes et al., 2011; Guttmacher Institute, 2016; Hall et al., 2013, 2014, 2015a; Huot et al., 2013; Ko et al., 2013; Molina & Alcantara, 2013; Page et al., 2012; Pratt et al., 2011; Schwarz et al., 2o12; Smith & Kruse-Austin, 2014; Taft et al., 2011; Wen et al., 2012; Willet et al., 2012; Witt et al., 2012). In this study, I focused on analyzing the mediation of social-emotional support in the relationship between household structure and frequency of mental distress. The purpose of this quantitative correlational study was to examine the relationship between household structure and frequency of mental distress, with consideration of the mediation social-emotional support provides. The research questions were

RQ1: What is the relationship, if any, between household structure and frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status?

$H_0$1. There is no relationship between household structure and frequency of

mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

H_A1. There is a relationship between household structure and frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

RQ2: What is the relationship, if any, between household structure and adequate social-emotional support, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status?

H_02. There is no relationship between household structure and adequate social-emotional support, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

H_A2. There is a relationship between household structure and adequate social-emotional support, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

RQ3: What household structure, if any, promotes positive mental health by providing adequate social-emotional support causing a reduction in the frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status?

$H_0$3. There is no household structure that promotes positive mental health by providing adequate social-emotional support causing a reduction in the frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

H_A3. There is a household structure that promotes positive mental health by providing adequate social-emotional support causing a reduction in the frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

In Chapter 4, I provide information on the data collection procedures and present results from the statistical analysis of the research questions. I used Pearson's correlation coefficient and linear regression to gain a greater understanding of the relationship between the independent, dependent, mediating, and confounding variables.

Data Collection

I used the 2010 BRFSS for data analysis with a total of 65,268 participants in the sample after data cleaning was completed. Data cleaning included removing all samples that were male and only included women aged 18–44 years. For levels of measurement, gender was coded as scale with only women (coded as *2*) in the samples that were analyzed. Social-emotional support was changed to scale so it could be analyzed as a continuous variable based on it being recorded using a Likert scale. Mental distress, number of adults, number of men, and number of women were coded as scale levels of

measurement. Health care access and pregnancy status were nominal categorical measures. Age, race, income, marital status, and number of children in the household were coded as ordinal measures. Stratification of these variables was as follows: age groups 18–24 years, 25–34 years, and 35–44 years; income groups < $15,000, $15,000–$24,999, $25,000–$49,999, and ≥ $50,000; racial groups Black, Hispanic, White, and other; and number of children in the household 0, 1–2, 3–4, > 4. Missing data were kept in the data set, but codes for "don't know" and "refused to answer" were removed. Owing to the large size of the data set, removing or merging categories posed no threat to external validity, and the sample population was proportionately represented.

The covariates of the independent variable, household structure, used in the analysis were number of men and number of women. Basic bivariate analyses with Pearson's correlation coefficient were used to support the inclusion of the covariates for household structure. Although the effect sizes were small, there was a negative correlation between number of adults in the household and the dependent variable, frequency of mental distress. The same negative correlation was found for the mediating variable, adequate social-emotional support. When examining number of adults using the covariate model, number of women in the household had a positive correlation and number of men in the household had a negative correlation for both frequency of mental distress and adequate social-emotional support. The opposite correlations found for both analyses of adult gender in the household with the dependent and mediating variables verified the need to include the covariates for household structure in the analyses, where number of men in the household may have a different impact on mental health than

number of women. Descriptive statistics, evaluation of statistical assumptions, and variable analyses using Pearson's correlation coefficient and linear regression in relation to the research questions and hypotheses are discussed next.

Results

I calculated descriptive statistics for nominal and ordinal variables using frequencies (*n*) and percentages as shown in Table 4. These variables included (a) age, (b) health care access, (c) race, (d) income, (e) marital status, (f) number of children in the household, and (g) pregnancy status. The most frequently observed categories for the nominal and ordinal variables were (a) an age of 35–44 years for 30,399 participants (~47%); (b) health care access as *no* for 51,995 participants (~80%); (c) race as White for 43,548 participants (~67%); (d) an income of ≥ $50,000 for 27,731 participants (~42%); (e) marital status as *married* for 38,337 participants (~59%); (f) number of children in the household as 1–2 for 34,638 participants (~53%); and (g) pregnancy status as *no* for 61,971 participants (~95%).

Table 4

Descriptive Statistics for Nominal and Ordinal Variables

Variable	*n*	%
Age (years)		
35–44	30,399	46.58
25–34	13,547	20.76
18–24	1,945	2.98
Missing	19,377	29.69
Health care access		
No	51,955	79.60
Yes	13,201	20.23
Missing	112	0.17
Race		
White	43,548	66.72
Hispanic	8,654	13.26
Black	7,567	11.59
Other	4,941	7.57
Missing	558	0.85
Income		
≥ $50,000	27,731	42.49
$25,000–$49,999	14,264	21.85
$15,000–$24,999	9,355	14.33
< $15,000	6,776	10.38
Missing	7,142	10.94
Marital status		
Married	38,337	58.74
Not married	26,737	40.96
Missing	194	0.30
No. of children in home		
1–2	34,638	53.07
0	15,845	24.28
3–4	12,950	19.84
> 4	1,581	2.42
Missing	254	0.39
Pregnancy status		
No	61,971	94.95
Yes	2,403	3.68
Missing	894	1.37

Note. Owing to rounding errors, percentages may not equal 100%.

I calculated descriptive statistics for interval and ratio variables using the mean (*M*), standard deviation (*SD*), frequency (*n*), standard error of the mean (SE_M), skewness, and kurtosis shown in Table 5. These variables included (a) frequency of mental distress, (b) number of adults in household, (c) number of men in household, (d) number of women in household, and (e) adequate social-emotional support. The observations were as follows: (a) frequency of mental distress had an average of 4.46 (*SD* = 8.31, SE_M = 0.03, Min = 0.00, Max = 30.00); (b) number of adults in household had an average of 2.02 (*SD* = 0.83, SE_M = 0.00, Min = 1.00, Max = 12.00); (c) number of men in household had an average of 0.80 (*SD* = 0.59, SE_M = 0.00, Min = 0.00, Max = 8.00); (d) number of women in household had an average of 1.22 (*SD* = 0.51, SE_M = 0.00, Min = 0.00, Max = 8.00); and (e) adequate social-emotional support had an average of 1.79 (*SD* = 0.97, SE_M = 0.00, Min = 1.00, Max = 5.00), where the minimum represented "always" and the maximum represented "never."

Table 5

Descriptive Statistics for Interval and Ratio Variables

Variable	*M*	*SD*	*n*	SE_M	Skewness	Kurtosis
Frequency of mental distress	4.46	8.31	64,461	0.03	2.15	3.52
No. adults in household	2.02	0.83	65,268	0.00	1.59	5.82
No. men in household	0.80	0.59	65,267	0.00	0.61	2.85
No. women in household	1.22	0.51	65,267	0.00	2.66	8.84
Adequate social-emotional support	1.79	0.97	62,548	0.00	1.37	1.66

Frequency of mental distress and number of women in household had a skewness less than 2 in absolute value, indicating asymmetry in reference to the mean (Westfall &

Henning, 2013). Frequency of mental distress, number of adults in household, and number of women in household had a kurtosis greater than 3, indicating a distribution significantly different than a normal distribution caused by outliers (Westfall & Henning, 2013). Evaluation of the statistical assumptions and results for Pearson's correlation coefficient are reviewed next.

Pearson's Correlation Coefficient

Pearson's correlation coefficient assumes a linear relationship exists within the bivariate analysis of variables and is violated if curvature appears in the scatterplot (Conover & Iman, 1981). Figures 3–9 show the scatterplots for each analysis with the regression line to verify the assumption of linearity was met. The strength of the relationship was measured using Cohen's standard, where coefficients from .10 to .29 have a small effect size, coefficients from .30 to .49 have a moderate effect size, and coefficients greater than .50 have a large effect size (Cohen, 1988). The critical value was .01 for significance levels of $p < .001$. A total of seven tests were run using Pearson's correlation coefficient, and all effect sizes were small, as shown in Table 6.

Pearson's correlation coefficient (r_p) was first used to determine the need for covariate analysis of the independent variable, household structure, by examining its relationship to the dependent variable, frequency of mental distress. When examining frequency of mental distress and number of adults in household, a significant negative correlation was observed with a small effect size ($r_p = -.04$, $p < .001$; Figure 3). If household structure was examined using the covariates, number of men and number of women in household, the relationship between frequency of mental distress and number

of men in household shows a negative correlation with a small effect size ($r_p = -.08$, $p < .001$; Figure 4), and the relationship between frequency of mental distress and number of women in household shows a positive correlation with a small effect size ($r_p = .03$, $p < .001$; Figure 5). The polar differences between frequency of mental distress and gender of adult in household confirmed the use of the covariates for household structure in this study. These analyses provided initial information in reference to the first research question on the relationship between household structure and frequency of mental distress.

Similar results were found when analyzing the independent variable, household structure, and the mediating variable, adequate social-emotional support, in reference to the second research question. When using Pearson's correlation coefficient to evaluate adequate social-emotional support and number of adults in household, a significant negative correlation was observed with a small effect size ($r_p = -.06$, $p < .001$; Figure 6). If household structure was examined using the covariates, the relationship between adequate social-emotional support and number of men in household shows a negative correlation with a small effect size ($r_p = -.10$, $p < .001$; Figure 7), and the relationship between adequate social-emotional support and number of women in household shows a positive correlation with a small effect size ($r_p = .02$, $p < .001$; Figure 8). Although small effect sizes were present for all tests, polar variances were seen for adequate social-emotional support and gender of adult in the household, confirming the use of covariates, number of men and number of women, for the independent variable, household structure.

The final analysis conducted using Pearson's correlation coefficient was used to analyze the relationship between the mediating variable, adequate social-emotional support, and the dependent variable, frequency of mental distress. A significant positive correlation was observed with a small effect size ($r_p = .28$, $p < .001$; Figure 9). A summary of the results for Pearson's correlation coefficient is shown in Table 6. Although the *p*-values were significant for all, r_p only met Cohen's standard for small effect size in two analyses between the mediating variable, adequate social-emotional support, and the variables number of men in the household and frequency of mental distress. The large sample size and low r_p for the remaining analyses show a weak relationship between the variables, specifically in reference to answering the first research question: What is the relationship, if any, between household structure and frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status? A limitation in using Pearson's correlation was the inability to understand the impact of the confounding variables on the independent, dependent, and mediating variables simultaneously. For this reason, linear regression was the next statistical test used in this study.

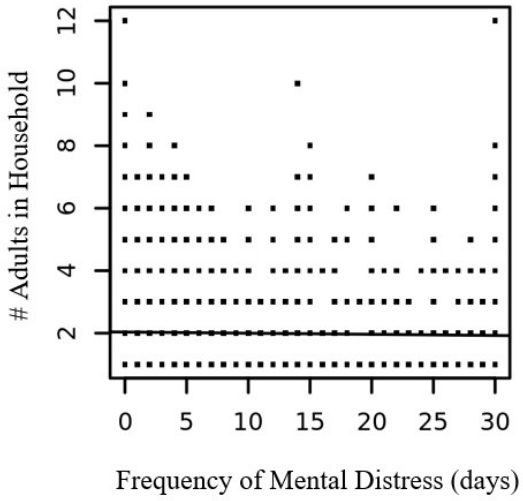

Figure 3. Pearson's correlation coefficient for frequency of mental distress and number of adults in household.

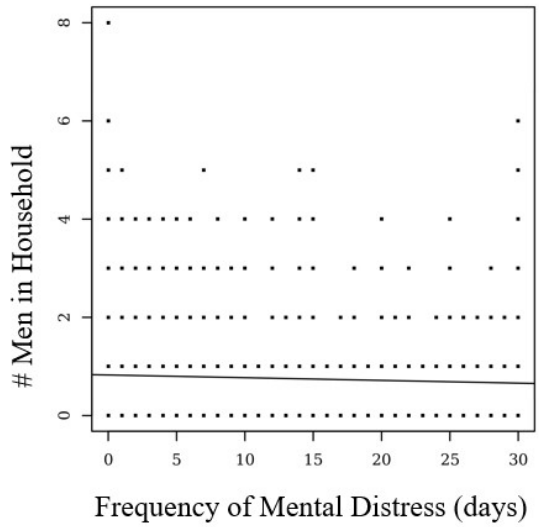

Figure 4. Pearson's correlation coefficient for frequency of mental distress and number of men in household.

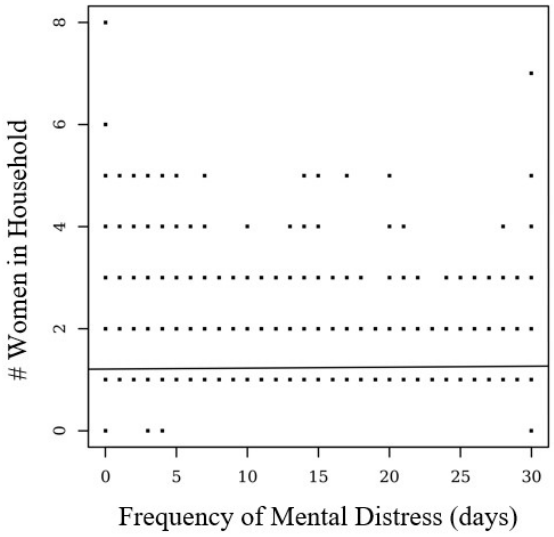

Figure 5. Pearson's correlation coefficient for frequency of mental distress and number of women in household.

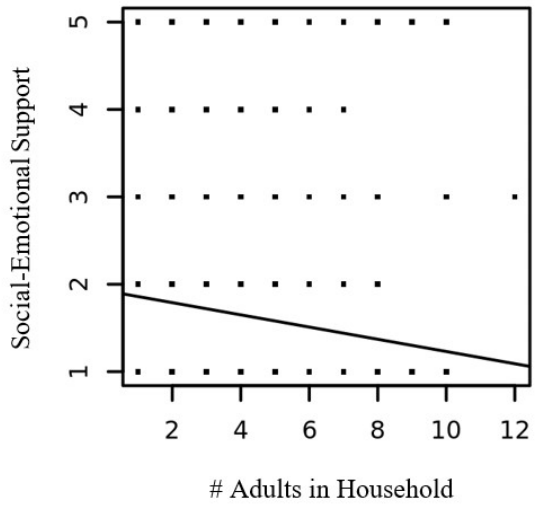

Figure 6. Pearson's correlation coefficient for number of adults in household and adequate social-emotional support.

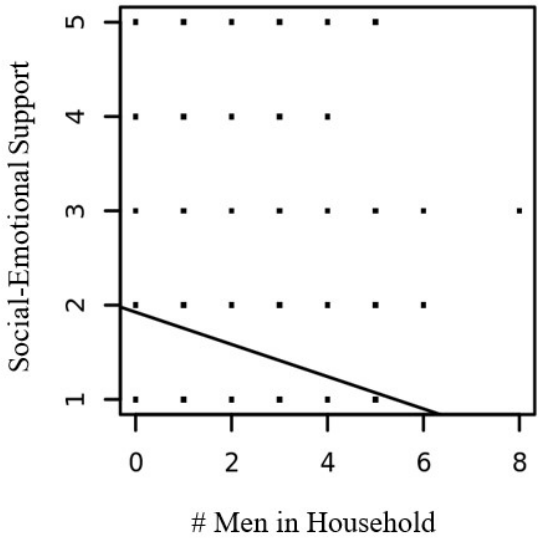

Figure 7. Pearson's correlation coefficient for number of men in household and adequate social-emotional support.

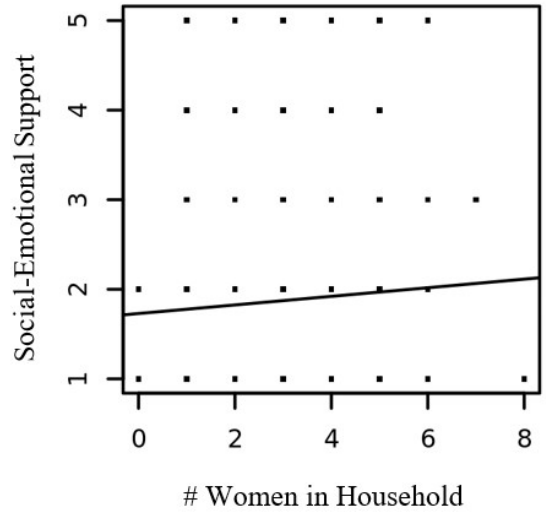

Figure 8. Pearson's correlation coefficient for number of women in household and adequate social-emotional support.

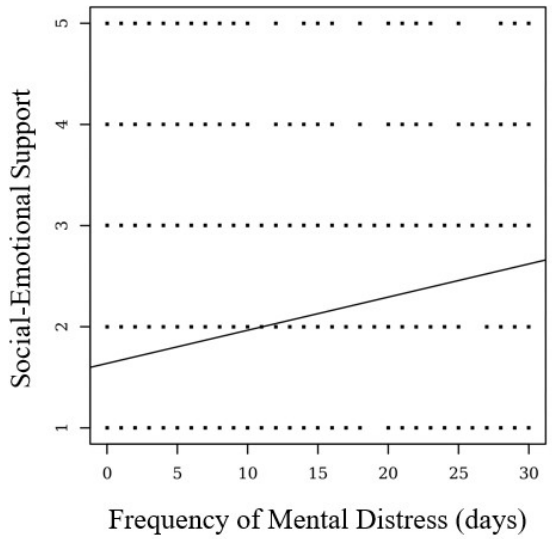

Figure 9. Pearson's correlation coefficient for frequency of mental distress and adequate social-emotional support.

Table 6

Summary of Results for Pearson's Correlation Coefficient

Variable	r_p	p	Cohen's standard
RQ1			
Frequency of mental distress; no. men	−.08	< .001	—
Frequency of mental distress; no. women	.03	< .001	—
RQ2			
Adequate social-emotional support; no. men	−.10	< .001	small effect
Adequate social-emotional support; no. women	.02	< .001	—
Adequate social-emotional support; frequency of mental distress	.28	< .001	small effect
Covariate analysis			
Frequency of mental distress; no. adults	−.04	< .001	—
Adequate social-emotional support; no. adults	−.06	< .001	—

Note. A dash indicates that Cohen's standard is not met.

Assumption Analysis for Linear Regression

When conducting linear regression, the assumptions analyzed were (a) normality of residuals, (b) homoscedasticity of residuals, (c) absence of multicollinearity, and (d) the lack of outliers. The Q-Q scatterplot was used to assess normality of residuals based on normal distribution, which uses the theoretical distribution concept of data points following the bell curve (Bates, Mächler, Bolker, & Walker, 2015; DeCarlo, 1997; Field, 2013). The Q-Q scatterplot in reference to RQ1, as shown in Figure 10, indicates nonnormality and was positively skewed due to most study participants reporting zero days for frequency of mental distress. Owing to the large sample size, the violation of normality has minimal impact on the statistical analysis. The Q-Q scatterplot for RQ2, as shown in Figure 11, showed minimal skewness and followed the assumption for normality of residuals.

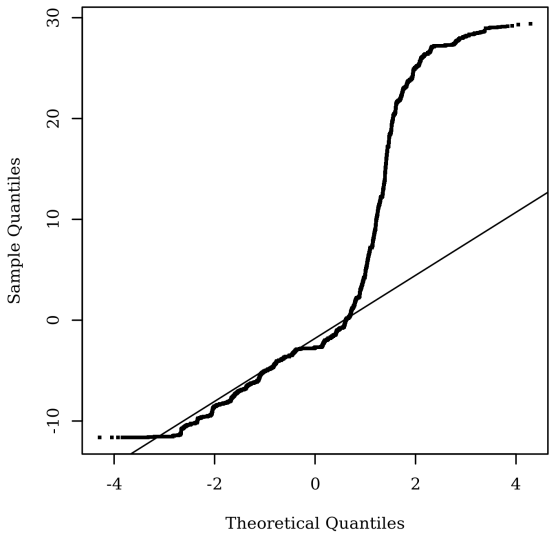

Figure 10. Q-Q scatterplot testing normality of residuals for the dependent variable, frequency of mental distress, with positively skewed nonnormality.

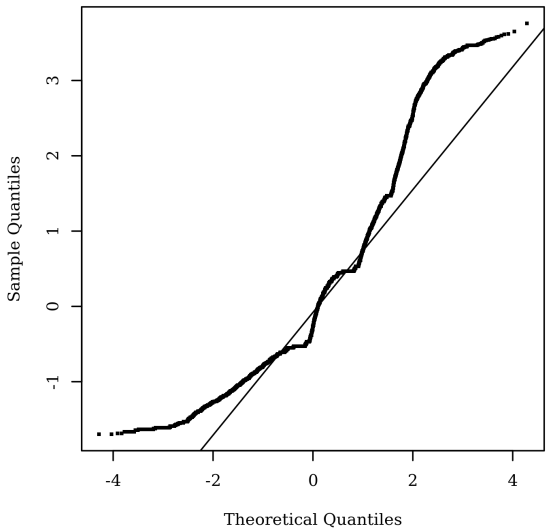

Figure 11. Q-Q scatterplot testing normality of residuals for the mediating variable, adequate social-emotional support, with minimal skewness.

The next assumption tested was homoscedasticity of residuals, where points should appear randomly distributed with a mean of zero and no curvature when residuals are plotted against the predictor (Bates et al., 2015; Field, 2013; Osborne & Walters, 2002). The homoscedasticity of residuals scatterplot for the first research question showed no triangle or cone shape and had diagonal lines due to the categorical variables, as shown in Figure 12. Overall, the data followed the assumption of homoscedasticity of residuals with the predictor, frequency of mental distress. For the second research question, the scatterplot showed discreetness due to the five values associated with the Likert scale of the predictor, adequate social-emotional support, as shown in Figure 13. There was no triangle or cone shape present, and overall, the data met the assumption for homoscedasticity of residuals.

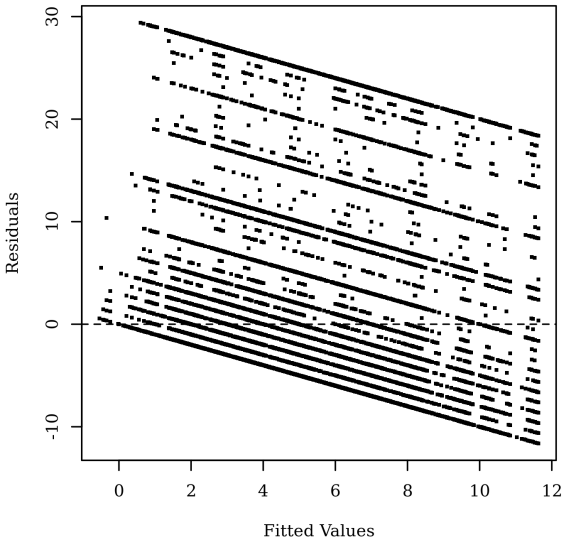

Figure 12. Residuals scatterplot testing homoscedasticity for the predictor frequency of mental distress.

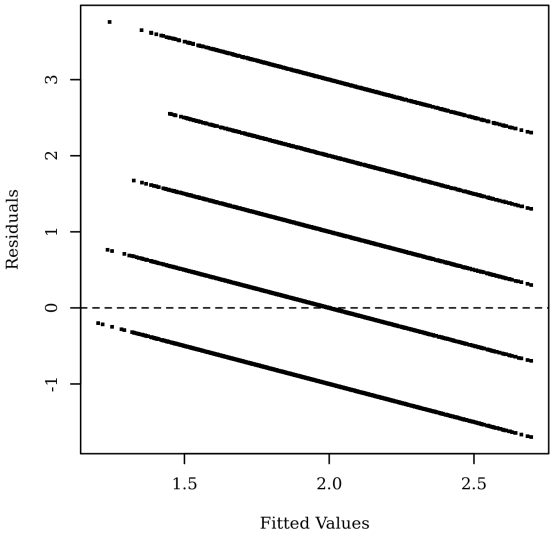

Figure 13. Residuals scatterplot testing homoscedasticity for the predictor adequate social-emotional support.

The absence of multicollinearity between predictors was evaluated using variance inflation factors (VIF), where VIFs greater than 5 indicate a potential problem with the

model and VIFs equal to 10 should be the maximum level allowed (Menard, 2010). When analyzing the absence of multicollinearity for RQ1, all VIFs were less than 2, as shown in Table 7, indicating that the assumption was met. Table 8 provides the VIFs for the second research question, where the assumption of the absence of multicollinearity was met, with all VIFs less than 2.

Table 7

Variance Inflation Factors for the Independent and Confounding Variables in Relation to the Dependent Variable Frequency of Mental Distress

Variable	VIF
Independent variable	
No. men	1.45
No. women	1.18
Confounding variable	
Health care access	1.13
Race	1.20
Income	1.47
Pregnancy status	1.01
Marital status	1.85
No. children home	1.11

Table 8

Variance Inflation Factors for the Independent and Confounding Variables in Relation to the Mediating Variable Adequate Social-Emotional Support

Variable	VIF
Independent variable	
No. men	1.45
No. women	1.18
Confounding variable	
Health care access	1.13
Race	1.20
Income	1.47
Pregnancy status	1.01
Marital status	1.85
No. children home	1.11

The assumption for linear regression, lack of outliers, was assessed by calculating Studentized residuals with absolute values plotted against the observation numbers to help identify any outliers that exist in the data. To calculate Studentized residuals, the model residuals were divided by the estimated residual standard deviation (Fields, 2013; Stevens, 2016). For the first research question, the Studentized residual was > 3.09 in absolute value with a 0.999 quartile of a *t* distribution and 56,351 degrees of freedom. For the second research question, the Studentized residual was > 3.09 in absolute value with a 0.999 quartile of a *t* distribution and 55,300 degrees of freedom. A Studentized residual greater than 3 was considered to have significant influence on the results. Figures 14 and 15 show the Studentized residuals plot of the observations for the first and second research question, respectively. Owing to the large sample size, the outliers pose no concern to the validity of using linear regression for statistical analysis. The assumptions

for linear regression showed minimal threats to validity and were of little cause for concern due to the large sample size. The results for linear regression are now discussed.

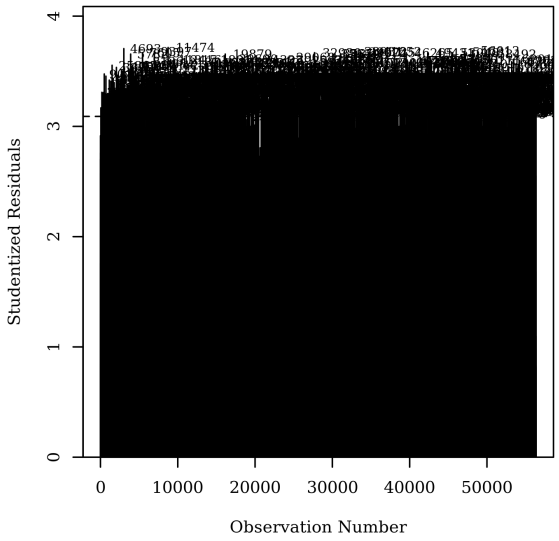

Figure 14. Studentized residuals plot for outlier detection for the dependent variable, frequency of mental distress.

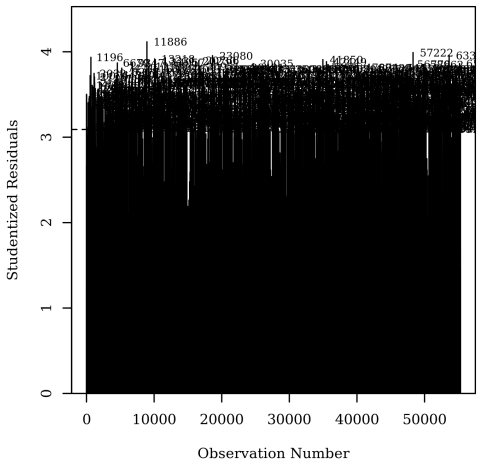

Figure 15. Studentized residuals plot for outlier detection for the mediating variable, adequate social-emotional support.

RQ1: Household Structure and Mental Distress

For the first research question, linear regression showed significant results, $F(14,56337) = 361.45$, $p < .001$, $R^2 = 0.08$, where 8% of the variance in frequency of mental distress was explainable by number of men, number of women, health care access, race, income, marital status, number of children in the household, and pregnancy status. After further review, the independent variable, household structure, did not show a significant relationship to the dependent variable, frequency of mental distress, after controlling for the confounding variables. Table 9 summarizes the results for linear regression evaluating the relationship between household structure and frequency of mental distress when controlling for confounding variables.

The covariate of household structure, number of men, did not significantly predict frequency of mental distress, $B = -0.10$, $t(56337) = -1.51$, $p = .130$. The covariate of household structure, number of women, did not significantly predict frequency of mental distress, $B = -0.05$, $t(56337) = -0.67$, $p = .501$. Based on this sample, a one-unit increase in number of men or women did not have a significant effect on frequency of mental distress.

With the exception of number of children in the household, all confounding variables showed significance in relation to frequency of mental distress. For health care access, the response "no" significantly predicted frequency of mental distress, $B = -3.31$, $t(56337) = -37.50$, $p < .001$, which suggests that reproductive-age women moving from health care access being hindered by cost to health care access not being hindered by cost

will prompt a decrease in frequency of mental distress by an average of 3.31 days per 30-day period.

For race, the response "other" significantly predicted frequency of mental distress, $B = -0.79$, $t(56337) = -6.03$, $p < .001$, which suggests that frequency of mental distress decreases by 0.79 days per 30-day period on average, in comparison to White reproductive-age women, for reproductive-age women of races other than Black, Hispanic, and White. The response "Black" significantly predicted frequency of mental distress, $B = -1.27$, $t(56337) = -11.44$, $p < .001$, which suggests that frequency of mental distress decreases by 1.27 days per 30-day period on average for Black compared to White reproductive-age women. The response "Hispanic" significantly predicted frequency of mental distress, $B = -1.82$, $t(56337) = -17.06$, $p < .001$, which suggests that frequency of mental distress decreases by 1.82 days per 30-day period on average for Hispanic compared to White reproductive-age women.

For income, the response "$15,000–$24,999" significantly predicted frequency of mental distress, $B = -1.97$, $t(56337) = -15.13$, $p < .001$, which suggests that annual household income for reproductive-age women increasing from less than $15,000 to $15,000–24,999 will decrease the frequency of mental distress by an average of 1.97 days per 30-day period. The response "$25,000–$49,999" significantly predicted frequency of mental distress, $B = -3.46$, $t(56337) = -27.84$, $p < .001$, which suggests that annual household income for reproductive-age women increasing from less than $15,000 to $25,000–$49,999 will decrease the frequency of mental distress by an average of 3.46 days per 30-day period. The response "≥ $50,000" significantly predicted frequency of

mental distress, $B = -4.26$, $t(56337) = -34.08$, $p < .001$, which suggests that annual household income for reproductive-age women increasing from less than $15,000 to equal to or greater than $50,000 will decrease the frequency of mental distress by an average of 4.26 days per 30-day period.

For marital status, not being married significantly predicted frequency of mental distress, $B = 1.07$, $t(56337) = 11.51$, $p < .001$, suggesting that reproductive-age women who change their marital status from married to not married will increase the frequency of mental distress an average of 1.07 days per 30-day period. For pregnancy status, moving from "yes" to "no" significantly predicted frequency of mental distress, $B = 1.31$, $t(56337) = 7.46$, $p < .001$, suggesting that reproductive-age women who are not pregnant will have an increase in the frequency of mental distress an average of 1.31 days per 30-day period.

The confounding variable, number of children in the household, did not show significance to frequency of mental distress. Increasing the number of children in the household did not significantly predict frequency of mental distress compared to having no children in the home, where results were 1–2 children, $B = -0.10$, $t(56337) = -1.14$, $p = .252$; 3–4 children, $B = -0.19$, $t(56337) = -1.84$, $p = .065$; and > 4 children, $B = -0.05$, $t(56337) = -0.20$, $p = .839$. The null hypothesis, "There is no relationship between household structure and frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status," must be accepted based on the results from linear regression, summarized in Table 9. Linear regression for the independent variable,

household structure, and the mediating variable, adequate social-emotional support, was analyzed for the second research question.

Table 9

Results for Linear Regression With Household Structure and Confounding Variables Predicting Frequency of Mental Distress

Variable	*B*	*SE*	95% CI	β	*t*	*p*
(Intercept)	9.31	0.25	[8.83, 9.79]	0.00	37.89	< .001
Independent						
No. men	−0.10	0.07	[−0.24, 0.03]	−0.01	−1.51	.130
No. women	−0.05	0.08	[−0.20, 0.10]	−0.00	−0.67	.501
Confounding						
Health care access “no”	−3.31	0.09	[−3.48, −3.14]	−0.16	−37.50	< .001
Race other	−0.79	0.13	[−1.04, −0.53]	−0.02	−6.03	< .001
Race Black	−1.27	0.11	[−1.49, −1.05]	−0.05	−11.44	< .001
Race Hispanic	−1.82	0.11	[−2.03, −1.61]	−0.07	−17.06	< .001
Income $15,000–$24,999	−1.97	0.13	[−2.22, −1.71]	−0.09	−15.13	< .001
Income $25,000–$49,999	−3.46	0.12	[−3.71, −3.22]	−0.18	−27.84	< .001
Income ≥ $50,000	−4.26	0.13	[−4.51, −4.02]	−0.26	−34.08	< .001
Marital status “not married”	1.07	0.09	[0.89, 1.25]	0.06	11.51	< .001
Pregnancy status “no”	1.31	0.18	[0.97, 1.65]	0.03	7.46	< .001
No. children home 1–2	−0.10	0.09	[−0.27, 0.07]	−0.01	−1.14	.252
No. children home 3–4	−0.19	0.11	[−0.40, 0.01]	−0.01	−1.84	.065
No. children home > 4	−0.05	0.23	[−0.49, 0.40]	−0.00	−0.20	.839

Note. $F(14,56337) = 361.45$, $p < .001$, $R^2 = .08$.

RQ2: Household Structure and Social-Emotional Support

For the second research question, linear regression showed significant results, $F(14,55286) = 392.29$, $p < .001$, $R^2 = .09$, where 9% of the variance in adequate social-emotional support was explainable by number of men, number of women, health care access, race, income, marital status, number of children in the household, and pregnancy status. Table 10 summarizes the results for linear regression evaluating the relationship

between household structure and adequate social-emotional support when controlling for confounding variables. All variables showed significance of $p < .001$ in relation to adequate social-emotional support. Adequate social-emotional support data were recorded using a 5-point Likert scale ranging from 1 (*always*) to 5 (*never*). In reference to the method of data coding, positive values equal a lower level of social-emotional support, and vice versa.

Both covariates of the independent variable, household structure, suggested an improvement in adequate social-emotional support for reproductive-age women with a higher number of men, $B = -0.04$, $t(55286) = -5.33$, $p < .001$, or women, $B = -0.03$, $t(55286) = -3.66$, $p < .001$, in the household. On average, adding one man to the household will decrease the mean of adequate social-emotional support by −0.04, and adding one woman will decrease the mean of adequate social-emotional support by −0.03. Based on the analysis using linear regression for RQ2, the null hypothesis was rejected and the alternate hypothesis, "There is a relationship between household structure and adequate social-emotional support, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status," was accepted.

For health care access, the response "no" significantly predicted adequate social-emotional support, $B = -0.35$, $t(55286) = -33.57$, $p < .001$, which suggests that reproductive-age women moving from health care access being hindered by cost to health care access not being hindered by cost will have an improvement in adequate social-emotional support by decreasing the mean 0.35 units.

For race, the response "other" significantly predicted adequate social-emotional support, $B = 0.13$, $t(55286) = 8.82$, $p < .001$, in comparison to White reproductive-age women. This analysis suggests that there will be a decrease in adequate social-emotional support by 0.13 on average for reproductive-age women of races other than Black, Hispanic, and White. The response "Black" significantly predicted adequate social-emotional support, $B = 0.08$, $t(55286) = 6.13$, $p < .001$, which suggests that there will be a decrease in adequate social-emotional support by 0.08 on average for Black compared to White reproductive-age women. The response "Hispanic" significantly predicted adequate social-emotional support, $B = 0.06$, $t(55286) = 4.80$, $p < .001$, which suggests that there will be a decrease in adequate social-emotional support by 0.06 on average for Hispanic compared to White reproductive-age women.

For income, the response "$15,000–$24,999" significantly predicted adequate social-emotional support, $B = -0.22$, $t(55286) = -14.45$, $p < .001$, which suggests that annual household income for reproductive-age women increasing from less than $15,000 to $15,000–24,999 will improve adequate social-emotional support by decreasing the mean 0.22 units. The response "$25,000–$49,999" significantly predicted adequate social-emotional support, $B = -0.37$, $t(55286) = -25.65$, $p < .001$, which suggests that annual household income for reproductive-age women increasing from less than $15,000 to $25,000–$49,999 will improve adequate social-emotional support by decreasing the mean 0.37 units. The response "≥ $50,000" significantly predicted adequate social-emotional support, $B = -0.45$, $t(55286) = -30.85$, $p < .001$, which suggests that annual household income for reproductive-age women increasing from less than $15,000 to

equal to or greater than $50,000 will improve adequate social-emotional support by decreasing the mean 0.45 units.

For marital status, not being married significantly predicted adequate social-emotional support, $B = 0.16$, $t(55286) = 14.83$, $p < .001$, suggesting that reproductive-age women who change their marital status from married to not married will have a decrease in adequate social-emotional support an average of 0.16 units. For pregnancy status, moving from "yes" to "no" significantly predicted adequate social-emotional support, $B = 0.14$, $t(55286) = 7.09$, $p < .001$, suggesting that reproductive-age women who are not pregnant will have a decrease in adequate social-emotional support an average of 0.14 units. Having an increasing number of children in the household significantly predicted adequate social-emotional support compared to having no children in the home, where results were 1–2 children, $B = 0.06$, $t(55286) = 6.08$, $p < .001$; 3–4 children, $B = 0.08$, $t(55286) = 6.67$, $p < .001$; and > 4 children, $B = 0.10$, $t(55286) = 3.59$, $p < .001$. These results suggest a decrease in adequate social-emotional support with an increase in children in the household an average of 0.06, 0.08, and 0.10 units, respectively.

Table 10

Results for Linear Regression With Household Structure and Confounding Variables Predicting Adequate Social-Emotional Support

Variable	*B*	*SE*	95% CI	β	*t*	*p*
(Intercept)	2.20	0.03	[2.14, 2.25]	0.00	76.79	< .001
Independent						
No. men	−0.04	0.01	[−0.06, −0.03]	−0.03	−5.33	< .001
No. women	−0.03	0.01	[−0.05, −0.02]	−0.02	−3.66	< .001
Confounding						
Health care access “no”	−0.35	0.01	[−0.37, −0.33]	−0.14	−33.57	< .001
Race other	0.13	0.02	[0.10, 0.16]	0.04	8.82	< .001
Race Black	0.08	0.01	[0.05, 0.11]	0.03	6.13	< .001
Race Hispanic	0.06	0.01	[0.04, 0.08]	0.02	4.80	< .001
Income $15,000–$24,999	−0.22	0.02	[−0.25, −0.19]	−0.08	−14.45	< .001
Income $25,000–$49,999	−0.37	0.01	[−0.40, −0.34]	−0.17	−25.65	< .001
Income ≥ $50,000	−0.45	0.01	[−0.48, −0.42]	−0.23	−30.85	< .001
Marital status “not married”	0.16	0.01	[0.14, 0.18]	0.08	14.83	< .001
Pregnancy status “no”	0.14	0.02	[0.10, 0.18]	0.03	7.09	< .001
No. children home 1–2	0.06	0.01	[0.04, 0.08]	0.03	6.08	< .001
No. children home 3–4	0.08	0.01	[0.06, 0.11]	0.03	6.67	< .001
No. children home > 4	0.10	0.03	[0.04, 0.15]	0.02	3.59	< .001

Note. $F(14,55286) = 392.29$, $p < .001$, $R^2 = 0.09$.

RQ3: Social-Emotional Support as Mediation

Structural equation modeling was not needed to assess RQ3, “What household structure, if any, promotes positive mental health by providing adequate social-emotional support causing a reduction in the frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status?” based on the use of traditional methods to assess mediation as defined by Baron and Kenny (1986). Traditional methods included the analysis of RQ1 and RQ2, where the relationship between the independent and

dependent variables was analyzed and the relationship between the independent and mediating variables was analyzed. Although the conditions for RQ2 were met, the conditions for RQ1 were not met, meaning that there was no evidence and support for mediation. Household structure could not be analyzed for promoting positive mental health by providing adequate social-emotional support because household structure did not significantly influence mental health as measured using the predictor, frequency of mental distress. The null hypothesis for RQ3 was accepted.

Summary

In Chapter 4, I provided the descriptive statistics and results for Pearson's correlation coefficient and linear regression in reference to answering the three research questions. The null hypothesis for RQ1 failed to be rejected, and a significant relationship was not found between the independent variable, household structure, and the dependent variable, frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status. The null hypothesis for RQ2 was rejected and the alternate hypothesis was accepted based on the findings from linear regression analysis showing a significant relationship between the independent variable, household structure, and the mediating variable, adequate social-emotional support, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status.

Analysis of RQ3 was not supported due to a lack of evidence for mediation found in analysis of RQ1. The null hypothesis for RQ3 failed to be rejected, indicating, "There

is no household structure that promotes positive mental health by providing adequate social-emotional support causing a reduction in the frequency of mental distress, with consideration of the confounding variables health care access, race, income, marital status, number of children in the household, and pregnancy status." In Chapter 5, I discuss the interpretation of the results in relation to the literature reviewed and theoretical framework. Limitations of the study are discussed, and recommendations for future researchers and practitioners are provided, with consideration of potential implications for social change.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

I conducted this study to provide additional information about the role of nonprofessional support in the mental health of reproductive-age women. The specific purpose of this quantitative correlational study was to examine the relationship between household structure and frequency of mental distress, with consideration of the mediation social-emotional support provides. I used the SEM (Sallis et al., 2008; Stokols, 1992, 1996; Stokols et al., 2003; Tallman, 2016) for the theoretical framework of this study, with frequency of mental distress representing the individual level of the human–environment interaction. Household structure and adequate social-emotional support represented the relationship level of the human–environment interaction. The 2010 BRFSS was the secondary data set used, with a total sample size of 65,269 reproductive-age women. Three research questions were analyzed using Pearson's correlation coefficient and linear regression.

The literature review provided support for more extensive analysis using linear regression due to the need to consider the confounding variables of health care access, race, income, marital status, number of children in the household, and pregnancy status. A significant relationship was not found between the independent variable, household structure, and the dependent variable, frequency of mental distress. A significant relationship was found between household structure and the mediator variable, adequate social-emotional support. Owing to a lack of significance between the independent and dependent variables, mediation was not supported, although social-emotional support

influenced both the independent and dependent variables. If mediation was found, prevention strategies by public health practitioners could have potentially been modified at the community level through innovative, nonprofessional support programs that addressed the lack of social-emotional support found in certain households.

Interpretation of the Findings

The findings of this study confirm many of the common themes found in the literature review. Analysis of RQ1 revealed the most significant factors associated with an increase in mental distress was health care access that had been hindered due to cost and low income. These themes aligned with findings from Bloch et al. (2010), Huot et al. (2013), and Molina and Alcantara (2013). In contrast to my findings, Robbins et al. (2014) identified Black reproductive-age women as having the highest frequency of mental distress and White reproductive-age women as having the least. Similar to my findings, White reproductive-age women had the highest frequency of mental distress in Schwarz et al.'s (2012) research; mental distress was correlated with not being married. Additional support for a higher frequency of mental distress in unmarried women was confirmed in the literature by Bayrampour et al. (2015), Bloch et al., and Witt et al. (2012), although Bayrampour et al. also found that partner tension increased mental distress.

In consideration of pregnancy status, reproductive-age women who were not pregnant had a greater frequency of mental distress. In their studies, Bayrampour et al. (2015) and Hall et al. (2013, 2014, 2015a) associated mental distress with an increase in unintended pregnancy rates. Hall et al. (2013) correlated their findings with inconsistent

use of contraceptives. RQ1 and RQ2 directly aligned with the findings for health care access and income level, where the least amount of social-emotional support was associated with cost hindering access to health care and low income. Atkins and Bradford (2014) confirmed that access to health care improved social-emotional support by reducing unintended pregnancies through the provision of contraceptives. The Guttmacher Institute (2016) found that 68% of unintended pregnancies were paid for by public insurance, where low income is required to qualify for these public benefits. Brownell et al. (2011) found that low-income, reproductive-age women were less likely to participate in community programs that provide a source of social-emotional support.

Marital and pregnancy status also were directly aligned between both research questions; not being married or pregnant decreased social-emotional support. Allen et al. (2014) found an increase in housing stability when reproductive-age women lived with a spouse or partner. Living with a spouse can provide negative social-emotional support for certain health factors, such as smoking cessation; Page et al. (2012) found women were less likely to stop smoking if their spouse smoked, for instance. Similar to women with low-income status, unmarried reproductive-age women were less likely to participate in community programs compared to their married counterparts, in research by Brownell et al. (2011). In consideration of pregnancy status, Morgan et al. (2012) found that women have an increase in social-emotional support while pregnant due to the required prenatal visits.

White reproductive-age women had the greatest amount of social-emotional support in my study findings, which was consistent with Robbins et al. (2014). By

contrast, Robbins et al. identified Black reproductive-age women as having the least social-emotional support, whereas my research showed Hispanic reproductive-age women to have the least social-emotional support. In comparison, Robbins et al. identified Hispanic reproductive-age women as having the lowest rating for overall life satisfaction. Witt et al. (2012) found that being married rendered race insignificant when analyzing data in relation to mental health and pregnancy outcomes. In my analysis of children in the household, I found a two tenth decrease per category in social-emotional support as the number of children increased, and with more adults in the household, there was greater social-emotional support.

In reference to the SEM, I analyzed individual- and relationship-level human–environment interactions to potentially identify risk factors that could be associated with community-level programs (see Sallis et al., 2008). Although significance was not found between the relationship-level variable, household structure, and the individual-level variable, frequency of mental distress, knowledge was gained about the potential for mediation at the community level through programs that improve social-emotional support. At the community level, public health researchers and practitioners could benefit from this study by having information about household structure where none previously existed.

Tallman's (2016) examination of the SEM using the Index of Vulnerability identified three domains, which were social support, social status, and access to health care, that related to mental health. I more thoroughly analyzed these domains in this study, where frequency of mental distress represented mental health, one of the main

factors for consideration in SEM. The domain social support was measured using the variables household structure and adequate social-emotional support. Income, race, and marital status related to the domain social status. The domain access to health care was analyzed using the variables health care access and pregnancy status. Income and marital status proved to be representative of multiple domains. Income affected both social status and access to health care, while marital status impacted both social status and social support.

Limitations of the Study

One limitation of the study was the potential misrepresentation of certain sociodemographic groups, although the BRFSS was designed using field-tested questions and data analysis software for internal validity (CDC, 2011b; 2011c; 2011d; Vitalnet, 2012). Owing to my examination of household structure, younger reproductive-age women appeared to be misrepresented. This inconsistency was likely due to many young women not yet being homeowners or having housing stability (see Allen et al., 2014; Goodman, Pendall, & Zhu, 2015). Race seemed also to be skewed toward primarily White women as the majority, which may have caused inconsistencies with the analysis of frequency of mental distress. In addition, the percentage of pregnant women was low. Another limitation with the BRFSS in relation to frequency of mental distress was the study participants self-reporting. Self-reporting lacks the reliability of a validated screening instrument or clinical diagnosis (Farr & Bish, 2013).

In addition to the limitation of self-reporting, underreporting was another challenge associated with using a national survey like the BRFSS, where recall bias was a

limitation of the sample and limits the empirical validity (Frankfort-Nachmias & Nachmias, 2008c). Measures of adequate social-emotional support may also have been affected by bias based on what the study participants perceived having adequate social-emotional support meant. The inclusion of confounders based on the literature review helped to mitigate limitations associated with bias, although confounders may still exist that were not included. Additional confounders that could limit the study could be reproductive health problems, transportation issues, and childcare availability.

For Pearson's correlational analysis of variables for RQ1 and RQ2, all assumptions were met, and any unmet assumptions for linear regression were mitigated by the large sample size, a major benefit of using the BRFSS. Although secondary data sets are useful for large-scale analysis and highlighting correlations, Friedman and Kern (2014) argued the need to evaluate health disparities on a case-by-case basis. Limitations of the SEM theoretical framework became evident when conducting the literature review, where the multiple human–environment interaction levels become difficult to manage for practitioner application due to the multitiered levels. The intent of this study was to analyze variables associated with the "middle-range" strategy of the SEM in an effort to improve practicality by using a national data set (Stokols, 1996).

Recommendations for Future Research

The concept of mediation provided a unique perspective in variable analysis and could be used for statistically analyzing other public health services and programs aiming to close the gap on health disparities. Future recommendations using a secondary data tool could be the use of the PRAMS. This national survey would shift the focus on

reproductive health to a pregnant and postpartum participant perspective (Robbins et al., 2014), emphasizing analysis of variables found in this study that appear to have the greatest impact on preconception health. Specifically, income and health care access proved to be key for decreasing poor health outcomes and could be included for additional analysis of reproductive-health challenges, such as postpartum depression and breast-feeding difficulties. Household structure and pregnancy outcomes could be analyzed with social-emotional support as mediation. Focused analysis on social-emotional support in young reproductive-age women and rural communities would be another recommendation for future studies.

Implications for Social Change

Positive social change implications include an understanding of the relationship between complex variables associated with social-emotional support. Culturally relevant, minority, and underserved populations based on national findings and regional profiles should be the primary emphasis for public health researchers and practitioners (Asada et al., 2014; Bethea et al., 2012; Bloom et al., 2012; Fendall et al., 2012; Kim et al., 2013; Richards & Mousseau, 2012; Short et al., 2012; Smith et al., 2014). This study examined individual-level and relationship-level human-environment interactions to determine if a relationship existed between household structure and frequency of mental distress. Although a relationship did not exist, the implications of this study showed the influence of social-emotional support on many complex variables associated with population health. Social-emotional support was significantly associated with all factors analyzed, indicating its relevance in understanding public health challenges and health disparities.

Specifically, the impact of cost impeding health care access and low income proved to be the most significant variables associated with health disparities. In addition, unmarried and nonpregnant reproductive-age women are at a higher risk for mental distress and reduced social-emotional support. Application of the SEM in understanding multitiered factors that may impede social change is imperative for applying community-level programs to individual- and relationship-level issues. In addressing community health challenges, researchers and practitioners must look toward innovative strategies that encourage participation in public health programs (Chuang et al., 2012; Harelick et al., 2011). Integrative approaches that include health care and public health professionals can make the most positive social impact (Anderson et al., 2015; Bronstein et al., 2012).

I found the results of this study beneficial in demonstrating how relationships that provide social-emotional support could be used to assess which population groups have the greatest risk for health disparities. Publication of my results in a peer-reviewed, scholarly journal would make this information widely available for other researchers and practitioners. This greater understanding between the complex variables associated with social-emotional support could increase awareness of ways to improve community support programs focused on mental health wellness of reproductive-age women. Current intervention programs using an integrative, evidence-based approach are most relevant in promoting positive social change. Both income and racial disparities were significant variables found in my analysis that community programs, such as Centering Pregnancy, are working to address.

For example, a retrospective study conducted by Picklesimer, Billings, Hale, Blackhurst, and Covington-Kolb (2012) found that participation in Centering Pregnancy significantly reduced preterm birth rates in low-income women compared to traditional prenatal care. Picklesimer et al. also found the racial disparities for black women compared to Hispanic and White women was eliminated with participation in group prenatal care. Centering Pregnancy has continued to expand health care and nonprofessional reach by extending into the Centering Parenting and Centering Healthcare programs over the past 10 years (Centering Healthcare Institute, 2019). The Hispanic paradox is another area of research where this study, which examined household structure, social-emotional support, and mental distress, could provide additional information to support innovative community programs.

The Hispanic paradox is considered an 'epidemiological paradox' due to the positive health outcomes found in Hispanic groups in contrast to the sociodemographic disparities this group faces in the United States (Katiria Perez & Cruess, 2014). The cultural value that Hispanics place on familism may have strong implications toward the cause of this paradox, where positive physical and mental health outcomes are higher compared to other racial groups (Katiria Perez & Cruess, 2014). The Hispanic paradox was not demonstrated by Dyer, Hunter, and Murphy's (2011) research in Utah using the PRAMS, although social network size and social support from a husband was positively associated with healthy birth weight in both Hispanic and White racial groups. These findings are consistent with the findings of my research in relation to marital status and provide additional support of the value of publishing my study for researchers and

practitioners. Continuous investigation and building of knowledge relating to health issues, such as mental distress, are necessary for these programs to thrive in their intervention efforts.

Conclusion

Social-emotional support was not a mediator for household structure and frequency of mental distress. The findings of this study show an increase in frequency of mental distress for reproductive-age women was not significantly associated with household structure. The greatest health disparities for mental distress were observed in low-income, White, unmarried, nonpregnant reproductive-age women with health care access hindered due to cost. Social-emotional support for reproductive-age women was lower for households with fewer men and women. The lowest social-emotional support was observed in low-income, Hispanic, unmarried, nonpregnant, reproductive-age women with health care access hindered due to cost. Using the knowledge gained from public health researchers to continually analyze and assess the data is imperative in building programs that integrate health care and nonprofessional support in the most effective manner. Understanding challenging problems, such as mental distress, requires dedicated researchers and professionals continuing to assess the problems in unique ways. From this service, valuable information can be integrated into current programs with community members working to close the gap in health disparities between groups within the local population.

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