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Income, Education, Age, and Physical Activity Among Physically Disabled African American Women

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Abstract

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by

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MA, Liberty University

BS, Liberty University

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

This study was designed to identify possible risk factors about physical activity in middle-aged disabled African American women (AAW) aged 45 to 64 years. Disabled middle-aged AAW has a disproportionate prevalence of obesity and chronic illness than nondisabled women. Most disabled middle-aged AAW leads a sedentary lifestyle, and they do not meet the recommended physical activity (PA) guidelines. Little is known about this group, and a social ecological model was used to explain PA patterns. Data were extracted from the 2009 Behavioral Risk Factor Surveillance System (N = 1,599) for women who responded *yes* to indicate that they needed specialized equipment. This cross-sectional quantitative study used univariate and multivariate analysis to assess the relationship between age, education, and income among middle-aged disabled AAW. A general linear model revealed younger disabled AAW (ages 45 to 54) engaged in more physical activity time per week than did their older counterparts (estimate = 76.012, p = .001). Individuals with less education reported more minutes of physical activity than college graduates (estimate = 142.522, p = .001). Respondents with annual incomes from $35,000-$49,999 (estimate = 184.590, p = .000) were more physically active than their more affluent counterparts. Smoking, demographic variables, and emotional well-being did not affect minutes of moderate physical activity. This research may contribute to positive social change by suggesting that programs intended to increase physical activity among disabled AAW be targeted toward those who are older, are more educated, and have higher incomes.

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Dedication

I dedicate this project to my Lord and Savior Jesus Christ, the anointed one of the highest God, of whom I get my value and my worth. I thank you, Lord, that every time I wanted to quit, “You” gave me new strength for the journey. Also, I dedicate this work to my mother, Eula Mae Richardson Harris, for encouraging my natural curiosity for knowledge. Even though her presence is no longer here, the enjoyment she fostered in me for learning continues.

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To my committee member, Dr. Wayne Jacobs, thank you for your time and encouragement throughout this journey. I appreciate your physical activity knowledge and contribution. To my University Research Reviewer (URR), Dr. Joseph Robare, thank you for being so uplifting and your quick reply during this project; it helped to speed things along. You saved me time and money by responding so quickly. Lastly, I send blessings to all of you for enriching my life. Thank you very much. Godspeed!

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Chapter 1: Introduction to the Study

Introduction

For certain subgroups, the incidence of health disparities and physical inactivity has grown in the United States over the past 30 years (Centers for Disease Control and Prevention [CDC], 2011). In the African American female community, the prevalence of physical inactivity has doubled since the late 1970s (Geyen, 2012; Luncheon & Zack, 2011). In the African American disabled women community, the prevalence of physical inactivity is nearly 60% (Brown, Yore, Ham, & Macera, 2005; Pharr & Moonie, 2011; Rimmer et al., 2010). Empirical evidence has shown that people with disabilities have a greater likelihood of physical inactivity than the general population (Brown et al., 2005; Carroll et al., 2014; Pharr & Moonie, 2011; Rimmer et al., 2010). There is a positive correlation between physical inactivity and premature death from coronary heart disease, stroke, type II diabetes complications, breast cancer, and colon cancer (CDC, 2011; Pharr & Moonie, 2011). Researchers Brown et al. (2005), Carroll et al. (2014), and Pilutti et al. (2014) agreed that the disproportionate prevalence of overweight and obesity among disabled African American women is due to physical inactivity. Research has revealed that disabled African Americans are less physically active than other minorities with disabilities and that within this population, disabled middle-aged African American women exercise the very least (Brown et al., 2005; Boslaugh & Andresen, 2006; Carroll et al., 2014; Escobar-Viera, Jones, Schumach, & Hall, 2014; Pilutti et al., 2014). The leading cause of death in middle-aged disabled African American women is chronic disease, which has been shown to be related to lifestyle choices (CDC, 2011; Pharr & Moonie, 2011). Scientific evidence indicates that most chronic illnesses can be delayed if

not prevented (CDC, 2011). In fact, several researchers have confirmed that staying physically active reduces obesity, aids in weight management, reduces and delays the risk of certain chronic diseases, improves mood by relieving depression, increases functional mobility, and elevates overall health quality (Brown et al., 2005; Carroll et al., 2014; CDC, 2011; Ekelund et al., 2015; Escobar-Viera et al., 2014; Geyen, 2012; Luncheon & Zack, 2011; Murrock & Heifer, 2014). Risk factors for inactivity among physically disabled middle-aged African American women have not been studied.

Problem Statement

Although numerous studies confirm that physical activity is beneficial for health, the majority of people with disabilities lead a sedentary lifestyle (Carroll et al., 2014; Cervantes & Porretta, 2010; Gaskins, Baskins, & Person, 2012; Janssen et al., 2014; Mendoza-Vasconez et al., 2016; Merdock & Heifner-Graor, 2014; Pilutti, Dlugonski, Klaren, & Motl, 2014; Vasquez et al., 2013;Vasudevan, 2016). More than half of the disabled population do not meet the recommended physical activity guidelines, increasing their risk of multiple chronic ailments (Brown et al., 2005; Brand, Alston, & Harley, 2012; Froehlich-Grobe et al., 2014; Rimmer et al., 2010). The objective of this research was to examine the risk factors that influence habitual physical movement among middle-aged African American women with disabilities.

Nature of Study

This study extracted disabled population data from the 2009 Behavioral Risk Factor Surveillance System (BRFSS). Income, education, and age served as the independent variables, and physical activity was used as the dependent variable. The

covariates were marital status, children, emotional support, life satisfaction, and smoking. The theoretical framework was the social ecological model (SEM).

Research Questions

This study explored the relationship between physical activity and several risk factors in disabled middle-aged African American women. The research questions were as follows:

RQ1-Quantitative: Can income predict leisure time physical activity in disabled middle-aged African American women when controlling for education, age, marital status, children, smoking, emotional support, and life satisfaction?

Ho: There is no significant association between income and leisure time physical activity prediction in disabled middle-aged African American women when controlling for education, age, marital status, children, smoking, emotional support, and life satisfaction.

Ha: There is a significant association between income and leisure time physical activity prediction in disabled middle-aged African American women when controlling for education, age, marital status, children, smoking, emotional support, and life satisfaction?

RQ2-Quantitative: Can education predict leisure time physical activity in disabled middle-aged African American women when controlling for income, age, marital status, children, smoking, emotional support, and life satisfaction?

Ho: There is no significant association between education and leisure time physical activity prediction in disabled middle-aged African

American women when controlling for income, age, marital status, children, smoking, emotional support, and life satisfaction.

Ha: There is a significant association between education and leisure time physical activity prediction in disabled middle-aged African American women when controlling for income, age, marital status, children, smoking, emotional support, and life satisfaction.

RQ3-Quantitative: Can age predict leisure time physical activity in disabled middle-aged African-American women when controlling for income, education, marital status, children, smoking, emotional support, and life satisfaction?

Ho: There is no significant association between age and physical activity in disabled middle-aged African American women when controlling for income, education, marital status, children, smoking, emotional support, and life satisfaction.

Ha: There is a significant association between age and leisure time physical activity prediction in disabled middle-aged African American women when controlling for income, education, marital status, children, smoking, emotional support, and life satisfaction.

Purpose

This study aimed to understand national trends for disparities in physical activity among disabled 45- to 64-year-old African American women. A quantitative study design was used to expose the gap in the literature. A secondary data analysis applying the social ecological model (SEM) was used to determine the possible risk factors of physical

activity among the disabled middle-aged African American female population. The independent variables were age, income, and education. The dependent variable was physical activity. By assessing how the independent variables affected the outcome variable, I sought to provide greater knowledge on how the explanatory variables influence regular physical activity among physically disabled African American women (Huberty et al., 2008). The covariates are marital status, children, smoking, life satisfaction, and emotional support.

Framework

The theoretical framework used for this research was the socioecological model by McLeroy, Bibeau, Steckler, and Glanz (1988). The ecological model looks at how individuals relate to the components that surround their environment and affect their behaviors such as interpersonal relationships, institutional factors, and public policy (Kendall, 2006). Research supports the notion that interpersonal relationships and the built environment impact physical activity patterns among the disabled population (Cotter & Lachman, 2010; Rimmer et al., 2010; Vasudevan, 2016). The ecological model was a useful tool for exploring risk factors that influence physical activity frequency among people with disabilities because the theory may be used to assess the many relationships that impact the population's habitual practices. The ecological model provides a framework that showcases common trends in a population. For that reason, the ecological model has the possibility of revealing what influences physical activity in disabled middle-aged African American women because not much is known about the population's physical movement behaviors.

Definitions

Disability: The use of a device or specialized equipment such as a cane, hearing aid, prosthesis, scooter, special computer equipment, special phone, or wheelchair.

Disabled: An individual who has a physical or mental condition that limits movements, senses, or activities.

Mobility limitation: A limiting condition on an individual's ability to execute a movement or activity because of physical restrictions.

Middle-aged: A person who is 45 to 64 years of age.

Physical activity: The Centers for Disease Control and Prevention says physical activity is any bodily movement produced by the contraction of the skeletal muscle that increases energy expenditure above a basal level (CDC, 2011). In these Guidelines, physical activity refers to the subset of physical activity that enhances health. The World Health Organization says physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure (WHO, 2016). For the sake of this study, a combination of these definitions was used, such that *physical activity* refers to any physical movement of the skeletal muscles that causes an oxygen deficit demanding more energy to complete the task than the body would use at rest.

Study's Assumptions

For this study, I assumed that income, age, and education can predict leisure time physical activity frequency among middle-aged African American women 45 to 64 years old when controlling for smoking, emotional support and life satisfaction, children, and marital status. The 2009 Behavioral Risk Factor Surveillance System (BRFSS) was used to provide a national sample to examine and detect if there was a significant difference in

physical activity frequency in people with disabilities. The BRFSS is a national survey used in the United States, the District of Columbia, and three U.S. territories. It is administered annually to noninstitutionalized adults in the United States by highly trained personnel. It is further assumed that because the BRFSS is the first and oldest health-related telephone survey in the United States, with more than 400,000 adult interviews annually since 1984, the instrument is valid.

Limitations

The restrictions of the study are as follows. I only used a portion of the national cross-sectional health survey, the 2009 BRFSS, for this examination. Although the data set generated a sufficient sample to carry out the statistical analysis, the results may not be generalizable to other groups because the community was a distinct subgroup: disabled middle-age African American females 45 to 64 years of age. There may have been an error in research calculations because people who engaged in a lot of vigorous physical activity were not removed. Additionally, there may have been under- or overestimation of physical activity for disabled people because my investigation did not encompass the entire sample of people with disabilities in the data set.

Delimitations

This study used a preexisting data set to assess data from adults 18 years and older who self-reported having a physical disability for which they used a special device. The sample population consisted of the respondents who used a special device or had a physical handicap. The examiner did not include individuals with developmental disabilities. This study may not be generalizable because it consists of a distinct subgroup: disabled middle-aged African American women 45 to 64 years of age.

Significance

I presume that this investigation will contribute to the body of knowledge on physical activity behaviors in middle-aged African American females 45 to 64 with disabilities. Previous research has confirmed that the disabled community fails to meet the recommended physical activity (PA) guidelines (Boslaugh & Andresen, 2006; Brown at al., 2005; Song et al., 2013). The disabled population's leisure time PA participation varied across various studies. Boslaugh and Andresen (2006) stated that 25% of the disabled population met the national PA suggestion, and Brown et al. (2005) wrote that 28.8% of people with disabilities met the PA recommendation. However, Song et al. (2013) stated that on 2% of disabled African Americans met the physical activity guidelines. Researchers do not entirely know why there is such disparity in the PA patterns of people with disabilities. In this examination, I looked at the risk factors that impact physical activity frequency in the community to identify what influences regular involvement. Assessing the role that individual elements have in physical activity in the disabled population could help professional practice in public health in formulating concentrated interventions to enhance the community's health.

Through this study, I sought to support positive social change by exploring physical inactivity in the middle-aged African American female population, in order to devise strategies to increase physical movement. For people with disabilities, participation in physical activity can improve overall health quality and strengthen their physical bodies (Brewer, Olsen, Roddey, & Tapley, 2014; Froehlich-Grobe et al., 2014; Murrock & Heifer, 2014; Pilutti et al., 2014). Stronger bodies and improved health in the

disabled community would mean reduced health care costs related to treating chronic conditions, as well as increased longevity (Pharr & Moonie, 2011).

Summary

This chapter has outlined the problem of physical inactivity in the disabled community and the significance of physical activity interventions to delay chronic disease and improve the population's health status. Physical inactivity disparity is high for people with disabilities. The disabled population has a greater likelihood of being sedentary (Boslaugh & Andresen, 2006; Brown et al., 2005; Song et al., 2013). The 2009 BRFSS was used to draw the data on middle-aged African American women. This research assessed the risk factors that impact physical movement in the disabled middle-aged (45-64 years) African American female population to ascertain participation behavior. In Chapter 2, I present a description of the available literature on physical activity in middle-aged African American women with disabilities.

Chapter 2: Literature Review

Introduction

In the United States, African American women are disproportionately affected by chronic disease (Karvonen-Gutierrez, 2015; Tak, Kuiper, Chorus, & Hopman, 2013; Thorpe et al., 2016). Chronic illness is a medical condition lasting more than 3 months that is treatable with medication but has no vaccine or cure (National Health Council, 2014). Chronic diseases are the leading cause of death and disability nationally and internationally (CDC, 2015; WHO, 2016).

Obesity is a chronic disease that has reached pandemic proportions (CDC, 2011). In the United States, there is a disparity in obesity prevalence in the disabled African American female community (Brown et al., 2005; Carrol et al., 2014; Pharr & Moonie, 2011; Rimmer et al., 2010). There is a substantial amount of research that confirms that disabled African American women are more likely to suffer from obesity than their Caucasian counterparts (Pharr & Moonie, 2011; Song et al., 2013). African American women are more likely to be overweight or obese than other subgroups because of physical inactivity (Geyen, 2012; Luncheon & Zack, 2011).

Physical inactivity is costly, leading to other ailments such as heart disease, diabetes, hypertension, stroke, high cholesterol, and certain types of cancer (Fedewa, Sauer, Siegel, & Jemal, 2015; Hudson et al., 2016; Lutfiyya, Marites, McCullough, Barlow, & Lipsky, 2008; Odom, Fang, Zack, Moore, & Loustald, 2016; Sebastiao, Ibe-Lamberts, Bobitt, Schwingel, & Chadzko-Zajko, 2014). People who are the least physically active suffer from several chronic diseases (CDC, 2011, Geyen, 2012; Pharr & Moonie, 2011; Thorpe et al., 2016; WHO, 2016). Globally, research confirms that a

sedentary lifestyle is a risk factor for the seven leading causes of death (CDC, 2011; Geyen, 2012; Pharr & Moonie, 2011; Thorpe et al., 2016; WHO, 2016). Annually, the health care cost to treat several chronic illnesses is more than a trillion dollars (CDC, 2016). CDC (2016) estimated that Americans spent more than $315 billion dollars in 2010 for stroke and cardiovascular illnesses alone.

Chronic disease is the leading cause of disabilities (CDC, 2015, WHO, 2016). CDC (2015) argued that disabilities affect all Americans financially and socially, with an annual cost of $400 billion dollars. Overall, 1 in 5 people has a handicap (CDC, 2015). *Merriam Webster's Dictionary* defines *disability* as a condition of being disabled ("Disability," 2016). According to the American Disabilities Act, a disability is a physical or mental impairment that restricts a person's activity (CDC, 2016). In other words, a person with a disability has limited physical functioning.

As explained by CDC (2016b), 53 million American adults have a disability. The highest prevalence of disability occurs in African Americans and Alaskan Natives/Native Americans, at 24.3% each (U.S. Census Bureau, 2012). Women are more likely to report limited physical function because of a disability (Banks & Kaschak, 2014; CDC, 2015; Escobar-Viera, Jones, Schumacher, & Hall, 2014; U. S. Bureau of Labor Statistics, 2016). African Americans account for 3 in 10 people with disabilities (CDC, 2015); women account for 1 in 4 people with disabilities (CDC, 2015).

Research has shown that physical inactivity in people with disabilities is directly related to being overweight (Boslaugh & Andresen, 2006; Brown et al., 2005). Individuals with disabilities are more likely to lead a sedentary lifestyle, which causes other serious health problems (Pharr & Moonie, 2011; Song et al., 2013). Obesity affects

38.4% of the physically disabled population (CDC, 2015). Whereas, disabled individuals with hypertension comprised more of the population with 41.7% (CDC, 2015). CDC (2015) stated that among the disabled population, the physical inactivity rate is 36.3%. Well over one-third of people with disabilities do not engage in adequate physical movement, increasing their risk of sickness (CDC, 2015; Holahan, Holahan, Li, & Chen, 2016). These individuals are 3 times more likely to battle diabetes, cancer, stroke, or heart disease (CDC, 2015).

As explained by CDC (2016), in the United States, African Americans has the highest age-adjusted rates of obesity. America's middle-aged population (ages 45-64 years) represents the adult group with the largest obesity rate in the country (CDC, 2016). Within this group, middle-aged African American women are more likely to be overweight than minorities (CDC, 2011; Geyen, 2012; Luncheon & Zack, 2011). For that reason, disabled middle-aged African American women are at a significant risk of being overweight or obese because of physical inactivity (Brown et al., 2005; Carroll et al., 2014; CDC, 2015; Holahan et al., 2016; Pharr & Moonie, 2011; Rimmer et al., 2010).

Factors that contribute to obesity include excess food consumption and no to little physical energy expenditure (Buchowski et al., 2010; Ekelund et al., 2015; Tussling-Humphreys et al., 2013). CDC (2016) and WHO (2016) have indicated that there is a relationship between obesity and inadequate physical movement. Researchers Ekelund et al. (2015) argued that physical inactivity accounts for more morbidity and mortality globally than any other disease condition.

Research has confirmed that the most efficient method of reducing chronic illness and health disparities in the obese middle-aged disabled African American female

community is increasing physical activity (Boslaugh & Andresen, 2006; Brown et al., 2005; Buchowski et al., 2010; CDC, 2011, 2015; Ekelund et al., 2015; Pharr & Moonie, 2011; Tussing-Humphreys et al., 2013). Increased physical movement reduces excess body fat, which is a known risk factor for cardiovascular disease, certain types of cancer, type II diabetes, hypertension, high cholesterol, fatty liver disease, and obesity (Buchowski et al., 2010; CDC, 2011, 2015; Ekelund et al., 2015; Pharr & Moonie, 2011; Tussing-Humphreys et al., 2013). Lack of physical movement increases the population's risk of premature death (Ekelund et al., 2015). Escobar-Viera, Jones, Schumacher, and Hall (2014) stated that individuals with disabilities should maintain physical activity to help reduce body lipids and chronic pain associated with chronic disease, as well as to increase physical function and mobility. Rabelo et al. (2015) demonstrated that physical activity improves muscle strength and trunk mobility in people with limited physical function.

The remainder of this chapter provides an extensive inquiry into the existing literature focused on disability, middle-aged African American women, and physical inactivity. The chapter includes the search strategies used to review the literature and the theoretical framework used in this examination. I then present the keywords and terminology that may be used for duplication of this literature search. The prime targets of the literature review were investigations that used the sample variables of interest. The independent variables were income, age, and education. The dependent variable was physical activity.

Next, I present a literature review matrix with a summary of significant studies evaluated for this examination. To close out the chapter, I discuss comparable

investigations to explain the rationale for the research method and design used, as well as to pinpoint the gaps in the literature. The layout above allows for a smooth flow of the chapter as I present the methodology applied in this examination.

Literature Search Strategy

An online search was conducted to identify current literature on physical activity among disabled middle-age African American women using the variables of interest. The primary databases used were PubMed, ProQuest, Google Scholar, CDC, Medline, and WHO. All documents were accessed electronically via the Walden University Library website. I excluded duplicate studies and investigations not in English. I narrowed the search by selecting filters that allowed only relevant articles by keywords and specified publication date. The databases delivered journal articles that were peer reviewed and/or official records from governmental agencies published from 2010 to 2016. The search terms were as follows: *physical activity*, *physical function*, *limited mobility*, *African American women*, *disabled*, *disabilities*, *physical fitness*, *exercise*, *African American females*, *middle-aged women*, *middle-aged females*, *chronic disease*, and *ecological theory*.

Inclusion Criteria

Literature used for this examination had to meet the following requirements:

1. Publication date from 2010 to 2016 (except for several relevant significant documents).
2. Peer-reviewed journal article and/or publication of governmental agency.
3. Journal article that reviewed disabled African American women.

Exclusion Criteria

Sources were not used if they (a) did not reinforce this study, (b) did not meet the inclusion criteria, or (c) did not relate to the specified population.

Theoretical Framework

The theoretical approach that directed this study was McLeroy, Bibeau, Steckler, and Glanz's (1988) social ecological model (SEM), also referred to as the *ecological model*. Researchers apply this model widely in studies dealing with behavioral change because it allows one to evaluate the complexities associated with behavior adaption. The ecological model suggests that several key factors play into an individual's lifestyle choices. The environment, the individual, the individual's interpersonal relationships, and the individual's community are multilevel dynamics that affect health change (McLeroy et al., 1988). The ecological model looks to empower the individual, educating the public and mobilizing community stakeholders to assist the individual to engage in better health practices (Schneider, 2014). The rationale for selecting this theory was to demonstrate that it is necessary to review the multilevel components that play into a person's decision making about engaging in physical activity as a lifestyle.

Similar Studies' Use of the Ecological Model

Mama, Diamond, et al. (2015) applied the ecological model in a quantitative design to explain multilevel factors related to physical activity adaption among obese and overweight African American and Hispanic women aged 25 to 60 years. African American women comprised 65.9% of the study's sample. The authors' objective was to assess how the built environment, individuals, and their social interaction affect their physical activity level when applying a social structural model. The participants used an

accelerometer for 7 days to assess physical activity. The research revealed that body image and composition in the population were negatively associated with physical activity.

In another study, Mama, McCurdy, et al. (2015) employed the ecological model in a qualitative investigation to better understand the habitual mechanics that middle-aged African American and Hispanic women undergo when trying to adapt physical activity as a new health behavior. The authors assessed personal factors as well as elements of the built environment such as public safety to identify which components influence health behaviors. The study revealed that 41.2% of the population had an income greater than $82,600 a year. The examination demonstrated that a more sophisticated approach was needed when developing an intervention for that population.

Researchers Schoeny, Fogg, Buchholz, Miller, and Wilbur (2017) used the ecological model in their study to assess personal barriers to physical activity for 284 middle-aged African American women aged 40 to 65 residing in the Chicago area. The authors evaluated the individuals' community, physical and psychological health, demographics, and social support for physical activity treatment. Schoeny et al. (2017) randomized the area by clusters to place the participants into one of three treatment groups. The groups received either no treatment or automated and personal phone calls to encourage and strengthen continuance of therapy. Data were collected at baseline and at the 24- and 48-week marks (Schoeny et al.).

Literature Review Related to Key Concepts and Variables

The fundamental concept in this study was physical activity among middle-aged African American women and its association with obesity in the disabled population. The

variables of interest were income, age, education, disability, sex, and race. This section expands on literature addressing the same variables.

Studies Related to Fundamental Concept: Physical Activity

Globally, physical inactivity is the fourth leading cause of death (Boslaugh & Andresen, 2006; WHO, 2016). Physical inactivity has risen over the past three decades, and sedentary lifestyles have become commonplace in modern society (CDC, 2011, 2016a; Geyen, 2012; Luncheon & Zack, 2011). As physical inactivity has increased, so have obesity and obesity-related diseases (CDC, 2011; Holahan et al., 2016; Hudson et al., 2016). Research has confirmed that certain racial groups experience disproportionate rates of obesity-related health problems (Geyen, 2012; Hudson et al., 2016; Lutfiyya et al., 2008) and engage in little physical movement, which affects overall health quality (Luncheon & Zack, 2011).

Boslaugh and Andresen (2006) had two objectives: (a) to use a large representative sample of American adults to identify circumstances that foster physical movement status in disabled persons and (b) to determine how many types of disability the participants reported. The population was 4,032 individuals with disability drawn from the 2001 Behavioral Risk Factor Surveillance System (BRFSS) database. The authors evaluated employment, income, race, ethnicity, age, sex, and education in relation to physical activity. The researchers conducted a *t* test to compare sample means of persons with a disability to people without disabilities on various factors. The examination revealed that less than 25% of the population with a disability was consistently physically active.

Saebu's (2010) aim was to explore the literature on correlates and relationships of physical activity among disabled persons 16 to 65 years of age. The researcher wanted to provide an extensive review of literature that explored physical functioning, environmental elements, personal factors, physical activity quantity, and how it correlates to the relationship of physical activity among disabled adults. The study discovered significant correlates. There were associations of physical functioning and disability, the built environment, accessibility, and cost. In like manner, there was a relationship of self-efficacy, depression, and age. The author concluded that research is needed on physical activity among individuals with disabilities to develop tailor-made interventions for this group.

Researchers Harrison, Umberson, Lin, and Cheng (2010) employed a qualitative study design using a grounded theory approach to explore health-promoting practice over the life course in disabled women from middle age to late life. The authors wanted to gain a better understanding of what the population believed to have happened after becoming disabled. Additionally, Harrison et al. examined the elements that most affected the communities' health behavior practices, such as physical activity, smoking, healthy diet, and weight management.

Table 1 contains a summary of the literature reviewed on physical activity.

Table 1

Summary of the Literature on Physical Activity

Author & year	Title	Study design	Study population	Independent variables	Dependent variables	Results
Boslaugh, S. E., & Andresen, E. M. (2006).	Correlates of physical activity for adults with disability	Cross-sectional study	4,038 self-reported respondents from the 2001 BRFSS	Age, race and ethnicity, sex, education, BMI, employment, income, marital status.	Physical activity	Only one-fourth of the study population met the recommendation for moderate activity level. African American race, age of 50 years or older, an annual income of $50,000 or higher, and being in good, fair, or poor health were all significantly related to activity level; sex, educational attainment, health care access, and years of disability were not. Years of activity limitation was not related to physical activity level.
Brand, D. J., Alston, R. J., & Harvey, D. A. (2012).	Disability and race: A comparative analysis of physical activity patterns and health status	Cross-sectional study	7,315 African Americans and 82,482 Caucasians self-reported having a disability in the 2007 BRFSS.	Age, marital status, employment, income, education, sex	Physical activity	There was a significant difference in health status and PA patterns across racial groups. African Americans with a disability were less likely to be moderately physically active than Caucasians. As health declines, African Americans are less physically active than the Caucasian counterpart.
Brewer, W., Olson, S., Roddey, T., & Tapley, H. (2014).	The effects of a group exercise program on the weight management of obese women in a publicly funded healthcare system	A prospective cohort pilot study	77 women ranging in age from 23 to 73 years. Two-thirds of the women were middle-aged. The mean age was 57.32.		Physical activity	Participants' functional cardiovascular endurance improved ($p < 0.005$), lower and upper body strength ($p < 0.006$ and 0.042, respectively), self-worth ($p < 0.0005$) and moderate physical activity ($p < 0.009$).
Brown, D. R., Yore, M. M., Ham, S. A., & Macera, C. A. (2005).	Physical activity among adults > or = 50 yr with and without disabilities, BRFSS 2001	Cross-sectional study	74,960 individuals stratified by disability.	Age, gender, race/ethnicity, education, income, employment, marital status, children, general	Physical activity	A total of 43.4% people without disabilities were active at the guideline, 39.1% were insufficiently active, and 17.5% were inactive. Whereas 28.8 % persons with disabilities met the PA recommendations, 35.7% were

Author & year	Title	Study design	Study population	Independent variables	Dependent variables	Results
				health status, BMI, smoking		insufficiently active, and 35.7% were inactive. The highest odds of inactivity among both groups applied to obese African American women over age 75 with low income and education. Disabled people can be physically active to some degree, even if they do not meet the PA guidelines.
Carroll, D. D., Courtney-Long, E. A., Steven, A. C., Sloan, M. L., Lullo, C., Visser, S. N., … Dorn, J. M. (2014).	Vital Signs: Disability and physical activity – United States, 2009-2012.	Cross-sectional 2009-2012 National Health Interview Survey (NHIS)	83,469 adults 18 to 64	Sex, age, income. BMI, race/ethnicity, smoking status	Physical activity	Nearly half of the disability population are not physically active. Those persons have a greater likelihood of having a chronic disease. There are 4.7 million inactive adults with disabilities who have a chronic illness. 44% of the disabled population who received a physical activity recommendation from their clinician were more likely to exercise.
Escobar-Viera, C. G., Jones, P. D., Schumacher, J. R., & Hall, A. G. (2014).	Association between living alone and physical inactivity among people with and without a disability, Florida BRFSS, 2009.	Cross-sectional study	2,567 adults who self-reported having a disability.	Age, sex, income, marital status	Physical activity	51% of the population were female, mean age 49, 56% were employed, 60% were married, 18% lived alone, and 64% had an income less than $20,000. Social support had a positive impact on behavior change.
Froehlich-Grobe, K., Lee, J., Aaronson, L., Nary, D. E., Washburn, R. A., & Little, T. D. (2014).	Exercise for everyone: A randomized controlled trial of Project workout on wheels in promoting exercise among wheelchair users.	Randomized controlled trial	173 women 18 to 65 manual wheelchair users. Mean age 45.	Age, race, education, sex, employment, pain, years of disability	Physical activity	There were significant within-group but no between-group differences for change in peak aerobic capacity and maximal strength over 12 months. There were no significant between-group or within-group differences for change in body weight. The staff-supported group reported significantly greater exercise (w17min/wk) than the self-guided group over the year (tZ10.6, PZ.00), with no significant between-group difference in aerobic capacity (tZ.76, PZ.45) and strength (tZ1.5, PZ.14).

Author & year	Title	Study design	Study population	Independent variables	Dependent variables	Results
Pharr J. R., & Moonie, S. (2011).	Chronic disease and risk factors among Nevadans with disabilities: A 2009 BRFSS study.	Cross-sectional	16.5% of the population. People 21 to 64	Age, sex, income, chronic disease, education, race, gender, access to healthcare	Physical activity	Disabled individuals were more likely to be inactive (RR 1.6) and obese ($p < .001$), and were less likely to be asked about alcohol, drug, or tobacco use. People with disabilities were more likely to rate their health as poor compared to people without disabilities ($p < .001$). Disabled people were more likely to report having a chronic disease such as asthma, cardiovascular disease, diabetes, and stroke.
Piltti, L. A., Dlugonski, D., Klaren, S. R., Motl, R. W. (2014).	Randomized controlled trial of a behavioral intervention targeting symptoms and physical activity in multiple sclerosis.	Randomized controlled trial	82 women 18 to 64 from the North American Research Committee on Multiple Sclerosis (NARCOMS)	Age, height, weight, sex, disease years	Physical activity	The study revealed a positive association of physical activity on fatigue ($p = .001$). There was a significant effect on depression and anxiety. However, the pain was not reduced. People with MS have insufficient physical activity.
Rimmer, J. H., Hsieh, K., Graham, B. C., Gerber, B. S., & Gray-Stanley, J. A. (2010).	Barrier removal in increasing physical activity levels in obese African-American women with disabilities.	Prospective study	53 African American adults' females were referred by their primary care physician from a large Midwestern university medical center. Age 25 to 79	General health status, BMI, social support	Physical activity	The was a BMI reduction of 7.4% from the higher support group compared to the 0.2% reduction for the awareness group, and a 1.6% BMI increase for the lower support group. The lower and higher-level support group physical activity score increase of 39% and 30% compared to a 13% decline in the awareness group. For severely obese adults phone-based coaching was a useful tool to reduce body fat and increase physical movement.
Song, J., Hochberg, M. C., Chang, R. W., Hootman, J. M., Manheim, L. M., Lee, J., …	Racial and ethnic differences in physical activity guidelines attainment among people at high risk	Cross-sectional study	Recruited 4,796 adults with osteoarthritis and knee complication aged 45 to 79.	Age, sex, income, education, BMI, comorbidity, knee pain, and site	Physical activity	The physical activity guidelines were met by 2% of African Americans and 13% of Caucasians. The adjusted OR was 0.24, 95% CI was 0.08 – 0.72. African Americans were 72 – 76% less likely to meet PA recommendations compared to Caucasians. The BPAQ-

Author & year	Title	Study design	Study population	Independent variables	Dependent variables	Results
Dunlop, D. D. (2013)	of or having knee osteoarthritis					MI is the first questionnaire that places greater equity at measuring barriers to PA across the interpersonal, intrapersonal, community, and organizational domains.
Vasudevan, V. (2016).	An exploration of how people with mobility disabilities rate community barriers to physical activity.	Cross-sectional study	75 people with mobility disabilities were recruited from a Chicago fitness center, and 75 people with disability were recruited from a Chicago independent living facility. The mean age was 55.2 years.		Physical activity	Fear of crime was reported as the largest community barriers 40.7% and cars moving too fast 40.7%. The highest rated barrier was "lack of accessible transportation to a fitness center with a median rating of 5. The lowest rated barriers with a median rating of 3 included: the crosswalks lacked traffic lights and presence of loose dogs in the community. The mean BMI was 30.4. Also, 50.7% used a cane, 36.7% were in wheelchairs, and 30% used a walker. Also, 61.3% had some college education 24.7% graduated high school, and 14.0% had less than a high school education. 69.3% income was < $15,000 per year, 11.3% had an annual income between $15,000 and $20,000, and 19.4% had an annual of over $30,000.

Definition of Physical Activity

There are two standard definitions of physical activity in the literature. The first, physical activity is any energy expenditure of the body that demands more energy than resting and works muscles (Geyen, 2012; Luncheon & Zack, 2011; Mama, Diamond, et al. 2015; National, Heart, Lung, and Blood Institute, 2016; Saebu, 2010; Schoeny et al., 2017). The second, any physical pursuits that deliver an energy deficit caused by body movement of the skeletal muscles (CDC, 2011; Ekelund et al., 2015; Escobar-Viera, Jones, Schumacher, & Hall, 2014; Regnaux et al., 2015; Tussing-Humphreys et al., 2013; WHO, 2016). For the sake of this study, the author has combined both definitions for physical activity. For instance, physical activity is any physical movement of the skeletal muscles that cause an oxygen deficit demanding more energy than at rest to complete the task.

Measurement Tool for Physical Activity

The most standard measurements of physical activity is a positive response to a self-reported survey questionnaire and accelerometers (CDC, 2011; Cervantes & Porretta, 2010; Ekelund et al., 2015; Geyen, 2012; Luncheon & Zack, 2011).

Protective Effects of Physical Activity

Research has confirmed that physical activity has a protective element for those who chose it as a lifestyle (Lachman & Agrigoroaei, 2010). According to Brand, Alston, and Harley (2012), and Gaskins, Baskins, and Person (2012) empirical evidence support that physical activity has a protector factor to reduce and delay chronic disease disability from stroke, cardiovascular disease, hypertension, type II diabetes, and certain types of

cancers. Authors, Cotter and Lachman (2010) discuss how physical activity lessen the aging process by assisting in mobility function, and weight management. Ekelund et al. (2015), and Janssen et al. (2014) argues that routine physical activity increases longevity, balance, stamina, mental health, improves musculoskeletal, maintains weight, and reduces chronic aliment and joint pain.

Practical Function of Physical Activity

Engaging in physical activity provides a buffer from further decline in functional ability (CDC, 2015; Lachman & Agrigoroaei, 2010; Regnaux et al., 2015). Starting with women between the ages of 40 to 60 functional ability declines at a rate of about 20% and hasten by age 65 to 70 (Lorenz, 2010). For women, the decline is expedited because women have more disability and a higher disease burden than their male counterpart (Lorenz, 2010; Thorpe et al., 2016). High and low intensity physical activity strengthen the physical health of the 70% female population that had hip and knee ailments (Regnaux et al., 2015). The women were able to sit, stand, and get up from the floor easier when engaging in physical activity as opposed to pre-physical movement (Regnaux et al., 2015). As individuals became more physically active, they experienced reduced fatigue and joint pain, and increased functional mobility (Murphy et al., 2010).

Physical activity allows people with restricted mobility to move more freely (Murphy et al., 2010; Lachman & Agrigoroaei, 2010; Lorenz, 2010; Regnaux et al., 2015). In a retrospective analysis of one-year longitudinal step program Halsne, Waddingham, and Hafner (2013) contend that physical activity helped amputee person's maneuver through their built environment with greater agility because of increased

balance and physical strength. During the 12 months of observation, 17 people were watched to see how well they could handle themselves with and without prostheses. The amputee individuals were able to participate in daily life activities as they became stronger because of increased physical movement (Halsne, Waddingham, & Hafner, 2013).

Persons who practice being physically active on a consistent basis were less likely to lose balance and experience a fall (Murphy et al., 2010; Lachman & Agrigoroaei, 2010; Lorenz, 2010; Regnaux et al., 2015). Physical movement improved joint pain and functional status (Regnaux et al., 2015). As explained by Vasquez et al. (2013) physical activity increases bone density as individuals ages which protect bone breakage in the event of a fall. People with disability are more susceptible to falls because of limited mobility and impaired balance (Halsne, Waddingham, & Hafner, 2013; Murphy et al., 2010). Physical activity increases people with disability perceived safety level and overall quality of wellbeing (Regnaux et al., 2015).

Studies Related to Chronic Disease

The prevalence of disability in midlife persons has increased and ranges between 20 and 40 % of the population (Karvonen-Gutierrez, 2015) because of chronic disease. Midlife people are the fattest group who do the least exercise (CDC, 2016). The lack of bodily movement elevates a person's chance of chronic disease increasing their likelihood of disability (Bank, & Kaschak, 2014; Boslaugh & Andresen, 2006; Geyen, 2012; Luncheon & Zack, 2011; Thorpe et al., 2016). According to various research, chronic disease is a major contributor to disability among late mid-life minorities (Bank,

& Kaschak, 2014; Boslaugh & Andresen, 2006; Escobar-Viera et al., 2014; Thorpe et al., 2016).

Thorpe et al. (2016) contend that African Americans especially women are more prone to physical limitation because of chronic disease. Karvonen-Gutierrez (2015) argue that physical activity is a crucial line of defense to combat obesity and to prevent loss of mobility within the population. Research has shown that physical function declines with age across the populations because of the increase of chronic ailment and lack of physical movement (Bank, & Kaschak, 2014; Boslaugh & Andresen, 2006; Escobar-Viera et al., 2014; Thorpe et al., 2016). Midlife is a pivotal time to reduce functional limitation in an at-risk community (Karvonen-Gutierrez, 2015).

According to Centers for Disease Control and Prevention (2015), arthritis is a primary contributor to disability in the United States. Several studies support that a regular physical activity routine decreases joint pain in people with arthritis (Murphy et al., 2010; Lorenz, 2010; Regnaux et al., 2015). As told by Lorenz (2010) physical activity assists people with disability in daily functional mobility by reducing joint stiffness and soreness while increasing flexibility. Physical movement reduces swelling in the joints, causes more fluid to reach the muscles and joints and decrease the further loss of mobility (Lachman & Agrigoroaei, 2010).

Literature Related to Design

Cross-Sectional

Carroll et al. (2014) conducted a cross-sectional study using the 2009-2012 National Health Interview Survey (NHIS), which is a civilian noninstitutionalized phone

interview to ask the United States about their health conditions and practices. The sample was 83, 469 disabled adults from 18 to 64 years. The authors had two objectives. The first, they wanted to know the prevalence of aerobic conditioning and chronic disease in the emerging adults and the middle-aged disability community. In the United States, 11.6% of the population reported having some type of disability. The second was to assess how well clinicians could convince the community to start a physical activity intervention to enhance health quality and to complete the program.

Even though 50% of the population was inactivity and at an elevated risk of developing a chronic health condition, only 44% of the respondents were recommended to join an intervention. The Carroll et al. (2014) investigation revealed that 1 in 8 disabled individuals 18 to 64 has a limitation in mobility. Inactive people are 50% more likely to have a chronic illness than the physically active person. In the United States, there are more than 10 million disabled people who do not engage in physical activity. Nearly half of those individuals who have a chronic disease are missing the opportunity to lessen the impact of the ailment.

Boslaugh and Andresen (2006) employed a cross-sectional approach to examine the effects of physical activity in disabled middle-aged women. The authors examined seven explanatory variables age, sex, race and ethnicity, income, employment, education, and marital status. The researchers aim to explore the factors that impact the United States disabled adult population on a large representative sample. The authors' sample of 4038 middle-aged disabled African American came from the 2001 Behavioral Risk Factor Surveillance System (BRFSS) database. Boslaugh and Andresen (2006) used two

questions from the BRFSS to determine if a person has a disability: are you limited in any way or activity because of a health problem? And do have any health issue that requires you to use special equipment such as a cane, walker, or wheelchair, special bed or telephone?

According to Boslaugh and Andresen (2006), there are anywhere from 200,000 to 300,000 premature deaths annually in the United States due to physical inactive, yet less than a third of the general population is physically active. For people with disability, only a quarter of the community met the recommended guidelines for physical movement. Most of the disabled population reported very little to no physical movement. In fact, 56% of people with disability are not physically active increasing their risk of premature death. The authors computed the health status, demographic, health care access, and health behavior variables to assess the unadjusted and adjusted odds ratios for disability population.

Escobar-Viera, Jones, Schumacher, and Hall (2014) administered a cross-sectional approach using the 2009 Behavioral Risk Factor Surveillance System for Florida to access data for the 2,567 sample. The study respondents were 51% female with a mean age of 45 and 40% minorities. Whereas 60% of the participants were married, 56% were employed, 64% income was less than $50,000, and 18% lived alone. The study objective was to explore if a lack of social support unequally impacts people with disability in physical activity. The authors' hypothesized living alone would have a significant adverse effect on disabled people being physically active.

The study's explanatory variables were age, education status, sex, income, employment, race, drinking, smoking, and marital status. The researchers conducted a multivariate logistic regression to assess the differences in physical activity results. The classification of disability was stratified by if the disabled person lived alone at the time the survey was administered. The study confirmed that social support of family and friends were positively related to physical activity participation in disabled people. Escobar-Viera et al. (2014) examination revealed that individuals who lived alone and had the least social interaction had the lowest physical activity measurement. The authors suggested that program developers should review household composition when designing interventions to fit the populations' social network needs better because interacting with others influences daily physical movement.

In a cross-sectional study on physical activity among people, 50 and older with and without a disability Brown, Yore, Ham, and Macera (2005) used the 2001 BRFSS to assess how physically active are middle-aged and older disabled individuals. The authors stratified the sample by disability, age, BMI, and health status. The researchers noticed that information on disabled persons was sparse and aimed to investigate how active are distinct subgroups.

Brown et al. (2005) discovered that nearly 44% of the general community met the physical activity recommendation. Whereas 39.1 % were not meeting the PA guidelines, and 17.5% of the population was inactive. However, in the disabled community, 28.8% fulfills the physical activity suggestion. Whereas 35.7% of disabled person's physical movement was inadequate, and 35.7% were not active less than their nondisabled

counterpart. The authors ’examination revealed that obese African American females over 75 had the highest odds of physical inactivity. These women had low education as well as low income.

The examination also revealed that one third of middle-aged adults 45 to 64 met the physical activity guideline recommendations. Unfortunately, middle-aged women did not meet the moderate level of physical movement. Brown et al. (2005) made mention that even though physical disability can limit a person’s functional mobility, everyone can be active to some point for health improvement. Research confirms that functional movement does increase over time with routine physical exercise (Brown, 2005; Carroll et al., 2014).

Song et al. (2013) administered a cross-sectional examination to explore how many people with arthritis met the 2008 U. S. Department of Health and Human Services Physical activity aerobic recommended guidelines. The sample was 1, 142 individuals who were 49 to 84 years old. The authors assessed the physical movement of African Americans to evaluate the difference when compared to their Caucasian counterpart. African Americans’ were nearly seven times less active than Caucasian persons.' In fact, the research revealed that only two percent of African Americans’ met the recommended guidelines. Whereas, 13% of Caucasians’ met the physical activity suggestions.

Even after, Song et al. (2013) adjust for sociodemographic and health factors African American’s; especially, women were at greater risk of arthritis disability than Caucasians because of small physical movement. In like manner, African America’s had a 72-76% less likelihood of meeting exercise guideline recommendations. The odds ratio

was 0.24 with a 95% CI of 0.08-0.72. The researchers used accelerometers to monitor physical activity. Overall, African Americans' were more overweight or obese and had greater mobility limitations.

Pharr and Moonie (2011) investigation was cross-sectional secondary data analysis that used the 2009 BRFSS to ascertain chronic illness risk factor differences in adults with disability verses non-disability persons in Nevada. The researchers used the two key disability questions on the BRFSS survey. Nevada's disabled population were more likely to report physical inactivity and poor health than the general community. The authors weighted the data to attribute non-response.

Pharr and Moonie (2011) study probed the risk factors that contribute to chronic disease and poor health in people with disability. The investigation uncovered that physical inactivity was a key component to increased chronic disease in the disabled community as well as a decreased quality of life when compared to their nondisabled counterpart. People with a disability had a greater likelihood of being physically inactive and overweight or obese. The authors recommend that disabled people should be asked about alcohol, drug, and tobacco use to ascertain what effects they have on the populations' quality of life.

Brand, Alston, and Harley (2012) conducted a cross-sectional study on 7315 middle-aged African American women with disabilities from the 2007 BRFSS to evaluate their physical activity participation. The researchers administered an analysis to identify physical activity trends among people with disabilities. The authors assessed that 73% of the population participate less in exercise since their disability. Furthermore,

only 10% of the disability community engage in aerobic exercise for 15 minutes at least three times a week.

In an investigation on disability and physical activity Brand, Alston, and Harley (2012) study uncovered that certain subgroups are less physically active. The investigators stated that African American are less likely to meet the national physical activity recommendation guideline. The African American disabled population have a greater likelihood of not engaging in regular daily physical movement. In fact, only 8% of disabled African American females were physically active.

Researcher Vasudevan (2016) did a cross-sectional study to explore the disabled community top ranking perceived barriers to physical activity within their neighborhood. The author also wanted to assess the possible association between community barriers and physical activity. Vasudevan (2016) wanted to comprehend better how people with disabilities list the obstacles looking through an ecological lens. How does the intrapersonal, interpersonal, community, and organizational barriers to physical activity rank with the disabled population?

The recruitment took place in Chicago at a fitness center and an independent living center. The authors gathered 75 people from both locations to achieve a sample of 150 disabled people. The author had the respondents' complete three questionnaires within 40 minutes on what they perceived the largest barriers to physical activity. The two most frequent responses were fear of crime and fast traveling cars both with 40.7%. Next, the most common response was a lack of transportation to a fitness center.

Prospective Study

Rimmer, Hsieh, Graham, Gerber, and Gray-Stanley (2010) conducted a prospective pilot study to explore the effectiveness of a telephone-based intervention to expand physical movement among disabled, overweight African American females. The authors wanted to eliminate barriers to physical activity. The intervention was a six-month program, and the respondents received personal coaching sessions twice a week during the entire program. The authors targeted severely obese women with restricted mobility.

The researchers found that cost, transportation, exercise awareness, pain, health concerns, and finding a suitable gym were barriers for the respondents' ability to engage in regular physical activity participation. Even though 53 women started the program, in the first three months 20 participants were lost to follow up. Rimmer et al. (2010) investigation had 33 women complete the intervention. The examination revealed that the disability community with little activity increased knowledge on where and how to engage in physical activity.

Brewer, Olson, Roddey, and Tapley (2014) conducted a prospective cohort pilot investigation to examine how useful a 12-week group exercise, physical self-worth, and education of physical activity would be in African American females with neuromusculoskeletal impairment. The participants were 23 to 73 with a BMI greater than 30. Most of the respondents were middle-aged with a mean age of 57.32. There were 23 women to finish the intervention.

The researchers' investigation revealed that the participants were deficient on the significance of physical activity for overall health quality. Brewer et al. (2014) found that there was a significant increase in the 6-minute walk test (6 MWT) and physical self-worth (PSW) among the women despite the population's lack of weight reduction during the 12-week intervention. The women also gain greater hand grip strength, upper body strength, and could complete squats after the 12-week intervention. Despite no weight loss, the intervention enhanced the functional fitness of the people with disability by the end of the program. For example, aerobic endurance ($p < .005$), Upper and lower body strength ($p < .042$ and .006), PSW ($p < .005$) and moderate PA ($p < .009$). The researchers measured the population at baseline, during, and three months after the completion of the program.

Randomized Controlled Trial

Pilutti, Dlugonski, Klaren, and Motl (2014) conducted a randomized controlled trial of 82 women for six months. There were 41 women in the control and intervention group. The authors had two objectives. One was to explore how effective a physical activity behavior intervention would be for anxiety, depression, fatigue, sleep quality, and pain delivered via the internet. The authors second objective was to reproduce former outcomes on changing the respondents' physical activity.

Pilutti et al. (2014) found that physical activity to be an alternate way to handle multiple sclerosis symptoms. The examination revealed that there was no significant difference between groups in physical activity, HRQOL outcomes pre-trial, and clinical characteristics, demographics, or symptomatic. However, there was a significant

difference on physical impact (p = .008), and fatigue severity (p = .001). Also, 37 people completed the intervention, whereas there were 39 women to complete the control group. The people lost to follow up were much younger than person's who completed the program.

Froehlich-Grobe et al. (2014) exploration stratified respondents by the type of disability such as episodic, progressive or stable. There were 64 disabled women 18 to 65 years of age. The average age of participants was 45 with at least 22 years of impairment. The target audience were inactive manual wheelchair users. The intervention was 52 weeks. The authors used the social cognitive theory and relapse prevention model to assess the effectiveness of 2 home based interventions to foster the adoption of physical activity among manual wheelchair users.

The primary setting was in the subjects' home and the local fitness center. The staff supported group received intensive fitness support whereas the self-guided group received instructions on a monitor, resistance bands, and fitness information. The researchers' examination revealed that the staff supported group had a significant difference of 17 minutes voluntary physical movement than the self-guided group over the 52 weeks. However, there was no significant difference in aerobic and strength capacity between the groups. The staff supported group had far more physical activity frequency than the self-guided individuals which lead the authors to believe that people with disability need specifically tailored interventions.

Critique of the Methods Used

Much of the examination on physical activity among people with disabilities used self-reported questionnaires (Brand, Alston, & Harvey, 2012; Froehlich-Grobe et al., 2014; Song et al., 2013; Vasuaevan, 2016). Researchers Rimmer et al. (2010) investigation of physical activity among the overweight and obese, disabled people employed a qualitative approach to ascertain the populations take and perceived barriers to the physical movement as a lifestyle choice. Numerous research desires to identify key variables that confirmed people with disabilities are more liable to lead a sedentary lifestyle regardless of the known benefits of physical movement (Boslugh & Andresen, 2006; Brown et al., 2005; Carroll et al., 2014; Cotter & Lachman, 2010; Escobar-Viera et al., 2014;). The disabled community needs possible answers to improve their overall health quality.

The studies in the literature review used small specific samples from a myriad of recruitment locations across the United States. Even the examinations that gather a sample from a national data set reduced the sample size because certain criteria specifics such as using only a particular state, which reduced the study's power. This research has drawn data nationally from the 2009 Behavioral Risk Factor Surveillance System (BRFSS). Therefore, the study should have ample statistical power because of a broad cross-section to gather information.

Summary

Although people with disabilities have unique needs, there is not a variety of what is an appropriate amount of time for exercise for an individual with a disability. The

guidelines for physical movement of disabled people are the same for the general population (Brown et al., 2005; Boslaugh & Andresen; 2006). If a person with a disability is required to meet the same physical activity criteria as an abled body individual without mobility restrictions, it will reduce a disabled person chance of meeting physical movement guidelines. Brown et al. (2005) investigation found that disabled persons can do some circulation and improve health status even if they fall short of the PA recommendation.

The physically handicapped population has more mobility limitations and more cause for barriers to impede their ability to meet physical activity recommendations than non-disabled individuals (Escobar-Viera et al., 2014; Rimmer et al., 2010). It would seem to reason that an ill person would have difficulty meeting the physical activity national guidelines. Therefore, physical movement guidelines for individuals with a disability needs to be adjusted to include any amount of 10 minutes of planned leisure time physical movement because research has confirmed that spurts of exercise for 10 minutes improves health (Song et al., 2013). Disabled people are more likely to be able to schedule 10 minutes of physical activity a day and maintain the behavior easier than carving out 30 minutes of movement daily.

Froehlich-Grobe (2014) analyzed how some physical activity increased the cardiovascular fitness of individuals bound to a manual wheelchair. The population increased their leisure time physical activity from less than six minutes a day to 17 minutes a day and severely reduced their fatigue and sleeplessness. The researchers had the respondents to record their sleep deprivation in a log, and they measured the activity

level by accelerometers. The authors used the social cognitive theory (SCT) and relapse prevention (RP) model to promote exercise among manual wheelchair obese women. Both theories are from a cognitive behavioral approach. The SCT looks at how individuals receive and maintain habits.

A wide range of health interventions uses the social cognitive theory. The relapse prevention (RP) model objective is to reduce risk behaviors in a person's lifestyle that may contribute to a relapse of prior conduct. The study explained how the environment played in the community's increase in physical activity. However, the authors' failed to explain the social support aspect of the respondent's overall improvement. There was no mention what part the participants family, friends, and colleagues played into their increase of six minutes daily movement to 17 minutes.

The majority of the examinations used a cross-sectional design to explain physical inactivity in the disabled population (Bosslaugh & Andresen, 2006; Brand et al., 2012; Brown et al., 2005; Carroll et al., 2014; Escobar-Viera et al., 2014; Pharr & Moonie, 2011; Song et al., 2013; Vasudevan, 2016). For example, Song et al. (2013) cross-sectional study explored the effects of physical activity on people with osteoarthritis to see if it would help reduce knee pain as well as decrease future mobility decline within the disabled population. The authors work supported previous studies that the use of a cross-sectional design in physical activity is a useful way to assess trends in the population at a specific point in time.

Another theme that physical inactivity cause among the disabled community is fatigue. Reseracher Pilutt et al. (2013) investigation chose to use a randomized controlled

study to demonstrate how physical activity is related to less fatigue, reduced risk of cardiovascular disease, better health quality and improved walking and balance among participants. The authors confirmed their hypotheses that increased physical movement would increase health quality and stamina. The researchers stressed that physical activity intervention needs to be devised to prompt the community to forgo sedentary behavior for more planned physical movement. The researchers highlighted that there are several constructs on disability that needs to be clear in future research because of some study's use disabled and disability interchangeably. However, other researchers separate them not fully explaining why?

Previous prospective cohort study's examinations illustrate the importance of removing perceived barriers to the disabled community becoming fit through daily physical activity. The study's evaluated the high ranking problems that people with disabilities view as an issue of getting out and moving their body's such as fear of being attacked and unsafe neighborhoods. Other causes of alarm were cars traveling too fast, and lack of transportation to fitness facilities (Brewer et al., 2014; Rimmer et al., 2010).

The previous randomized controlled trials investigations discussed the importance of comparing and contrasting the physical activity trends among races to ascertain the differences. The researchers presented that African Americans perform less physical activity than other racial groups (Frochlich et al., 2014). However, African American females were the least active regardless of disability (Frochlich et al., 2014; Pilutti et al., 2014).

In short, even though there is new research on the disability community and physical activity there is a limited amount of information on populations outside of the elderly community. There is a need to address other disabled sub-groups in research. This study has explored the disabled middle-aged African American female community to look at specific risk factors that may influence physical activity among people with disabilities. The proceeding chapter will explain the methodology and research design to explore the research questions, and hypotheses mentioned earlier by examing the effects of age, income, and education in disabled African American women 45 to 64 years of age when applied to physical activity.

Chapter 3: Research Method

Introduction

There is increasing research that supports the contention that the disabled community is in need of physical activity to improve members' overall health status as well as to reduce the risk of premature death (Brown et al., 2005; Carroll et al., 2014; CDC, 2015, Cotter & Lachman, 2010; Ekelund et al., 2015). The benefits of physical exercise outweigh the temporary discomfort of limited mobility, yet people with disabilities do not meet physical activity recommendations (Boslaugh & Andresen, 2006; Brand et al., 2012; Brewer et al., 2014; Brown et al., 2005; Carroll et al., 2014; Escobar-Viera et al., 2014; Pharr & Moonie, 2011; Song et al., 2013; Vasudevan, 2016). Several studies have demonstrated that if the population engages in daily scheduled physical movement, members' range of motion and balance will increase over time, improving health quality (Brown et al., 2005; Carroll et al., 2014; Frochlich-Grobe et al., 2014; Pilitti et al., 2014).

Additionally, the disabled community can prevent further decline of functional mobility through physical activity practice (Boslaugh & Andresen, 2006; Brown et al., 2005; Carroll et al., 2014; Frochlich-Grobe et al., 204; Pilitti et al., 2014; Song et al., 2013). Previous research has shown that there is a vast difference in physical movement frequency between the nondisabled population and people with disabilities (Rimmer et al., 2010). The remainder of this chapter addresses the design and approach used in this research, including the preexisting dataset, the method of data collection used, the

analysis conducted, and the rights of participants. This study employed the 2009 Behavioral Risk Factor Surveillance System (BRFSS).

Research Design and Approach

There is limited knowledge on physical activity risk factors among disabled middle-aged African American women age 45 to 64 (Brown et al., 2005; Carroll et al., 2014; Frochlich-Grobe et al., 2014; Pilitti et al., 2014; Pharr & Moonie, 2011; Rimmer et al., 2010; Vasudevan, 2016). The 2009 BRFSS was used to quantify the association. This study employed a cross-sectional secondary data analysis using a sample representative of a national survey. According to Fink (2010), secondary data are useful in health research because data allow a researcher to examine variables, inspecting possible associations.

The study aimed to test the following hypotheses:

1. The level of leisure-time physical activity among disabled middle-aged African American women is related to income after adjusting for age, education, marital status, children, smoking, emotional support, and life satisfaction.
2. The level of leisure time physical activity among disabled middle-aged African American women is related to education after adjusting for income, age, marital status, children, smoking, emotional support, and life satisfaction.
3. The level of leisure time physical activity among disabled middle-aged African American women is related to age after adjusting for income,

education, marital status, children, smoking, emotional support, and life satisfaction.

This research design used a cross-sectional approach with a secondary dataset, and the instrument was the 2009 Behavioral Risk Factor Surveillance System (BRFSS). Middle-aged African American women from 45 to 64 years of age who indicated that they had a disability constituted the population of study, and the association of various risk factors to physical activity was explored. The covariates were marital status, children, smoking, emotional support, and life satisfaction. The theoretical framework for this research was the socio-ecological model. As previously mentioned, research has suggested that physical activity behavior modification is related to multilevel interrelationships (Escobar-Viera et al., 204; McLeroy et al., 1988; Rimmer et al., 2010).

There is limited information available about people with disabilities and physical activity risk factors. Current knowledge about middle-aged African American women with disabilities and physical activity is sparse (Boslaugh & Andresen, 2006; Brown et al., 2005; Carroll et al., 2014; CDC, 2015; Cotter & Lachman, 2010; Pharr & Moonie, 2011; Rimmer et al., 2010). The use of a cross-sectional survey secondary dataset permitted me to obtain an adequate national representative sample at an efficient cost (Aponte, 2010; Smith et al., 201). Additionally, it permitted me to explore cause and effect within the chosen population (Ellis, 2010; Frankfort-Nachmias & Nachmias, 2008). Further, the use of a national survey from a secondary analysis strengthens external and internal validity (Ellis, 2010; Frankfort-Nachmias & Nachmias, 2008).

Methodology

The preexisting dataset used a cross-sectional survey. The data responses on disability and physical activity that were used for this study were the outcome of an individual cross-sectional survey examination through the 2009 BRFSS. The BRFSS uses specific criteria for its annual national survey (CDC, 2015). Each state collaborates with CDC and local public health departments to review the sampling methodology. Interviews begin in March. If there is a need to make changes in the sampling method, the state must notify CDC before any changes occur. The questionnaires administered in the BRFSS consist of three parts. First, the core component is a set of standard questions that all states must use. Next, the 19 optional BRFSS modules consist of sets of questions on specific topics and state-added questions (CDC, 2014). The interviewer retention rate for the BRFSS is very high (CDC, 2014). The BRFSS uses a computer-assisted telephone interview (CATI). The Ci3 WinCATI software program undergirds the CATI program. The core questions take about 18 minutes to answer.

Setting and Sample

This study used data collected from the 2009 BRFSS. The 2009 data from the BRFSS were used because these data were the most recent available to answer the research questions about disabled middle-aged African American women 45 to 64 years of age and physical activity. The BRFFS is the primary system for health-related telephone surveys in the United States and gathers information on personal health habits, preventive services, and risk behaviors (CDC, 2014). CDC has used the BRFSS annually since 1984 (CDC, 2014). The BRFFS uses cell phones as well as landline surveillance by

the state to assess individual health practices (CDC, 2014). According to CDC (2014), the BRFSS is the world's largest repeatedly administered health survey system with more than 400,000 noninstitutionalized adult interviews. The population is noninstitutionalized adult citizens in the United States 18 years of age and older.

The BRFSS uses a state sample design that falls within certain geographic boundaries (CDC, 2015). The sample can be done by specific counties and public health department regions, or by use of substate geography. The data collection structure for the BRFSS stratum is the same for the entire state (CDC, 2014). The BRFSS uses geographic stratification. Each state is given phone numbers by CDC to call. The BRFSS uses two samples: one for landline telephone respondents and one for mobile respondents. Individuals are randomly selected.

Power Analysis

To ensure that a study's findings are an accurate indication of what is occurring in the population being explored, there is a general rule of a two-tailed 95% confidence interval that is applied (Frankfort-Nachmias & Nachmias, 2008). There is also a shared use in research of 80% statistical power (Ellis, 2010). Power analysis helps the investigator detect whether there is an actual significant difference and reduce type II errors (Frankfort-Nachmias & Nachmias, 2008). The standard alpha level used in research is 0.05. The calculation of power and sample size was performed through the G*Power program.

An a priori power analysis was conducted using G*Power 3.1.9.2 to generate a sample size estimate for the ANOVA statistical analysis that was used in this research

project. To prevent a false positive or type I error, this study employed an alpha level of 0.05 and determined the sample size using 0.80 power. The use of 0.80 power delivers an 80% chance of either accurately or inaccurately rejecting the null hypothesis. That is to say that 1 in 5 times, a real difference is missed (Kadam & Bhalerao, 2010).

It is vitally important to determine the proper sample size to administer an examination that accurately represents the community under investigation. The minimum sample size needed for this research project was 395. In the 2009 BRFSS Codebook, 45,467 people answered *yes* to having a disability and needing some special equipment. A crosstabulation displayed that there were 1,599 middle-aged disabled African American females 45 to 64 years of age.

Assumptions

I assumed that the dependent variable was continuous (Cronk, 2012) and that the study had two or more explanatory variables (Forthofer, Lee, & Hernandez, 2007). Another assumption was that there was a linear relationship between the outcome variable and the predictor variables (Cronk, 2012). Further, there should be no significant outliers and no multicollinearity, and the data should normally be distributed (Forthofer et al., 2007; Frankfort-Nachmias & Nachmias, 2008).

Selection Criteria

For this research project, the sample consisted of middle-aged African American women from 45 to 64 years of age who gave a *yes* response to being disabled, defined by the use of some form of special equipment. The physical activity information of middle-aged African American women with disabilities was categorized.

Instrumentation

The variables used in this study were pulled from the 2009 BRFSS three core components. The rationale for using the BRFSS was that it is a national dataset that has data on this study's chosen population, is reliable, has been used in similar studies, and is cost effective. The BRFSS is a CDC dataset that is available to the public and may be used to conduct independent research free of charge. Permission is not needed to access the dataset.

Data Weighting

Design weighting was conducted in the BRFSS to decrease bias because of the unequal probability of selection. In 2009, to balance for the overlapping of the sample frame of those individuals who had both landline and cell phones, there was a need for modification of the design weights. Iterative proportional fitting or gathering was used in the BRFSS to balance for differences in demographics among sampled individuals and the people they represented. The weighting method consisted of design weight and raking. Model weights were calculated using the weight of each geographic stratum (_STRWT), the number of landline phones within a household (NUMPHON2), and the number of adults who used those phones (NUMADULT). For cell phone respondents, both NUMPHON2 and NUMADULT had a setting of 1.

Dependent Variable

The dependent variable in this research was physical activity frequency, which was a continuous variable. This examination measured physical activity by minutes per

week. Physical activity is any physical movement of the skeletal muscle that causes an oxygen deficit demanding more energy than a person needs at rest to complete the task.

Independent Variables

The primary independent variables in this research project were income, education, and age. For this project, income was measured at the interval level. At the interval level, the difference between the values was meaningful (Forthofer et al., 2007). Education is an ordinal variable that has an exact order (Frankfort-Nachmias & Nachmias, 2008). Age is a continuous variable because it can have any value within a range (Frankfort-Nachmias & Nachmias, 2008). However, for this study, age was changed to a categorical variable because this investigation explored African American women aged 45 to 64. The study's covariates were marital status, children, smoking, emotional support, and life satisfaction because they have been shown in similar studies to impact the population's outcomes.

Data Analysis

This research project employed an ANOVA to examine the hypotheses. To assess the association between physical activity and the predictor variables of age, income, and education, a general linear model ANOVA was administered (Forthofer et al., 2007). Multivariate statistical analysis is used for two-way tests for comparing the means among separate groups (Forthofer et al., 2007). The explanatory variables are observed to see how they affect the dependent variable (Forthofer et al., 2007). The response variable is what the researcher is trying to legitimize (Frankfort-Nachmias & Nachmias, 2008). The 2009 BRFSS weighted the data for this study.

The general standard for the research project is that there is a 5% confidence interval, a 95% confidence level allotment, and 80% power in an investigation (Faul, Erdfelder, Lang, & Buchner, 2007). This research project allowed a margin of error of 0.05. The confidence interval indicates how close an examiner can anticipate the survey outcome to occur to the actual population value (Forthofer et al., 2007). This study also used a 95% CI and 80% power. A study's power increases as the sample size increases (Faul, Erdfelder, Lang, & Buchner, 2007). This investigation needed a sample size of 395 individuals to conduct a linear multiple regression fixed model single regression coefficient statistical test (Ellis, 2010; Faul, Erdfelder, Lang, & Buchner, 2007). There were three predictors for this study. The noncentrality parameters were 2.8106939, a critical *t* of 1.9660497, and a degree of freedom of 391 (Faul, Erdfelder, Lang, & Buchner, 2007). The BRFSS 2009 data contain 1,599 disabled African American female cases.

The data were screened to foresee any problems involving missing data or outliers and checked to ascertain whether the relationship was linear (Frankfort-Nachmias & Nachmias, 2008). If a value is three deviations above or below the mean, it is an outlier (Forthofer et al., 2007; Frankfort-Nachmias & Nachmias, 2008).

Validity

External

A threat to external validity is that the population examined was a subgroup. Subgroups are smaller portions of the general population, usually minorities (Kendall, 2006). Disabled middle-aged African American women 45 to 64 years of age constitute

such a particular group that the findings may not be generalizable to other groups at other times (Trochim, 2006). Trochim (2006) wrote that the three greatest threats to external validity are people, place, and time.

Internal

The threat to the internal validity is that I may have omitted an important confounder from the model (Antonius, 2013; Green & Salkind, 2014). Confounder delivers an alternate explanation for the relationship of difference between variables (Green & Salkind, 2014). To ensure that the systematic change that has occurred in the variables are from the variables of interest the covariates that can affect the outcome must be controlled (Antonius, 2013). The threats to the construct or statistical conclusion can be due to a bad instrument or low statistical power. For that reason, the examiner applied an 80% power when conducting the analysis using the 2009 BRFSS.

Ethical Considerations

This research proposal was approved by Walden University IRB before the data was reviewed to ensure the protection of participants' rights. The BRFSS is a public dataset that is considered acceptable for the use of research which is accessible from the source and does not require IRB approval (Florida International University, 2016). The BRFSS does not gather biological samples to evaluate health or disease disorder (FIU, 2016). Nevertheless, respondents' confidentiality was protected. All personal demographics are coded during the data organizing and are removed from the dataset before it is available for public use. All personal identifiers have been withdrawn before

public use accessibility to eliminate harming the respondents. The public dataset was removed from my computer at the completion of this research project.

Summary

Chapter 3 provides the methodology that was used in this research. This study utilized a cross-sectional secondary data analysis from the 2009 BRFSS. A quantitative design was used to examine physical activity risk factors among disabled middle-age African American women 45 to 64 years of age. Even though a representative sample from 2009 BRFSS national survey was used the findings might not be generalizable across the United States because it is a sub-group. The proceeding chapter will include information on the data collection and results of the analysis.

Chapter 4: Results

Introduction

My intention in this study was to explore possible risk factors related to habitual moderate leisure time physical activity among disabled middle-aged African American women 45 to 64 years of age. A study's sample, data analysis requirements, and sample strategies are all dependent on the research design and purpose (Fink, 2009). A general linear model ANOVA was conducted to compare the means of moderate leisure time physical activity of disabled African American women 45 to 54 years of age to those of disabled African American women 55 to 64 years of age, while controlling for smoking, children, marital status, emotional support, and life satisfaction, because these covariates have affected physical activity outcomes in similar studies. A frequencies analysis was administered for the categorical variables, and a descriptive analysis was conducted for the continuous variable. Chapter 4 contains the details of data collection, the data analysis performed, the demographics of the population, the results, and a summary.

The following hypotheses were tested in this study:

H0 1: Leisure time physical activity among disabled middle-aged African American women is related to income after adjusting for age, education, marital status, children, smoking, emotional support, and life satisfaction.

H0 2: Leisure time physical activity among disabled middle-aged African American women is related to education after adjusting for income, age, marital status, children, smoking, emotional support, and life satisfaction.

H0 3: Leisure time physical activity among disabled middle-aged African American women is related to age after adjusting for income, education, marital status, children, smoking, emotional support, and life satisfaction.

Data Collection

I obtained the study data from a preexisting data set: the 2009 BRFSS. The BRFSS contains public access data available on CDC's website. The participants for this study were randomly selected from throughout the United States via landline telephones and cell phones by the 2009 BRFSS recruiters. The 2009 BRFSS data were reviewed, and the select cases filter was used in SPSS version 21 to single out individuals who met the inclusion criteria for this study of African American women who were aged 45 to 64 and disabled. A complex sample plan was created, selecting cases that were disabled middle-age African American women 45 to 64 years of age.

For the dependent variable, moderate physical activity time, data were coded as continuous to describe how many minutes the population spent in moderate leisure time physical activity. Several variables were transformed to meet assumptions. Income was not normally distributed, so it was broken into five categories. Age was transformed from a continuous variable to a categorical variable because only African American women from ages 45 to 64 were selected for this study. Education was divided into five groups.

Study Population

The selected sample was an appropriate representation of the population because the individuals were from a national governmental agency (CDC, 2015). The BRFSS is the oldest annual national health survey in the United States (CDC, 2015). The selected

sample for this study was drawn from the 2009 BRFSS, with 1,599 middle-aged African American female respondents attesting to being disabled. The participants were suited to the research questions that were formulated to guide this study.

Demographic Data

Demographic specifics were as follows. Regarding race, the sample population consisted of African Americans. Regarding gender, the sample consisted of women. The population consisted of people with disabilities. The age ranged from 45 to 64 years of age. The individuals were grouped by age; each group consisted of 10 years. For example, Group 1 ranged from 45 to 54 years of age, and Group 2 ranged from 55 to 64 years of age.

This study selected individuals who provided a yes response indicating a health problem that required the use of some special equipment such as a cane, wheelchair, and or special bed. The rationale for using individuals who responded yes to indicate needing special equipment was that this study was concerned with middle-aged African American women 45 to 64 years of age who were physically disabled. The frequency percentages for the study's categorical variables and the means for the continuous variable are displayed in Table 2.

Table 2

Descriptive Statistics

Variable	Estimate	Std. error	95% CI	Unweighted count
Income				
$0-$14,999	40.3%	2.4%	35.6% - 45.1%	607
$15,000-$24,999	31.9%	2.3%	27.5% - 36.7%	431
$25,000-$34,999	9.5%	1.2%	7.4% - 12.2%	146
$35,000-$49,000	7.2%	1.1%	5.4% - 9.6%	89
$50,000 and above	11.0%	1.6%	8.1% - 14.6%	126
Total	100%	0.0%	100%	1399
Education				
Grades 1-8	3.6%	0.7%	2.4% - 5.2%	87
Grades 9-11	15.7%	1.4%	13.1% - 18.7%	270
High school grad/GED	37.6%	2.3%	33.2% - 42.1%	606
Some college	27.8%	2.0%	24.0% - 31.8%	416
College graduate	15.4%	1.5%	12.8% - 18.6%	252
Total	100%	0.0%	100%	1631
Age				
45-54	41.8%	2.3%	37.3% - 46.4%	606
55-64	58.2%	2.3%	53.6% - 62.7%	993
Total	100%	0.0%	100%	1599
Moderate PA time	125.88	10.521	105.21-146.54	922

Data Analysis

SPSS version 21 was used to conduct descriptive statistics to perform frequency and percentages analysis to describe study participants. All the respondents were taken

from the 2009 BRFSS. Although there were 1632 persons, who answered yes to being physically disabled not every case was valid for the analyses. For instance, a total of 904 unweighted cases data were analyzed for age. There were 815 unweighted cases examined for income. Education had 921 unweighted cases investigated. There was a total of 780 cases observed in the multivariate model with age, income, education, marital status, children, smoking, emotional support, and life satisfaction in (Table 7).

Results

Descriptive Statistics

The descriptive statistics for unweighted frequencies revealed the following about the study respondents. The populations' variable income divulged that 40.3% (n = 607) had an annual income of less than $15,000 a year. The next income group, less than $25,000, comprised 31.9% (n = 431) of the community. The community's third income category, less than $50,000, accounted for 7.2% (n = 89), and individuals with a household revenue greater than $50,000 represented 11.0% (n = 126) of the disabled middle-aged African American females 45 to 64 years of age.

Data for the variable of education indicated that 3.6% (n = 87) of the individuals' highest education level was from Grades 1 to 8. Study participants with a ninth- to 11th-grade education represented 15.7% (n = 270) the population, and high school graduate/GED comprised the largest group, at 37.6% (n = 606). The next largest education group was some college, with 27.8% (n = 416) of the community's respondents. College graduates represented 15.4% (n = 252) of the disabled middle-aged African American female population. Age data indicated that 41.8% (n = 606) of the

respondents were 45 to 54 years of age and 58.2% were 55 to 64 years of age. The population's mean for moderate physical activity time was 125.88. The 95% confidence interval ranged from 105.21-146.54.

Univariate Analysis

A univariate analysis was performed for each independent variable to assess its relationship to moderate physical activity in disabled African American females 45 to 64 years of age (see Table 3). The younger disabled African American women (ages 45 to 54) reported more minutes of moderate leisure time physical activity than the older women (estimate = 76.012, p = .001). Respondents who had the least education were more physically active than persons who had graduated from college (estimate = 142.522, p = .001).

Women in the second largest income group ($35,000 to $49,999) performed more minutes of physical activity than people earning $50,000 or more (estimate = 184.590, p = .000). Respondents with a yearly household revenue of $15,000 to $24,999 displayed a significant difference as well (estimate = 56.562, p = .024).

Table 3

Univariate Analysis

Variable	*N*	Estimate	95% CI	*t*	*p*
Age	904				
45-54	43.9%	76.012	33.099-118.925	3.479	.001
55-64	56.1%				
Education	921				
Grades 1-8	2.0%	142.522	61.253-134.127	3.444	.001
Grades 9-11	13.4%	15.605	-58.119-89.329	.416	.678
HS grad/GED	38.8%	30.152	-23.163-83.468	1.111	.267
Some college	30.5%	31.492	-11.115-74.099	1.452	.147
College graduate	.000				
Income	815				
$0-$14,999	38.6%	39.709	.262-79.157	1.978	.049
$15,000-$24,999	30.95%	56.562	7.399-105.725	2.260	.024
$25,000-$34,999	9.3%	12.004	-27.055-51.063	.604	.546
$35,000-$49,999	6.9%	184.590	114.220-254.960	5.153	.000
$50,000 and above	14.3%	.000			

Multivariate Analysis

The results of the multivariate analysis after adjusting for the covariates are presented in Table 4. The covariates were marital status, number of children, smoking, life satisfaction, and get emotional support. The multivariate model estimate indicated that the younger members were more physically active than individuals in, the older group (estimate = 55.212, *p* value = .011). Although PA was greater for younger respondents, education did not contribute to greater physical movement. The model revealed that persons with the lowest education level (Grades 1-8) engaged in more physical movement than their more educated counterparts (estimate = 123.374, *p* value = .014). In the same manner, people with an average annual income of $15,000-$24,999 demonstrated a significant difference from the highest income group (estimate = 63.520, *p* value = .018). None of the other variables in the model were statistically significant.

Table 4

Multivariate Analysis

Variable	Estimate	95% CI	*t*	*p*
Age				
45-54	55.212	12.684-97.741	2.551	.011
55-64	.000			
Income				
$0-$14,999	41.979	-11.236-95.194	-.429	.122
$15,000-$24,999	63.520	11.005-115.985	1.550	.018
$25,000-$34,999	14.154	35.412-63.721	2.379	.575
$35,000-$49,999	59.898	-6.392-126.188	.561	.076
$50,000 above	.000			
Education				
Grades 1-8	123.374	24.945-221.803	2.463	.014
Grades 9-11	-14.978	-110.965-81.009	-.307	.759
High school grad/GED	-10.175	-68.270-47.920	-.344	.731
Some college	-24.766	-81.312-31.780	-.861	.390
College grad	.000			
Marital status				
Married	45.356	-24.826-115.537	1.270	.205
Divorced	55.332	-21.389-132.053	1.417	.157
Widowed	25.173	-45.773-96.119	.697	.486
Separated	31.143	-61.707-123.992	.659	.510
Never married	17.183	-61.561-95.926	.429	.668
Unmarried couple	.000			
Children				
0	29.546	-25.074-84.165	1.063	.288
One child	44.839	-44.822-134.500	.983	.326
Two children	1.501	-90.004-93.007	.032	.974
Three children	-38.380	-119.088-42.327	-.934	.351
Four children	-37.530	-110.263-35.04	-1.014	.311
Five or more children	.000			
Smoking				
Yes	14.741	-17.190-46.671	.907	.365
No	.000			
Emotional support				
Always	2.484	-43.185-48.153	.107	.915
Usually	23.250	-45.126-91.626	.668	.504
Sometimes	7.164	-44.651-58.980	.272	.786
Rarely	55.478	-70.373-181.330	.866	.387
Never	.000			
Life satisfaction				
Very satisfied	1.517	-83.201-86.234	.035	.972
Satisfied	5.959	-74.847-86.764	.145	.885
Dissatisfied	39.319	-56.194-134.831	.809	.419
Very dissatisfied	.000			

Summary

The first research question concerned whether income can predict leisure time physical activity in disabled middle-aged African American women when controlling for education, age, marital status, children, smoking, emotional support, and life satisfaction. The findings revealed that minutes of moderate physical activity among disabled middle-aged African American women were related to income after adjusting for age, education, marital status, children, smoking, emotional support, and life satisfaction. Therefore, the null was rejected. The alternative hypothesis was supported that income was a significant predictor of physical activity among disabled middle-aged African American women 45 to 64 years old. The findings were counter to expectations, with women in the highest income group reporting less physical activity. Usually, individuals with more revenue have greater physical activity.

The second research question concerned whether age can predict leisure time physical activity in disabled middle-aged African American women when controlling for education, income, marital status, children, smoking, emotional support, and life satisfaction. I found that age can predict leisure time physical activity in disabled middle-aged African American women 45 to 64 years of age when controlling for children, marital status, smoking, emotional support, life satisfaction, education, and income. Younger women reported more minutes of moderate physical activity.

The third research question addressed whether education can predict leisure time physical activity in disabled middle-aged African American women when controlling for age, income, marital status, children, smoking, emotional support, and life satisfaction.

Education demonstrated an unexpected pattern, in that people with the lowest education level had the greatest physical activity. Therefore, the alternative hypothesis held true that education can predict leisure time physical activity in disabled middle-aged African American women 45 to 64 years of age when controlling for children, marital status, smoking, emotional support, life satisfaction, income, and age.

This chapter has described the respondents, demographics, data analysis process, and results of the study. In Chapter 5, I discuss the results, limitations, and implications of this study and present recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Research has confirmed that people with disabilities are more physically inactive than nondisabled persons (Boslaugh & Andersen, 2006; Brown et al., 2005; Carroll et al., 2014; Vasudevan, 2016). Failure to engage in regular leisure time physical activity increases the population's risk of further mobility limitations as members age (Pharr & Moonie, 2011; Rimmer et al., 2010).

The literature evaluated for this study examined the relationship that intra- and interpersonal relationships have with physical activity in mid to late life among disabled African American women (Boslaugh & Andersen, 2006; Brown et al., 2005; Escobar-Viera et al., 2014; Pharr & Moonie, 2011; Schoeny et al., 2017). Researchers have analyzed the connections of marital status, educational level, income, number of children, smoking, and social support to physical activity in women with disabilities (Boslaugh & Andersen, 2006; Brand et al.' 2012; Brown et al., 2005).

This study was founded on past studies demonstrating that age, income, education, life satisfaction, and emotional support play a part in physical activity for middle-aged women with disabilities (Carroll et al., 2014; Escobar-Viera et al., 2014; Mama, Diamond, et al., 2015; Rimmer at al., 2010; Schoeny et al., 2017). Mama, McCurdy, et al. (2015) revealed that participants with the greatest annual income had the most activity. In Mama, McCurdy, et al., Nearly 42% of the participants had a yearly household revenue of $82,600. Social support was the leading influencer of physical movement in people with disability in the Chicago area (Vasudevan, 2016). According to

Escobar-Viera et al. (2014), social support fostered conduct modification in women with disabilities.

This study aimed to explore possible risk factors in relation to habitual moderate leisure time physical activity among disabled middle-aged African American women 45 to 64 years of age. This study revealed that age is a significant predictor of physical activity in disabled middle-aged African American women from 45 to 64 years of age. Younger women were more physically active than their older counterparts. However, education and income were not significant predictors of physical activity in disabled middle-aged African American women age 45 to 64. I conducted univariate and multivariate analyses to observe the relationship of moderate physical activity time with age, income, and education in disabled middle-aged African American women aged 45 to 64.

Interpretation of the Findings

This examination measured the connection of age, income, and education with physical activity for middle-aged African American physically disabled women. I focused on the elements that might influence leisure time physical activity in middle-aged African American women with disabilities. Similar studies have suggested that members of the physically disabled population are not active enough to achieve health improvement (Brown et al., 2005; Carroll et al., 2014; Pharr & Moonie, 2011; Rimmer et al., 2010).

In fact, current literature indicates that African American females with disabilities are the least physically active among minorities (Brown et al., 2005; Boslaugh &

Andresen, 2006; Carroll et al., 2014; Escobar-Viera, 2014; Jones, Schumach, & Hall, 2014; Pilutti et al., 2014). The purpose of the current research was to increase the body of knowledge on moderate leisure time physical activity among middle-aged African American women with disabilities.

Several areas were measured that might impact moderate leisure time physical activity in the disabled middle-aged African American woman. The areas that were examined in this research to observe how they influenced physical movement among middle-aged African American women with disabilities were age, income, education, children, marital status, smoking, life satisfaction, and emotional support.

Education

The results that the current study generated were similar to those of a study by Vasudevan (2016) on the disabled population. The multivariate analysis results for education were that 15.4% had less than a high school education. Individuals with a high school diploma or GED represented 38.6% of the sample. Respondents who had some college education represented 30.4%. Individuals with a college degree constituted 15.7% of the population.

Unexpectedly, women with the least education reported significant moderate leisure time physical activity. The univariate estimate = 142.522, $P = .001$, and the multivariate estimate = 123.374, $P = .014$. This study results revealed that education was not a significant predictor of leisure time physical activity among disabled middle-aged African American women 45 to 64 years of age.

Income

I found that 38.8% of respondents had an annual revenue of less than $15,000 a year. Participants who had an annual income of less than $25,000 represented 31.4% of the sample. Individuals who had a yearly income of less than $35,000 were 9.5% of the population. Additionally, 6.9% of the participants had a household income of less than $50,000. Respondents with incomes greater than $50,000 constituted 14.3% of the sample.

Literature by Brand et al. (2012), Escobar-Viera et al. (2014), Mama, McCurdy, et al. (2015), and Pharr and Moonie (2011) has suggested that individuals with the greatest income engage in the greatest physical movement. However, the findings of this research were different. Respondents with household incomes less than $50,000 participated more in moderate leisure time physical activity. For example, the univariate estimate = 184.590, $P = .000$ for people with yearly incomes of $35,000-$49,999. The multivariate estimate = 63.520, $P = .014$ for individuals with annual incomes of $15,000-$24,999. Group 1 had the highest moderate leisure time physical activity, suggesting that income is not a significant predictor of physical activity among disabled middle-aged African American women 45 to 64 years of age.

Age

Most of the respondents were in the older group (Group 2). Even though group 2 members were the least physically active, they had the most people. The younger participants engaged in more moderate leisure time physical activity. The younger

members univariate estimate = 76.012, *P* = .001; the multivariate estimate = 55.212, *P* = .011

The results of this study indicate that age is a significant predictor of leisure time physical activity in middle-aged African American women with disabilities aged 45 to 64 years.

Marital Status

Among respondents, 24.0% of the women were married. In contrast, 24.6% of the population were divorced. Of the respondents, 13.3% were widowed, 10.0% were separated, 26.6% had never married, and 1.5% were members of unmarried couples. No category in marital status was statistically significant.

Children

The majority of the participants (68.1%) had no children. Participants with one child represented 17.2% of the sample. Individuals with two children were 6.8% of the population, and 2.7% had three children, 0.6% had four children, and 4.7% had five or more kids. Based on a study by Brown et al. (2005), it was expected for more of the population to have children and for having children to have more of an impact on moderate leisure time physical activity. No category in the variable children was significant.

Get Emotional Support

The results this study indicated that 40.5% of the population always received emotional support, whereas 16.3% usually received emotional support. Respondents who sometimes received emotional support constituted 25.7% of the population, whereas

7.9% rarely got emotional support and 9.6% never got emotional support. In this research, emotional support was not a factor in the population's leisure time physical activity. In contrast, in studies by Escobar-Viera et al. (2014) and Rimmer et al. (2010), emotional support impacted physical activity among the disabled community. There were no significant differences in the variable of emotional support.

Life Satisfaction

Among respondents, 23.7% were very satisfied, 62.6% were satisfied, 9.5% were dissatisfied, and 4.2% were very dissatisfied with their lives. Boslaugh and Andresen (2006) reported that disabled individuals who were not happy with their lives self-reported having worse quality of health and life. Life satisfaction was not statistically significant.

Smoking

The sample consisted mostly of smokers. Among respondents, 52.4% answered *yes* to smoking, whereas 47.6% indicated that they did not smoke. Smoking has been related to low physical activity in the disabled community (Brown et al., 2005; Carroll et al., 2014).

The individuals in this study were middle-aged African American females with disabilities who were 45 to 64 years of age. The majority were smokers, with a high school education, who never married and had no children. Their annual household income was less than $25,000 a year. I was expecting to see affluent disabled middle-aged African American women who were older, who were married, who had no children, who had college degrees, who did not smoke, and who had an annual household income

greater than $50,000 engaging more in physical activity than their younger, less educated counterparts.

From an ecological theory viewpoint, middle-aged African American women 45 to 64 years of age with a physical disability share common characteristics with members of their community such as smoking, having no children, having a low education level, experiencing satisfaction with their lives, and receiving emotional support. All of the items above contribute to moderate leisure time physical activity. Ecological theory suggests that multilevel relationships play a role in habitual behavior within a community.

Limitations of the Study

This study had several limitations. The first is that this study population was selected from the 2009 BRFSS, which was a national cross-sectional health survey that was used in its entirety to represent the United States. Another limitation was that only a portion of a subgroup of the 2009 BRFSS was used for this study. Even though the population sample was adequate to answer the research question, the results may not be generalizable to other populations (e.g., nondisabled women).

Control variables were limited to those available in the dataset. Sources of income were not known and could have biased the findings. For example, women who received disability income may have had higher incomes along with more severe limitations. This could have resulted in the observed inverse relationship between income and physical activity.

Another limitation was that individuals with a lot of vigorous physical activity were not removed so that they might have introduced error into the research calculations. However, aside analysis comparing minutes of moderate and intensive physical activity did not reveal an inverse relationship, so I do not suspect that bias would arise from ignoring intensive physical activity. Moreover, this study examination did not consider the broader spectrum of the disabled community and therefore may have under- or overestimated the physical activity level of people with disabilities.

Recommendations

In this cross-sectional research, I used a quantitative approach to explore possible risk factors in relation to physical activity participation for disabled middle-aged African American women aged 45 to 64 years. Future research could use a mixed-method design to assess the factors that influence leisure time physical activity in this community. If the respondents were a part of a focus group, deeper insight might be obtained on how to accommodate this population best.

Additionally, researchers could explore more variables in physical activity maintenance to develop more knowledge about how to keep the community physically active throughout life, which might lessen disease burdens on individuals and society.

Implications

Research confirms that most disabled people in the United States are not physically active (Brown et al., 2005; Carroll et al., 2014; Pharr & Moonie, 2011; Rimmer et al., 2010). Not engaging in physical movement increases such individuals' risk of further health decline (CDC, 2015; Lachman & Agrigoroaei, 2010; Regnaux et al.,

2015). As stated by CDC (2009), in the United States, 19% of the population is disabled. Nearly one-fifth of the population consists of people with disabilities. If the community does not engage in physical movement, that means a greater likelihood of ailments and premature death as the population ages (CDC, 2015; Lachman & Agrigoroaei, 2010; Regnaux et al., 2015).

Ecological theory looks at relationship dynamics to assess how intra- and interpersonal, community, and organizational relationships affect individuals' behaviors. The theoretical implication is that individuals with sufficient emotional support are more physically active (Carroll et al., 2014; Escobar-Viera et al., 2014; Rimmer at al., 2010; Mama, Diamond, et al., 2015; Schoeny et al., 2017). For that reason, more knowledge on disabled middle-aged African American women can help to reduce health disparities for this community.

Physical inactivity increases burdens on society because inactive individuals' health will decline as they age (CDC, 2015; Lachman & Agrigoroaei, 2010; Regnaux et al., 2015). Physical inactivity accounts for more premature deaths globally than any other disease (Ekelund et al., 2015; Pharr & Moonie, 2011; Song et al., 2013).

Problems associated with diseases such as multiple sclerosis can be better managed through physical movement (Pilutti et al., 2014). Boslaugh and Andresen (2006) and Brown et al. (2005) agreed that disabled people who are not physically active are more likely to be overweight than people who move their bodies. According to Pharr and Moonie (2011) and Song et al. (2013), people who are not physically active experience more health problems over their lifespan.

The social change implications of this study are far reaching because the findings suggest that health program interventions can profitably be targeted toward older African American women (ages 45 to 64), thus leading to improvements in their overall health status and quality of life. Knowledge gleaned from this study may assist policymakers in their decisions to allocate funds to meet this population's health needs. Local stakeholders can lobby for better physical activity guidelines to improve the community's health practice, which would help members of society to be more fit as they age.

Conclusion

This study's objective was to examine possible risk factors in relations to regular moderate leisure time physical activity among disabled middle-aged African American women 45 to 64 years of age. Although younger age, lower income, and lower education were significant predictors of physical activity in disabled middle-aged women 45 to 64, demographic variables, smoking, and emotional support were not.

Some of the results of this investigation were contradictory to what I anticipated. For example, lower education was a significant predictor of physical activity in disabled middle-aged African American women age 45 to 64 years. Additionally, lower income was a significant predictor of physical activity in disabled middle-aged African American women 45 to 64 years of age. These counterintuitive findings may have been due to unmeasured vagaries in the sample. For example, disability income might result in higher incomes for persons who are more disabled.

Currently, the research on people with disability is sparse. The present study was the first research on disabled middle-aged African American women aged 45 to 64. More

exploration needs to be done on this population because the middle-aged community is less active than other age groups (CDC, 2015). The disabled middle-aged population is even less active (CDC, 2015; Lachman & Agrigoroaei, 2010; Regnaux et al., 2015). Further, African American women have disproportionate negative health outcomes compared to their Caucasian counterparts (Boslaugh & Andresen, 2006; Brand et al., 2012; Brown et al., 2005; CDC, 2015). Therefore, the more information researchers obtain on this population, the more likely it will be that health outcomes and lifespans will improve for this community, in that more physical movement leads to more life.

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