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The Determinants of Physical Activity in Rural Women, Ages 20-44 Years

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THE DETERMINANTS OF PHYSICAL ACTIVITY IN RURAL WOMEN, AGES 20-44 YEARS

by

DZIYANA NAZARUK

(Under the Direction of Stuart H. Tedders)

ABSTRACT

Despite multiple health benefits of exercise, it is reported that only 14.7% of American women engage in the recommended amount of physical activity. Whereas the potential negative consequences of not exercising are well documented, there is a scarcity of literature that investigates the determinants of physical activity in rural women. The purpose of this concurrent transformative mixed method study was to explore the determinants of physical activity in rural women ages 20-44 years. Specific quantitative research questions addressed the relationship between the determinants of physical activity on intra- and interpersonal levels, as well as the current physical activity status of respondents. Strength training was the focus of qualitative research. In-depth interviews were utilized to identify the perceptions, knowledge, motivation, and skills regarding strength training. The study was guided by Self-Determination Theory.

The quantitative portion of this research utilized a survey to collect data on a cluster sample of 184 women 20-44 years of age who resided in four rural counties in Georgia: Clinch, Toombs, Jeff Davis, and Pulaski. The qualitative portion of this research utilized in-depth interviews with 15 women from the four target counties.

The majority of the participants reported moderate physical activity levels; however, a significant percentage of rural women remain inactive. The results indicated that the highest type of motivation for physical activity among rural women was identified regulation. Moreover, husband's support seems to have a stronger effect on physical activity levels when compared to other sources of social support. The results of this study also suggest that a history of sports participation can lead to the formation of intrinsic motivation. Factors such as the lack of knowledge about strength training and the lack of skills can possibly explain some of the reasons for low strength training participation among rural women in Georgia.

Due to the fact that rural areas are deprived of economic and financial resources, it is especially important for health care providers to use these findings to better understand the intra- and interpersonal determinants of physical activity in rural women in order to develop the most effective physical activity interventions.

INDEX WORDS: Public health, rural health, women's health, physical activity, strength training, prevention, Self-Determination Theory.

“THE DETERMINANTS OF PHYSICAL ACTIVITY IN RURAL WOMEN, AGES 20-
44 YEARS

by

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DOCTOR OF PUBLIC HEALTH

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DEDICATION

I dedicate this dissertation to my loving parents (Leonid and Elena Nazaruk) who have always been my biggest supporters. It is their unconditional love that motivates me to set higher goals. They have been there for me throughout the entire doctorate program. I also dedicate this dissertation to my brother (Dima Nazaruk), my aunt (Dr. Maria Shigalova), and my grandparents (Alexander and Eugenia Kozel), who have always provided me with encouragement and strong love. Finally, I dedicate my dissertation to my closest friends. I will always appreciate all that they have done.

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CHAPTER I

INTRODUCTION

The topics covered in this section include background information, physical activity, strength training, significance of the problem, and purpose of the study.

Background

According to Kohl et al. (2012), physical inactivity is the fourth leading cause of death worldwide. It is well established that Americans, both adults and children, do not get the recommended amounts of physical activity each week, and this lack of activity is associated with significant health problems (World Health Organization [WHO], 2013). In fact, it is estimated that vigorous activity among American adults may prevent 35% of deaths due to coronary heart disease (CHD), 32% of deaths due to colon cancer, and 35% of deaths due to diabetes (Powell & Blair, 1994). Reduced physical activity levels also significantly contribute to the development of obesity, which can potentially result in multiple negative health outcomes (Heini & Weinsier, 1997).

According to the Centers for Disease Control and Prevention (Centers for Disease Control and Prevention [CDC], 2012), Americans living in the South are less physically active than Americans living in the West, Northeast, and Midwest regions of the country. The rate of physical activity is known to be higher among men, and women have lower rates of physical activities throughout all stages in life (Larouche, Laurencelle, Shephard, & Trudeau, 2012). Despite the multiple health benefits of exercise, it is reported that only 14.7% of American women engage in the recommended amount of physical activity from 2007-2009 (US Department of Health and Human Services, 2010). In addition, women

residing in rural areas were found to be less physically active than urban women, and they tend to report more personal barriers as compared to their urban counterparts (Barnes & Klug, 1999; Wilcox, Castro, King, Houseman, & Brownson, 2000).

Whereas the potential negative consequences of not exercising are well documented, there is very little literature that investigates the determinants of physical activity in rural women. In order to receive maximal health benefits from exercise, good habits must form early and these habits must persist through-out the individual's life. Whereas early engagement in physical activities is essential, the research suggests that a significant decline in physical activity level is often observed over the course of one's life. According to Larouche et al. (2012), physical activity in adults may decline from 70.0% during the adolescent period to as little as 17.0% by the time the individual's first child is born. It was also reported that during the transition from adolescence to young adulthood, the overall percentage of inactive people increased from 2.8% to 23.4%. By the time participants marry, 60.1% were physically inactive (Larouche et al., 2012). In addition to life stage, physiologic development of the individual also has a significant role in predicting levels of physical activity. In the case of females, the bone building years that occur prior to the age of 30 years are crucial for achieving peak bone density (Schettler & Gustafson, 2004). Adequate physical activity early in life is necessary to facilitate bone adult bone density, which is vital in preventing osteoporosis later in life.

Physical Activity

Physical inactivity is a major public health issue in the United States. As a consequence, a goal of Healthy People 2020 is to reduce the proportion of sedentary

behaviors among the population (HHS, Healthy People 2020, 2011). Specific objectives related to achieving this goal rely on current physical activity guidelines for aerobic physical activity and for muscle-strengthening activity. These guidelines include 150 minutes of moderate-intensity cardio exercise per week, strength training for each major muscle group two or three days each week, and flexibility and neuromotor exercises two or three times per week (American College of Sports Medicine, 2013). The combination of physical activity and public health draw from various specializations. These areas of specialization include epidemiology, exercise and sports science, behavioral science, environmental health science, and many others (Kohl, Craig, Lambert, Inoue, Alkandari, Leetoning, & Kahlmeier, 2012). Physical activity has multiple health benefits, including decreases in all-cause mortality, total cardiovascular disease, obesity, Type 2 diabetes mellitus, colon cancer, and osteoporosis (Kesaniemi, Danforth, Kopelman, Lefebvre, & Reeder, 2001). Physical activity also improves mental health and psychological well-being, muscle and bone strength, daily functioning, and the likelihood of living longer (CDC, 2011).

Strength Training

Strength training is defined as a method of improving muscular strength by progressively increasing the ability to resist force through the use of free weights, machines, or the person's own body weight (Medical Dictionary, 2009). Strength exercises are intended to force increasingly greater resistance which, in turn, stimulates development of muscle strength to meet the additional demand (Medical Dictionary, 2009). Strength training can result in multiple health benefits including a reduction in

diabetes, obesity, osteoporosis, arthritis, back pain, and depression (CDC, 2011). Evidence suggests this activity also increases bone mineral density, improves sleep, builds healthy heart tissue, and slows down the aging process (CDC, 2011). Strength training can be easier to tolerate (Purcell, 1997) and a faster way to burn fat when compared to aerobic exercise alone (Beni, 2012). In addition, strength training could have similar positive cardiovascular benefits as noted for aerobic training (Wise & Patrick, 2011). For women, strength training could be especially appealing due to the fact that these activities improve overall physical appearance and body image (Henry, Anshel, & Michael 2006).

Despite the multiple health benefits of strength training, a relatively small proportion of adults in the United States engage in this activity. According the Healthy People 2020 baselines, only 21.0% of adults performed muscle-strengthening activities on 2 or more days of the week in 2008 (HHS, Healthy People 2020, 2011). Unfortunately, the research investigating reasons behind the low participation in muscle-strengthening activities is somewhat limited. In order to more fully comprehend the reasons for poor participation rates in strength training among women, it is important to understand their perceptions, knowledge base, and skill levels regarding this activity.

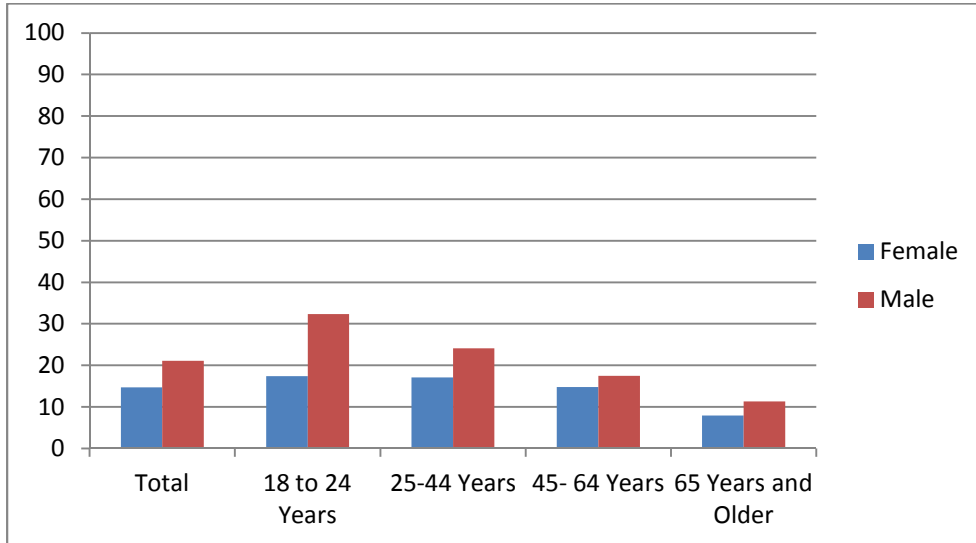
Significance of the Problem

Physical inactivity is the fourth leading cause of death worldwide (Kohl et al., 2012). Moreover, physical inactivity may be responsible for approximately 21.0 to 25.0% of breast and colon cancer cases, 27.0% of diabetes cases, and 30.0% of ischemic heart disease cases (WHO, 2013). In the United States (U.S.), only 15.8% of American women

met the recommended amount of physical activity in the period of 2007 to 2009 (Figure 1) (HHS, 2008). In addition, women residing in rural areas were found to be less physically active and reported having more personal barriers when compared to urban women (Atkinson, Billing, Desmond, Gold & Tournas-Hardt, 2007).

The primary goal of physical activity is to increase longevity and quality of life, and to prevent negative health outcomes (CDC, 2011). As mentioned previously, it is recommended by American College of Sports Medicine (ACSM) that adults should get at least 150 minutes of moderate-intensity exercise per week. Further, the ACSM recommends that adults should train each major muscle group two or three days each week, as well as perform flexibility and neuromotor exercises two or three times per week (ACSM, 2013). As reported in Healthy People 2020, national targets for physical activity and strength training have been established. According to these targets, 47.9% of adults should engage in aerobic physical activity of at least moderate intensity for at least 150 minutes/week, or 75 minutes/week of vigorous intensity, or an equivalent combination (HHS, Healthy People 2020, 2011). In addition, Healthy People 2020 seeks to increase the percentage of adults who perform muscle-strengthening activities on 2 or more days of the week from 21.9% to 24.1%.

Figure 1: Physical Activity Level of Adults Aged 18 and Older Engaging in Adequate* Physical Activity by age and Sex, 2007-2009



*Adequate physical activity is defined as 2.5 hours per week of moderate-intensity activity or 1.25 hours per week of vigorous-intensity activity, or any equivalent combination of both, plus muscle-strengthening activities on 2 or more days per week.

Source: Center for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2007-2009. Analysis conducted by the Maternal and child Health Information resources Center.

Purpose of the Study

The purpose of this concurrent transformative mixed method study was to further explore the determinants of physical activity in rural women ages 20-44 years. Among the target group (rural women ages 20-44 years), quantitative research questions addressed the relationship between the determinants of physical activity on intra- and interpersonal levels, as well as the current physical activity status of participants. For the qualitative portion of the study, strength training was the focus of this research. Specifically, in-depth interviews were used to identify the perceptions, knowledge, motivation, and skills regarding strength training, in order to obtain comprehensive information on strength training patterns among the target group.

A series of questions were developed for both the quantitative and qualitative portions of this research. The following research questions were addressed by quantitative measures:

- 1) What is the physical activity level of rural women ages 20-44 years?
- 2) What is the relationship between background determinants (perceived health status, employment status, number of children and age of children, marital status, and history of sports participation) and physical activity levels of rural women ages 20-44 years?
- 3) What is the relationship between social factors (spousal, family, and friend's support) and physical activity levels of rural women ages 20-44 years?
- 4) What is the relationship between intrapersonal factors (motivation) and physical activity levels of rural women ages 20-44 years?
- 5) What is the relationship between background determinants (history of sport participation) and intrapersonal factors (intrinsic motivation)?
- 6) What is the nature of differences, if any, between physical activity patterns of rural women ages 20-31 years and rural women ages 32-44 years?

The following research question was addressed by qualitative measures:

- 1) What is the difference between young, rural women who do and who do not adhere to ACSM physical activity guidelines regarding strength training?
 - a. What are the physical activity levels?
 - b. What is the history of sports participation?

- c. What is the knowledge of rural women ages 20-44 years regarding strength training?
- d. What is the skill level of rural women ages 20-44 years regarding strength training?
- e. What are the perceptions of rural women ages 20-44 years regarding strength training?
- f. What is the motivation of rural women ages 20-44 years regarding strength training?

CHAPTER II

REVIEW OF THE LITERATURE

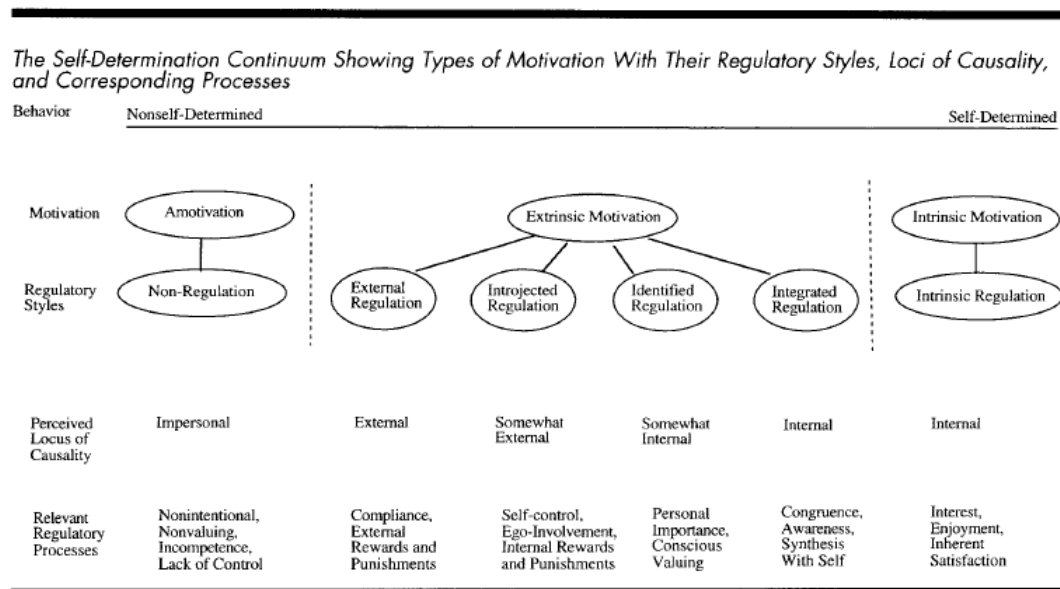
This chapter provides critical evaluation of the literature search that is focused on the determinants of physical activity in women. The topics covered in this chapter include the theoretical framework that was utilized in this study, the assessment of physical activity, interventions to increase physical activity level, social relationships, demographic characteristics, marital status and support, parenthood, perceived health status, perceived benefits and barriers to physical activity, built environment and physical activity, history of sports participation, and perceptions and strength training.

Self-Determination Theory

Due to technological advances, modern culture tends to actively embrace a sedentary lifestyle. Because people spend so much time in front of their computers, TV's, and video games, it is only natural that physical activity levels are reduced. However, sedentary behavior is not a natural tendency for humans. As a result of this predisposition, populations, particularly in the U.S., are experiencing the negative effects of reduced physical activity including poor physical and mental health outcomes. In order to solve the problem of physical inactivity, understanding the motivation for physical activity is crucial (Ryan, Williams, Patrick, and Deci, 2009). Self-Determination Theory (SDT) is one of the most commonly used theories in the field of physical activity (Figure 2). Because this theory focuses on motivation and behavior that is internalized within a social context, SDT can be utilized more fully to understand the relationship between motivation and physical activity level. For the purposes of this study, SDT will be used

to investigate the relationship between motivation formed within a social framework and physical activity level among a cohort of rural women ages 20-44 years in Georgia.

Figure 2. The Self-Determination Continuum



Adapted from “Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being”, by Ryan, R. M., & Deci, E. L., 2000, *American Psychologist*, 55(1), 68

According to Ryan and Deci (2000), the field of psychology progressed significantly in understanding social behavior and its causation. SDT aims to take into consideration not only the activity of the human nature, but also the tendencies for passivity (Ryan & Deci, 2000). The focus of SDT is to unravel the underlying social factors of previously described concepts and to explain the formation of intrinsic motivation. Autonomy, competence, and relatedness are central concepts of intrinsic motivation. Individuals who are intrinsically motivated are also more likely to motivate others and facilitate social changes to promote behaviors (Ryan & Deci, 2000).

As mentioned above, the highest form of motivation comes from a personal experience of three psychological needs: autonomy, competence, and relatedness (Ryan et al., 2009). Autonomy is based on the highest level of consideration and a full sense of choice in the individual. Competence is characterized as a personal belief that one can produce an anticipated result, and relatedness is focused on a reciprocal relationship between an individual and others. This concept has an underlying social context that can either positively or negatively affect the behavior of an individual (Ryan et al., 2009). The concepts of autonomy, competence, and relatedness are significant due to the fact that they are associated with the positive outcomes, increase daily well-being as a function, better mood state, and motivation (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000).

The construct of motivation is essential to the proposed study, but it is important to stress that motivation is not a one-dimensional concept. There are various degrees of motivation that have different effects on human behavior. Intrinsic motivation is a naturally obtained tendency that is essential for human development. However, the development of intrinsic motivation requires supportive conditions from the outside (Ryan & Deci, 2000). For instance, supportive social and environmental factors may help to form intrinsic motivation to engage in physical activities.

Ryan and Deci (1985) developed the SDT as a macro theory of motivation and emotions within a social framework. However, SDT has evolved over the last forty years and numerous constructs have been added. In fact, five mini-theories have been developed within SDT over the years. These mini-theories will be further discussed in the narrative that follows.

The “Cognitive Evaluation Theory” (CET) was the first mini-theory developed within the SDT framework to explain intrinsic motivation. CET is especially helpful in explaining how social factors such as rewards or ego affect intrinsic motivation. CET is mostly based on competence and autonomy to identify the outcome of external events on motivation, and studies have suggested that competence on its own does not increase intrinsic motivation. Rather, competence was supplemented by a sense of autonomy (Ryan et al., 2009).

Extrinsic motivation is another concept that is introduced by the SDT. The opposite of intrinsic motivation, extrinsic motivation is not based on personal satisfaction and can vary in terms of autonomy. Extrinsic motivation is based on instrumentality, which means the function of serving some purpose. For instance, a person who is engaged in the behavior to please parents will be extrinsically motivated, and a person who is performing a behavior for career growth will be intrinsically motivated (Ryan & Deci, 2000). Extrinsic motivation is also a very important concept when attempting to understand physical activity. Unlike intrinsic motivation, which is viewed more as a unified concept, extrinsic motivation is a very complex category of motivation (Ryan et al., 2009). The “Organismic Integration Theory” (OIT), originally introduced by Deci and Ryan (1985), is the second mini-theory developed within the SDT context. The purpose of the OIT was to explain extrinsic motivation in its various forms. It purports that there are different types of instrumentality including external regulation (behaving to gain some reward); introjected regulation (behaving out of the sense of guilt); identified regulation (behaving because of the importance one ascribes to the behavior); and integrated regulation (behavior consistent with other goals) (Ryan et al., 2009).

Figure 2 illustrates various components of the SDT continuum. The first concept” is amotivation. The reasons for amotivation are complex. The inability to engage in the behavior, also known as competence, and lack of knowledge and skills are often cited as reasons to explain one’s motivation (Ryan et al, 2009). According to Ryan et al. (2009), all intentional acts are motivated intrinsically or extrinsically. However, as it relates to physical activity, it is not uncommon for people to lack motivation and have no intention of engaging in the activity. Conversely, integrated regulation is the concept within the SDT that helps to motivate a person to exercise. It is the closest type of regulation to intrinsic motivation and it is characterized by awareness, congruency, and synthesis with self (Ryan & Deci, 2000).

Besides the CET and the OIT, Ryan and Deci (2000) introduced 3 additional mini-theories within the SDT context. These mini-theories are known as “Causality Orientations Theory” (COT), Basic Psychological Needs Theory” (BPNT), and “Goal Contents Theory” (GCT). COT focuses on individual differences in peoples’ propensities to adjust to the environment and regulate behavior. It describes and assesses three types of causality orientation: the autonomy orientation in which person acts out of interest in occurrence; the control orientation in which the focus is on reward; and the amotivated orientation that is based on anxiety concerning competence. The BPNT is based on the concept of psychological needs and their relations to health. Within the BNPT, autonomy, competency, and relatedness are the main predictors of well-being. This theory argues that all three needs are essential and, if any of these needs are dissatisfied, a negative impact on the formation of motivation will result. The GCT distinguishes between extrinsic and intrinsic goals and the impact of these goals on health. For

instance, extrinsic goals may be represented in terms of finances and fame, and intrinsic goals are concepts such as personal growth and relationships. According to the SDT, intrinsic goals have bigger impact on personal well-being (Deci & Ryan, 2000).

SDT and Physical Activity

The concepts based on the SDT framework have been utilized in multiple studies to analyze physical activity patterns (Ryan, & Deci, 2000). Stephan, Boiche, and Le Scanff (2010) examined the motivation determinants of older women's dropout and participation in physical activity. The results indicated that women who were physically active had higher levels of intrinsic motivation and identified regulation; however, external motivation did not differ between two groups. In addition, higher levels of physical activity were associated with high levels of satisfaction, the anticipation that the activity would help to reach important goals, and feelings of guilt. Another study supported the relationship between the SDT concepts such as autonomy, relatedness, competence, and high perceptions of convenience to places for exercise as reported by Gay, Saunders, and Dowda (2011).

The Exercise Self-Regulation Questionnaire (SRQ-E) based on SDT constructs was developed by Ryan and Connell (1989) to measure the motivation for physical activity. This questionnaire is organized so that provided responses represent external regulation, introjected regulation, identified regulation, and intrinsic motivation. The basic idea is to identify the degree to which one feels autonomous with respect to exercising or engaging in physical activity. Despite the potential of the SRQ-E instrument to measure motivational issues, little research has focused on testing the validity of the

instrument. Several studies have been conducted to estimate the reliability and validity of the SRQ-E, but the results of these studies have not been published. Therefore, future research is necessary in order to establish the validity of the SRQ-E instrument (Self-Determination Theory [SDT], 2013).

The Assessment of Physical Activity

Physical activity is crucial in maintaining an ideal health status. Some of the benefits of physical activity include weight control, as well as reducing the risk for many diseases including cardiovascular disease, diabetes, metabolic syndrome, and cancer. Physical activity is also helpful in strengthening bones and muscles, improving mental health status and improving overall daily functioning (CDC, 2011). The assessment of physical activity level is essential in understanding its influence on positive health status. However, properly measuring physical activity level in the general population is difficult to accomplish (Matsudo, 1996). In order to obtain complete information on physical activity level, it is ideal to record all types of daily physical activities. Complete records should always account for levels of intensity, frequency, type, and time. Unfortunately, this is not possible to achieve this level of detail under many circumstances.

Physical activity is a comprehensive term defined as any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above a basal level (CDC, 2011). The term exercise describes a subcategory of physical activity that is planned, structured, repetitive, and purposive in the sense that the improvement or maintenance of one or more components of physical fitness is the objective (CDC, 2011). In order to measure the physical activity level correctly, it is important to consider all

types of physical activity including occupational and lifestyle activities. Occupational physical activity includes all the physical activities that are performed regularly as a part of a job, and lifestyle activities are defined as activities that a person carries out in the course of daily life (CDC, 2011). According to ACSM, it is recommended that adults get at least 150 minutes of moderate intensity exercise per week. This activity can be met through 30-60 minutes of moderate-intensity exercise (five days per week) or 20-60 minutes of vigorous-intensity exercise (three days per week) (ACSM, 2013). In addition, ACSM recommends that adults should train each major muscle group two or three days each week, and they should perform flexibility and neuromotor exercise at least twice or three times per week (ACSM, 2013).

ACSM guidelines on exercise are based on the FITT principle. FITT is an acronym meaning “Frequency”, “Intensity”, “Type”, and “Time” of physical activity. In the FITT principle, “Frequency” describes how often a person performs the targeted health-related physical activity, while “Intensity” is how hard a person exercises during a physical activity period. The term “Type” refers to the specific physical activity chosen to improve a component of health-related fitness, and “Time” is the length of the physical activity (American Alliance for Health, Physical Education, Recreation and Dance, 1999). All components of the FITT principle should be considered when measuring physical activity.

In order to identify physical activity level correctly, it is also important to consider all types of energy expenditure, ACSM guidelines, and the FITT principle. However, measures that have been used in previous studies are inconsistent and incomplete (Ham & Ainsworth, 2010). Ham and Ainsworth (2010) investigated

differences in disparities on physical activity from national accelerometry data and Healthy People 2010 self-report data. Their findings concluded that physical activity surveillance relying on self-report to assess physical activity level was not accurate (Ham & Ainsworth, 2010). This is an important fact because the use of multiple equipment, anthropometric estimates, or coding schemes to assess physical activity level is often impractical. Therefore, more attention should focus on how to appropriately and accurately measure self-reported physical activity level. This would include, but not be limited to, obtaining and modifying measures of physical activity that would accurately reflect the physical activity level of adults in accordance with current ACSM guidelines.

Interventions to Increase Physical Activity Level

The role of community-based intervention is a significant factor necessary to increase physical activity levels among the people in the U.S. ((Kahn, Ramsey, Brownson, Health, Howze, Powell, Stone, Rajab, & Corso, 2002). As a result of this fact, there have been multiple attempts to implement public health interventions that aim to increase the level of physical activity among residents of this country. Kahn et al. (2002) conducted a systematic review to analyze the effectiveness of interventions designed to increase physical activity in programs implemented prior to 2002. Their results indicated that 11 interventions relying on family-based social support had inconsistent findings. However, the interventions relying on a “buddy” system (i.e., social support) and individually-adapted health behavior change strategies demonstrated effectiveness in increasing level of physical activity (Kahn et al., 2002). The researchers acknowledged that more research is needed to fully understand how family-based social support affects physical activity

level. It is important to recognize that various social systems might not have the same level of effectiveness or sources of general support. Peterson, Anthony, Yates, Bernice and Hertzog, (2008) conducted a study that examined the effect of social support on physical activity level in middle-aged women (35 to 65 years old). The results indicated that spouses and friends were the primary source of belonging and esteem support for physical activity among these women. Specifically, friends, group leaders, spouses, and coworkers were the main sources of appraisal and tangible aid support to encourage physical activity (Peterson et al., 2008).

Hartman, Hosper, and Stronks, (2010) reviewed a series of physical activity interventions that focused on mothers with young children (aged 0-5 years). This review spanned publications ranging from 1997 to 2009. The results indicated that interventions that considered the lifestyle of women with children achieved the most success in promoting physical activities. In addition, multi-level interventions including components such as increasing the knowledge level about physical activity and providing opportunities to exercise were the most effective in increasing physical activity level in this cohort (Hartman et al., 2010). This study did not explain if the age of the mother or number of the children had any effect on the results of the interventions.

Social Relationships

According to the SDT, social relationships play a significant role in the formation of physical activity behavior. Multiple studies support this idea by providing evidence for the positive relationship between social support and physical activity level (Eyler et al., 2002; Shelton, McNeill, Puleo, Wolin, Emmons, & Bennett, 2011; Wilcox, Bopp,

Oberrecht, Kammermann, & McElmurray, 2003). Research suggests that women ages 20 through 65 years who possess active living behaviors had higher social support for exercise when compared to sedentary women (Sternefeld, Ainsworth, Quensenberry, 1999). In addition, a review of the literature, published by Gletsu and Tovin (2010), provided strong evidence for the importance of social support in promoting physical activity among African American women. Moreover, Sanderson, Foushee, Bittner, Stalker, and Pulley (2003) reported that among African-American rural women ages 20 to 50, social support was also positively associated with higher physical activity levels.

Demographic Characteristics

Education and SES

Socio-economic status (SES) and educational background are consistently used as the determinants of physical activity. Higher SES has been linked to higher levels of physical activity and intentions to exercise in all genders and ages (Murray, Rodgers, & Fraser, 2012). Moreover, multiple studies have indicated the positive relationship between SES, education, and physical activity level among women of all ethnicities (Brownson, Eyler, King, Brown, Shyu, & Sallis, 2000; Duelberg, 1992; Fleury & Lee, 2006; Jones, Ainsworth, Croft, Macera, Lloyd & Yusuf, 1998). However, several studies were not consistent with these results and did not find a significant relationship between education and physical activity level among women (Felton, Parsons, & Bartoces, 1997; King, Castro, Wilcox, Eyler, Sallis, & Brownson, 2000; Ransdell & Wells, 1998). In addition, Grzywacz and Marks (2001) found that a higher household income was associated with more vigorous exercise in women, yet those women with more education

had a sharper decline in exercise across adulthood. It is important to note that these contradictory findings may be the result of the inconsistent measures of SES (Grzywacz & Marks, 2001). Based on the previous findings, it is evident researchers should strive to measure not only the effect of income precisely but also the level of education in order to understand its influence on physical activity among young rural women.

Employment Status

A review of the literature suggests that the relationship between the employment status and physical activity level was inconsistent. According to King et al. (2000), there was no relationship found between physical activity and employment status. However, when studying the amount of hours spent at work, Nomaguchi and Bianchi (2004) found a negative association between long hours of employment and physical activity level. Sternfeld, Cauley, Harlow, Liu, and Lee, (2000) also found that Black, White, and Hispanic women who were unemployed were less likely to be physically active. Duration, as measured in hours, may have to be considered when studying the effect of employment on physical activity level in rural women ages 20 to 44 years.

Marital Status and Support

Social support can originate from many sources including coworkers, friends, parents, spouses, or children. Research suggests that it is vital to consider marital status when studying physical activity level. Unfortunately, studies that have accounted for marital status, in particular on spousal support, have been contradictory. As reported by Hull et al. (2010), marital status was not a significant predictor of physical activity for

men and women. Another study identified a changing pattern of physical activity behavior across a ten-year period (King, Kiernan, Ahn, & Wilcox, 1998). Specifically, results indicate a decline in physical activity in the pre-marriage period, followed by a relative increase in physical activity after marriage. Whereas the findings of the previously mentioned study may be the result of the stressful situation that was created by marriage, the significant effect of marriage on physical activity behavior was not clear.

Several studies also reported negative relationships between marriage and physical activity level in women. According to Nomaguchi and Bianchi (2004), marriage was related to women spending less time exercising in groups ranging in age from 18 to 56 years. Other research suggests that married women were less likely to be active throughout their life-time compared to their single counterparts (Janzen & Cousins, 1995). The reported physical inactivity levels of their spouses may explain this trend. The authors of this study recommended examining the effect of marriage more precisely in order to understand influences on physical activity at different life stages (Janzen & Cousins, 1995). Other research suggests that married women under the age of 25 years were found to have a lower physical activity level when compared to other women of the same age (Plotnikoff, Mayhew, Birkett, Loucaides, & Fodor, 2004). However, a possible explanation for this trend was not provided.

Brown, Heesch, and Miller, (2009) reported that the 3-year changes in physical activity among women ages 20 to 44 years were negatively associated with marriage, but the association between physical activity and marriage was positive for the middle-aged women. In other words, marriage may not have a static effect on physical activity levels, so the age at the time of marriage may also be important when studying the physical

activity levels among. When studying rural women in Korea, the authors found that marriage was negatively associated with physical activity level (Kim et al., 2008). Therefore, it is important to account for the cultural differences when studying this association.

While several studies indicated a negative association, there is research suggesting a positive association between marriage and physical activity levels in women, and several studies reported a strong association between marriage and high physical activity levels among women (Chipperfield, Newall, Chuchmach, Swift, & Haynes, 2008; Wilcox et al., 2003). Other studies have broadened the context of marriage when examining associations to include not only the effect of marriage on physical activity level, but also the importance of spousal support as a strong predictor of physical activity (Miller, Trost, & Brown, 2002; Peterson et al., 2008).

Marriage can be considered a stressful life event. Such significant events may negatively or positively affect the physical activity levels of women. In addition, it has been suggested that the activities of married women may be influenced considerably by their spouses (Berge, MacLehose, Eisnberg, Laska, & Neumark-Sztainer, 2012; Janzen & Cousins, 1995). Consequently, length of the marriage and spousal support for physical activities need to be considered when studying its effect on physical activity levels among women.

Parenthood

According to a review of the research, the presence of children appears to have a strong negative effect on the physical activity levels among women (Ball, Crawford, & Warren,

2003; Brown et al., 2009; Hull et al., 2010). In addition, parents who experienced a decrease in physical activity after having a child are less likely to restore their physical activity to previous levels (Brown, & Trost, 2003; Hull et al., 2010). Qualitative research, guided by the PRECEDE-PROCEED framework, sought to identify the factors that promote or prevent mothers with young children to be physically active. The results suggested adopting interventions using a “whole family” approach in order to increase physical activity among mothers with young children (Jones, Burns, Howat, Jancey, McManus, & Carter, 2010).

Moreover, it is hypothesized that the number of children may have an effect on physical activity levels. However, the exact associations are unclear. Some studies reported that additional children decrease these levels even further due to added responsibilities (Hull et al., 2010; Larouche et al., 2012). In contrast, other research did not observe such a relationship between the number of children and physical activity. The only factor noted to influence physical activity levels among women was having children under the age of 5 years (Nomaguchi & Bianchi, 2004). Additional research investigating the relationship between number of children and the effect on physical activity is necessary.

Perceived Health Status

Physical health is an important determinant of physical activity among women. Research is consistent in indicating that women who perceived their health as either “excellent” or as “very good” are more physically active when compared to women who perceived their health as “poor” or “fair” (Conn, 1998; Fleury & Lee, 2006; King &

Castro, 2000). In studies that focused on Hispanic and American Indian women, perceived health status also had a positive influence on physical activity behavior (Fisher et al., 1999; Kustr & Fong, 1993). The role of Body Mass Index (BMI) as a predictor of physical activity has also been reported. When studying the effect of BMI in Black or White women on physical activity level, no relationship was found between these variables (Ebrahim, & Rowland, 1996; Ransdell & Wells, 1998; Reinli, Will, Thompson, Liburd, Anderson, 1996; Scharff et al., 1999). Based on the current research, perceived physical health may be a better predictor for physical activity level when compared to either health status or BMI.

Perceived Benefits and Barriers to Physical Activity

Perceived benefits and barriers to physical activity are important to consider when designing a physical activity intervention. The study by Wanda (2002) found that two primary reasons for inactivity were lack of time and one's dissatisfaction with weight or appearance, but the only variable to predict physical activity was self-efficacy. Self-efficacy was also found to be a strong predictor of physical activity among working mothers (Dombrowski, 2011). Kowal and Fortier (2007) investigated factors that influence physical activity in middle-aged and older women and concluded that daily activities and fatigue were the most prevalent barriers. The study that investigated barriers to physical activity in a population-based sample of Australian adults found that perception of being overweight is most often reported as a barrier to exercise, specifically, among women (Ball, Crawford, & Owen, 2000). Similar findings were reported by another study that investigated barriers to physical activity among adults in

the US (Atlantis, Barnes, & Ball, 2008). Another study that focused on rural adults in the Midwest found that low self-efficacy, lack of time, and lack of awareness about benefits of physical activity were the most prominent barriers to moderate physical activity (Tai-Seale, 2003). Lack of time was also reported as significant barrier to physical activity (Bowles, Morrow, James, Leonard, Hawkins, & Couzelis, 2002). However, the investigators speculated that lack of time could result from lack of self-motivation, the only significant barrier to physical activity in this study (Bowles, et.al, 2002). In conclusion, research suggests that the perception of being overweight, lack of time and self-motivation, fatigue, and lack of self-efficacy are some of the important barriers to physical activity in adults (Atlantis et al., 2008; Ball et al., 2000; Bowles et al., 2002; Dombowski, 2011; Tai-Seale, 2003; Wanda, 2002)

Built Environment and Physical Activity

Research suggests that it is important to consider the influence of the built environment on physical activity levels, and several studies have examined this relationship. Some of the identified environmental barriers to physical activity were limited recreational, commercial, and institutional lands (Oliver, Schuurman, Hall, & Hayers, 2011). Moreover, the inability to walk in neighborhoods, as well as excess exposure to air pollution was additional barriers that contributed to low physical activity levels (Hankey, Marshall, & Brauer, 2012). Factors such as a higher residential density, land use mix, street connectivity, aesthetics, and safety were associated with higher physical activity levels and corresponding reduction in the prevalence of obesity (Saelens, Sallis, Black, & Chen, 2003). In addition, when obese individuals perceived

their environment as favorable for physical activity they were more likely to translate their perception of control into action (Godin, Amireault, Gravel, Vohl, & Perusse, 2009). The results of the study that investigated the physical activity behavior change in middle-aged and older women indicated that certain environmental characteristics such as aesthetics and observing others exercising in their neighborhood were associated with higher levels of physical activity (Kowal & Fortier, 2007). Also, when examining the relationship between built environmental and physical activity from the SDT perspective, a strong association was found between strong perception of convenience to exercise, three psychological needs (autonomy, competence, and relatedness) and high physical activity level (Gay, et. al, 2011). In conclusion, the literature suggest that there is a strong association between the built environment and physical activity levels (Gay et al., 2011; Godin et al., 2009; Hankey et al., 2012; Kowal & Fortier, 2007; Oliver et al., 2011; Saelens et al., 2003).

History of Sports Participation

There is a lack of literature that investigates the relationship between the history of sports participation and current physical activity levels in women. However, several studies have attempted to investigate the relationship between history of sport participation and obesity, as well as other health related behaviors in women. The results indicated that a girl's participation in sports may provide the foundation for future health status and health behaviors in adults (Alfano, Klesges, Murray, Beech, & McClanahan, 2002). Research also suggests that participation in sports early in high school appears to have a significant impact on the continuation in sport and physical activity among

females (Phillips & Young, 2009). Aarnio et al. (2002) concluded that among Finnish youth, the girls who participated in organized sports were more often persistent exercisers and persistently fit compared to those who did not engage in these activities. In addition, the researchers recommended participating in different types of sports to promote long-term maintenance of leisure-time physical activity (Aarnio, Winterr, Peltonen, Kujala, & Kaprio, 2002). Even though the study by Pfeiffer et al. (2006) did not examine the long-term consequences of organized sports participation, it highlighted the positive influence of sport participation on vigorous physical activity in a prospective cohort of adolescents. Additional studies also investigated continuity and change in sporting and leisure time physical activities during adolescence. Data from this research supported the idea that involvement in sporting activities and high levels of fitness in mid-adolescence may prevent significant reduction in physical activity later in life (Dovey, Reeder, & Chalmers, 1998). Other than the involvement in organized sports, social factors such as support for physical activity from family members and friends may also contribute to sustained levels of physical activity later in life (Dovey et al., 1998). While the literature suggests the important of early sport participation as a foundation for sustained physical activity later in life, further research is necessary to understand the possible associations, particularly among rural populations.

Perceptions and Strength Training

There is a scarce of literature that focuses on knowledge, skills, and perception of strength training in women, and only few studies have attempted to investigate this topic. One study sought to investigate the benefits and barriers to strength training in college

women. Regardless of whether participants were involved in strength training or not, all women were aware of the benefits of this activity, and they considered health and body image as the main benefits of strength training. However, women who did not participate in strength training perceived more barriers when compared to women who were strength trainers. The main barrier to strength training among non-strength trainers was the time-effort factor (Harne & Bixby, 2005). This finding is consistent with previous findings which suggest that individuals who are inactive and do not intend to participate in physical activities perceive more time-effort barriers (Bowles et al. 2002).

Ratamess et al. (2008) reported that 16.0% of the women who were involved in strength training with the assistance of a personal trainer and 38.0% of the women who did not utilize a personal trainer believed that resistance training could lead to large, “bulky” muscles. While the researchers acknowledged that the perception among women of developing “bulky” muscles from strength training has been around for many years, there are no scientific data to support it (Ratamess, Faigenbaum, Hoffman, & Kang, 2008). In addition, one may speculate that a higher proportion of women not involved in strength training would have such a perception.

CHAPTER III

METHODS

This chapter explains the researchers' quantitative and qualitative strategies to better understand the determinants of physical activity in rural women ages 20-44 years. Topics covered include sampling framework, descriptive analysis of the target area, quantitative design and approach, quantitative instrumentation, survey distribution, and quantitative data analysis. This chapter also covers qualitative design and approach, recruitment of subjects for in- depth interviews, qualitative instrumentation, and qualitative data analysis.

To answer the research questions outlined in the previous section, this research employed a concurrent transformative mixed methods approach, relying on quantitative and qualitative methodologies. Concurrent transformative mixed methods procedures were chosen to combine quantitative and qualitative data in order to provide a comprehensive inquiry of the research problems. This type of an approach embraces the notion that the qualitative methods are embedded within a quantitative design. The concurrent transformative approach is guided by the SDT perspective as well as the concurrent collection of both quantitative and qualitative data. The mixing of these data (quantitative and qualitative) will be interpreted and discussed later (Creswell, 2009, p.222).

Sampling Framework

The sampling framework for both the quantitative and qualitative portions was designed to capitalize on an existing community-based network initialized in a previous grant effort between Georgia Southern University and the Georgia Department of Community Health, Office of Rural Health Services. The overarching purpose of this previous grant was to provide technical assistance to 18 nonprofit rural hospitals in completing the Community Health Needs Assessment (CHNA) as mandated by the Affordable Healthcare Act. The project was organized around a multi-step process that included forming a community advisory committee in each county. Composed of 15-25 members representing a cross-section of the community, the advisory committee was formed to ensure traditionally underserved and minority populations were represented. In addition, formation of these committees sought diversity with respect to race, ethnicity, social, economic, and educational backgrounds. Whereas these committees were advisory in nature, members of this team were also responsible for facilitating the data collection phase (survey) of the project. This phase included aspects of quantitative (survey) and qualitative (focus groups) research. The community advisory committee was also instrumental in the prioritization of issues that emerged from the data collection phase. In order to maximize the likelihood of success, this project relied on a systematic, methodical, and sustained process of communication among all participating communities. As a result, trust was established and a genuine partnership emerged between Georgia Southern University and the community. This framework serves as the basis from which all subjects for this dissertation, both the quantitative and qualitative

data collection, were sampled. The general approach for tapping this network to complete the research for this dissertation is described below.

Key members of previously formed community advisory committees representing the 18 rural counties were initially contacted by email and asked to provide assistance for the proposed project. Members from four of the counties (Clinch, Jeff Davis, Toombs, and Pulaski counties) responded within one week agreeing to assist with this initiative. The representatives were then contacted by telephone to further confirm their willingness to participate in the project, and to provide more detailed information about the recruitment of subjects. Specific tasks conveyed during this telephone call were as follows:

- 1) To identify and approach others serving on the community advisory committee who would be willing to distribute paper copies of the survey in the community.
- 2) To provide the number of possible groups, or clusters, in each community where surveys could possibly be distributed.
- 3) To estimate the number of people in each group, or cluster, that could be potentially surveyed.
- 4) To collect paper copies of completed surveys and make arrangements to send them back to Georgia Southern University.
- 5) To provide contact information of 8 to 15 women between ages of 20 to 44 who may be willing to participate in in-depth telephone interviews.

Tasks 1 through 4 relate to the quantitative portion of the research among rural women. To estimate a cluster sample size for a cross-sectional survey, three estimates were obtained: the number of sites; the number of possible clusters in each community; and the number of people that could be potentially surveyed within each cluster. A total of 11 clusters were identified for all four counties (Table III). Among the four clusters identified in Clinch County, a total of 63 persons to be surveyed were estimated. In Jeff Davis County, a total of 90 persons to be surveyed were estimated among the four clusters. Only two clusters were identified in Pulaski County, but sample size estimates indicated the need to recruit 100 persons to be surveyed. Lastly, only one cluster was identified in Toombs County and sample size estimates indicated the need to recruit 25 persons to be surveyed. Therefore, the calculated sample size for this research was to recruit 278 persons to be surveyed for the quantitative portion of this research design (Table I). Across all four counties (11 clusters), estimates were based on 95% confidence intervals within plus or minus 10%.

TABLE I

Sample Size

Site	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Total
Site 1: Clinch County	10	16	15	22	63
Site 2: Jeff Davis County	20	20	20	30	90
Site 3: Pulaski County	30	70	X	X	100
Site 4: Toombs	25	X	X	X	25

County					
Total	85	106	35	52	278

Additionally, the approach outlined in tasks 1 through 4 was an attempt to ensure some level of randomness in the survey collection phase. Task 5 relates to the qualitative portion of the proposed research, and will be discussed in context later. A descriptive analysis of the proposed target areas (counties), as well as the specific methodology of the quantitative and qualitative approaches, are detailed below.

Descriptive Analysis of the Target Area (Counties)

The target population of the proposed study was volunteer women, ages 20 to 44 years, living in four rural counties in Georgia. As mentioned above, the sampling framework strategy from a previous Georgia Southern initiative was used to recruit and sample study participants. The target counties of Clinch, Jeff Davis, Toombs, and Pulaski relative to Georgia Southern University are illustrated in Figure 3. Exclusion criteria for the proposed study included being non-English speaking, male, and females younger than 20 years old or older than 44 years old.

According to the U.S. Census Bureau (2013), the estimated population of Clinch County in 2012 was 6,718 persons. Approximately 69.0% of the population is White, followed by Black residents (27.9%). Women comprise 50.7% of the county population and median household incomes (\$33,143) are considerably lower than the median state income (\$49,347). According to recent reports, 27.9% of the population lies below the

federal poverty level as compared to the state average of 16.5% (U.S. Census Bureau, 2012). Overall, the health status of Clinch County is ranked 151 out of the 159 counties in Georgia (County Health Rankings, 2012). In addition, county health rankings suggest that the number for premature death (12,215) and rates for uninsured (22.0%), and unemployment (11.5%) are higher than the recorded state average.

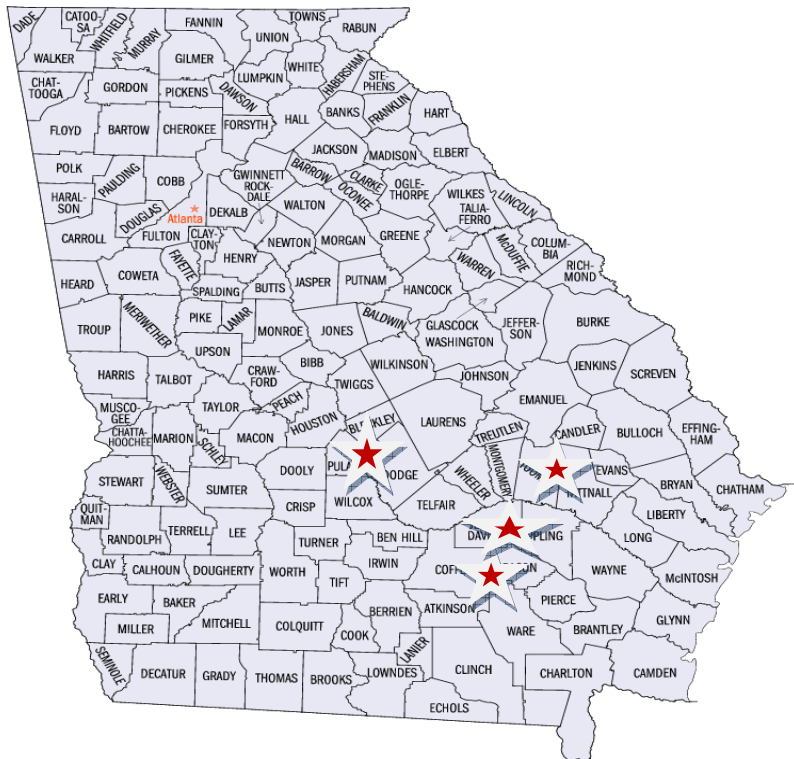
The population of Jeff Davis County was estimated to be 15,156 persons according to the U.S. Census Bureau (2013). White residents comprise 82.6% of the overall population, while Black residents represent a much smaller proportion (15.2%). Slightly more women reside in Jeff Davis County (50.5%) and residents have a lower median household income (\$35,336) as compared to the state (\$49,347). Moreover, 23.7% of the population is reported to be below the federal poverty level. According to national health rankings, the health status of Jeff Davis ranks 136 out of the 159 counties in Georgia (County Health Rankings, 2012). Jeff Davis also reports poorer outcomes in terms of premature death (11,168), uninsured populations (25.0%), and unemployment (14.3%) as compared to the state.

According to the U.S. Census Bureau (2013), the estimated population in Toombs County was 27,315 persons in 2012. Over 97.0% of the population is either White (71.7%) or Black (25.4%) residents. Women comprise 52.6% of the county population, and the median household income (\$32,462) is lower than the median household income for the state. The population health status of county residents is ranked 75 out of the 159 Georgia counties (County Health Rankings, 2012). Toombs County also reports poorer outcomes in terms of premature death (9,274) and uninsured populations (24.0%).

However, the reported rate of unemployment is considerably higher than other rural counties (11.4%).

According to the U.S. Census Bureau (2013), the estimated population of Pulaski County in 2012 was 11,720 persons. Approximately 66.2% of the population is white, followed by black residents (31.3%). Women comprise 57.0% of the county population and median household incomes (\$32,424) are considerably lower than the median state income (\$49,347). According to recent reports, 13.2% of the population is below the federal poverty level as compared to the state average of 16.5% (U.S. Census Bureau, 2012). Overall, the health status of Pulaski County is considerably better than other target counties and is ranked 47 out of the 159 counties in Georgia (County Health Rankings, 2012). In addition, county health rankings suggest that the numbers for premature death (8,190), and rates for uninsured (21.0%), and unemployment (10.0%) are similar to the recorded state average.

Figure 3. Graphic Representation of Target Communities



Design and Approach

The quantitative part of this research utilized a survey to provide a description of the determinants of physical activity in rural women ages 20 to 44 years by studying a sample from the population described above. The survey was constructed using five separate questionnaires identified in the literature that seek to measure background determinants, history of sports participation, current physical activity level, interpersonal determinants, and intrapersonal determinants. Relevant sections from these surveys were combined to address all content areas related to the research questions. Specifically, the research questions addressed by quantitative measures include the following:

- 1) What is the physical activity level of rural women ages 20-44 years?

- 2) What is the relationship between background determinants (perceived health status, employment status, number of children and age of children, marital status, and history of sports participation) and physical activity level of rural women ages 20-44 years?
- 3) What is the relationship between social factors (spousal, family, and friend's support) and physical activity level of rural women ages 20-44 years?
- 4) What is the relationship between intrapersonal factors (motivation) and physical activity level of rural women ages 20-44 years?
- 5) What is the relationship between background determinants (history of sport participation) and intrapersonal factors (intrinsic motivation) of rural women ages 20-44 years?
- 6) How are physical activity patterns of rural women ages 20-31 years different from rural women ages 32-44 years?

Instrumentation

In order to establish reliability of the survey, Cronbach's alpha was calculated. Cronbach's alpha based on standardized 40 items used in this study was .852. The survey consisted of sections from five separate questionnaires identified in the literature. These questionnaires were specifically used to measure background determinants (Demographic Questionnaire), history of sports participation (Life Long Physical Activity Questionnaire), current physical activity level (Modified Physical Activity Questionnaire), interpersonal determinants (Social Support for Physical Activity Scale), and intrapersonal determinants (Exercise Self-Regulation Questionnaire) (Gabriel,

McClain, Lee, Swan, Alvar, Mitros, & Ainsworth, 2009; O'Brien Cousins, 1995; personal communication, 2013) . Once compiled, this new questionnaire was modified to fit the anticipated needs of the proposed research. While at least some of the questionnaires used to create this new survey were validated in the literature, it is important to initiate an individualized process of ensuring some level of face and content validity for this new instrument. The approach to ensuring a basic degree of validity has been multi-step in nature. First, the newly created questionnaire was thoroughly reviewed by the Dissertation Chair and the members of the Dissertation Committee. Secondly, the questionnaire was pre-tested with a small number of faculty and students in the Jiann-Ping Hsu College of Public Health to determine if the survey appears to measure all the constructs in the current study. Lastly, the newly created survey was pilot tested by the investigator of the study with approximately 20 Georgia Southern University School of Nursing students who resemble the characteristics of the population of interest. At the end of each stage of the process, modifications and revisions suggested by all audiences that review the survey were integrated.

A summary of the determinants, indicators, and measures assessed by the finalized questionnaire are illustrated in Table 1. These content areas are discussed in the next section. A copy of the final questionnaire can be found in Appendix A. A more thorough description of each survey section is described in more detail below.

Background Determinants

In order to select the appropriate target for analysis, screening questions were utilized to identify inclusion/exclusion criteria for this study. The first three questions of

the survey inquire about each participant's gender, race, and age. Additional questions included on the instrument are designed to assess other demographic characteristics including employment, marital status, living arrangement, education, income, number and age of children, and perceived health status. The questions from this section were instrumental in answering the following Research Question # 2: "What is the relationship between background determinants (perceived health status, employment status, number of children and age of children, marital status, and history of sports participation) and physical activity level of rural women ages 20-44 years?".

This section of the questionnaire was specifically created by the primary investigator and has not been gleaned from previously published surveys.

History of Sports Participation

Questions related to the individual history of sports participation among the target was designed by the primary investigator of this research project and were not gleaned from previously published surveys. This section of the questionnaire seeks to assess the history of sports participation in elementary school, middle school, high school, and college. This section of the survey is essential for answering the following Research Question # 2: What is the relationship between background determinants (perceived health status, employment status, number of children and age of children, marital status, and history of sports participation) and physical activity level of rural women ages 20-44 years?". History of sports participation among rural women ages 20 to 44 years was measured within three categories characterized as "Low", "Medium", or "High." Participants characterized in the "Low" category represented women with no previous history of sports participation during elementary school, middle school, high school, or college. Participants characterized in the "Medium" category represented women

reporting some history of sports participation in elementary school, middle school, high school, or college. Lastly, the “High” category level represented women involved in organized sports throughout their education.

Current Physical Activity Level

Questions related to current levels of physical activity were adopted from a study published by Gabriel, McClain, Lee, Swan, Alvar, Mitros, & Ainsworth (2009). This particular research utilized a Physical Activity Questionnaire (PAQ) to measure physical activity level in middle-aged women. The results indicated that PAQ test-retest reliability coefficient ranged from 0.74 to 0.91. Specifically, questions in this section were used to measure a woman’s current physical activity level, including items associated with home activities, work activities, and recreation activities.

This modified PAQ aimed to answer following Research Question # 1: “What is the physical activity level of rural women ages 20-44 years?” Moreover, this modified PAQ intended to accurately identify physical activity level the target group by considering a broad range of activities related to physical activity.

Physical activity scores among rural women ages 20 to 44 years were measured within three categories characterized as “High”, “Moderate”, or “Low.” The “High” physical activity score category corresponded to women who fully adhere to ACSM guidelines. These guidelines include the following: 30 to 60 minutes of moderate-intensity exercise (five days per week) or 20 to 60 minutes of vigorous-intensity exercise (three days per week); training of each major muscle group two or three days each week; and flexibility and neuromotor exercise at least two or three times per week. Women

categorized as a “Moderate” physical activity score were those who adhered to the following criteria: 3 or more days of vigorous activity of at least 20 minutes per day; or 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day; or 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities. Women who did not meet the criteria for either the “Moderate” or “High” category were assigned to the “Low” physical activity category.

Interpersonal Determinants

Questions related to interpersonal determinants were adopted from the Social Support for Physical Activity Scale. Based on the published literature, this scale has high test-retest reliability at 0.79 (O'Brien Cousins, 1995). It consisted of four Likert-type items with choices ranging from “Strongly Agree” to “Strongly Disagree.” The scale is designed to assess the social support for physical activity from family, friends, and physicians. The lower the person scored on the scale, the higher level of support she received from her social circle.

Social Support for the Physical Activity Scale was utilized in order to answer the following Research Question# 3: “What is the relationship between social factors (spousal, family, and friend’s support) and physical activity level of rural women ages 20-44 years?” The individual correlation analysis for each type of social support and physical activity level was completed.

Intrapersonal Determinants

Questions related to intrapersonal determinants were adopted from the Exercise Self-Regulation Questionnaire (SRQ-E) that was obtained through personal communication with scholar of SDT, Edward Deci, through an SDT web site, he provided the information about SRQ-E via email (personal communication, 2013). This section of the questionnaire was utilized in this study to assess the motivation level for regular exercise or physical activity among rural women ages 20 to 44 years. The specific purpose of this section was to assess the external regulation, introjected regulation, identified regulation, and intrinsic motivation for participating in physical activities. The different motives have been found to be related to different health outcomes (Ryan et al., 1997). Despite the potential of the SRQ-E instrument to measure motivational issues, little research has focused on testing the validity of the instrument. Several studies have been conducted to estimate the reliability and validity of SRQ-E, but these results have not been published.

SRQ-E was utilized in order to answer the following Research Questions # 4 and 5: "What is the relationship between intrapersonal factors (motivation) and physical activity level of rural women ages 20-44 years?" and "What is the relationship between background determinants (history of sport participation) and intrapersonal factors (intrinsic motivation) of rural women ages 20-44 years?"

To score this questionnaire, the subscale scores for each of the four items (external regulation, introjected regulation, identified regulation, and intrinsic motivation) are calculated. Specifically, the responses were averaged to each of the subscale's items. Described below are the item numbers associated with each of the four

subscales. External regulation was measured by questions 5, 7, and 12. Introjected Regulation was assessed by questions 3, 6, 9. Questions 2, 8, and 10 represented Identified regulation. Finally, Intrinsic Motivation was measured by questions 1, 4 and 11 (“Motivation for Working out” section in Appendix A “Physical Activity Questionnaire”).

TABLE II

Determinant, Indicators, and Measures

	Indicators	Measures
Background Determinants	<ol style="list-style-type: none"> 1. Demographics: age, sex, race, SES, marriage status, number and age of children, perceived health status 2. History of organized sports participation 3. Current physical activity status 	<ol style="list-style-type: none"> 1. Demographic Questionnaire 2. Life-Long Physical Activity Questionnaire 3. Physical Activity Questionnaire (PAQ)
Intrapersonal Determinants	Motivation	Exercise Self-Regulation Questionnaire (SRQ-E)
Interpersonal Determinants	Social support from the spouse, family, and friends	Social Support for Physical Activity Scale

Survey Distribution

After approval by the Dissertation Committee and the Institutional Review Board (IRB), the questionnaire was finalized and pre-tested and pilot tested in the manner described previously. Following necessary revisions, a final version of the questionnaire was developed (Appendix A). Copies of the paper-based questionnaire were provided by the investigator to community representatives via mail. Respective versions of the questionnaire were distributed to constituents in the community based on the clusters, previously identified by community representatives.

Survey collection began during the third week of December 2013 and continued through the end of February 2014. The distribution of paper-based questionnaires was left to the discretion of the community representatives. However, each representative using paper questionnaires were asked to hand deliver the instruments to each group or cluster. Further, they were instructed to suggest a reasonable time frame for completion, preferably before the end of February 2014. The completed surveys from each community were mailed to the primary researcher at Georgia Southern University. Weekly contact via telephone and email was maintained between the primary researcher and community representatives throughout the data collection period.

Data Analysis

All paper-based questionnaires were considered anonymous data because identifying information was not collected. Data from these questionnaires was directly keyed into SAS for Windows 7.0. Data from electronic questionnaires was directly imported into a SAS spreadsheet. The data were cleaned by using a frequency table for

each variable to identify “missing data”, and the histogram with the normal distribution curve overlaid was used to identify if any variables had been entered incorrectly. In addition, the following analyses were performed to address the research questions:

- 1) Simple descriptive statistics were generated in order to describe the survey participants. Data were presented on background determinants (demographics, history of sports participation, social determinants, health status, and physical activity level), interpersonal (social support), and intrapersonal factors (motivation).
- 2) The scoring protocol of the PAQ instrument was utilized to answer following Research Question # 1: “What are the physical activity levels of rural women ages 20-44 years?”
- 3) A correlation analyses of background determinants, inter and intrapersonal determinants were created. Pearson product correlations analyzed relationships between background determinants and physical activity behavior. This measure, defined as “ r ,” indicated how well data points fit a statistical model. The range of “ r ” was from 0 to 1 or -1. If the number was positive, that would indicate a positive linear correlation between variables. If the number was negative, that would indicate negative linear correlation between variables. The closer the “ r ” approaches 1, the stronger the relationship. If “ r ” is equal to 1, that would indicate a perfect correlation. However, in social or behavioral studies, a correlation of $r = 0.3$ or 0.4 may be interpreted as either a “strong” or “very strong” correlation due to the difficulty of finding a single factor that is

correlated with a given behavior. Correlation analyses were used to answer following research questions:

- a. What is the relationship between background and physical activity level of rural women ages 20-44 years?

Null hypothesis:

There is no relationship between history of sports participation and physical activity level.

- b. What is the relationship between background determinants (history of sport participation) and intrapersonal factors (intrinsic motivation)?

Null hypothesis:

There is no relationship between history of sport participation and intrinsic motivation.

- c. What is the relationship between social factors and physical activity level of rural women ages 20-44 years?

Null hypothesis:

There is no relationship between social support and physical activity level.

- d. What is the relationship between intrapersonal factors and physical activity level of rural women ages 20-44 years?

Null hypothesis:

There is no relationship between intrinsic motivation and high physical activity level.

4) Post-stratification was performed to answer following research question:

What is the nature of differences, if any, between physical activity patterns of rural women ages 20-31 years and rural women ages 32-44 years?

Qualitative

Design and Approach

The qualitative portion of this study was designed to understand the knowledge level, skills, perceptions, and types of motivation possessed by rural women ages 20 to 44 years about strength training. This qualitative process involved inductive reasoning working from particular findings to general themes and then making interpretations about these themes. To answer qualitative questions of the study, a purposeful intensity sampling technique was utilized to identify participants. Intensity sampling was chosen in order to obtain information-rich cases that evident the phenomenon of standard interest concentration (Patton, 2002, p. 234). This method was used to fully comprehend the difference between rural women aged 20 to 44 years in motivation, skills, and education level regarding strength training. The participants were interviewed until theoretical saturation was reached. Among the target group (rural women ages 20 – 44 years), the qualitative research question and sub-questions included the following:

- 1) What is the difference between young, rural women who do and who do not adhere to ACSM physical activity guidelines regarding strength training?
 - a. What is the knowledge of rural women ages 20-44 years regarding strength training?
 - b. What is the skill level of rural women ages 20-44 years regarding strength training?
 - c. What are the perceptions of rural women ages 20-44 years regarding strength training?
 - d. What is the motivation of rural women ages 20-44 years regarding strength training?

Recruitment of Subjects

The participants for this portion of the research were recruited through community representatives in the four target counties (Clinch, Jeff Davis, Toombs, and Pulaski Counties). The recruitment of the participants occurred in one of two ways. The first method was for community representatives to solicit 8 to 15 women that met the inclusion criteria for age and gender to participate in in-depth interviews. Secondly, the question was included in the survey that asks for participants' willingness to take part in in-depth interviews. This particular question also solicited their contact information at the end of the survey. Women who agreed to participate were contacted via telephone. This method allowed selection of the participants based on their various activity levels. Participant recruitment began shortly after the research was approved by the Dissertation

Committee and the Georgia Southern University IRB. Recruitment was initiated as early as the third week of December 2013 and data collection was completed by the end of February 2014.

For those participants identified by community representatives, names and basic contact information including email address, and telephone number of each participant who agree to participate was provided. The researcher recommended that approximately half of participants solicited for participation were chosen based on their full adherence to ACSM guidelines in regards to physical activity, which are comprised of at least 150 minutes of moderate-intensity exercise per week, strength training two or three days each week, and flexibility and neuromotor exercise twice or three times per week. It was recommended that the other half of participants solicited did not participate in physical activities. It was recognized that considerable variation in health facilities vary with each community, so the number of participants from each group were not expected to be equal. However, qualitative comparison of attitudes and perception of strength training were confined to rural women with no intent to compare county level variation.

The researcher contacted each individuals identified by the community representative in order to confirm their willingness to participate in the study. For those subjects expressing an interest to participate following survey completion, the research contacted those individuals independently based on the contact information completed on the survey. All in-depth interviews were conducted over the telephone. On average, in-depth interviews lasted approximately 30-40 minutes.

Instrumentation

Qualitative research leads to different kinds of knowledge when compared to quantitative research. Therefore, credibility or internal consistency is taken into consideration instead of internal validity (Morrow, 2005). The transferability (vs. external validity) of this research was established by the extensive description of the context, participants, and process. The dependability (vs. reliability) of the study relied on the consistency of the process recreation by future researcher (Morrow, 2005).

A semi-structured question guide was utilized for in-depth interviews to obtain qualitative information, and all interviews were conducted by telephone. This method was used due to unfeasibility of the investigators to travel to all the designated sites. The interview guide was based on the SDT and research queries. The guide was developed by the researcher in order to obtain in-depth information on skill level, knowledge, perceptions, and types of motivation in young rural women in the four target counties in regards to strength training. More formally defined, strength training is a type of physical exercise specializing in the use of resistance to encourage muscular contraction which builds the strength, anaerobic endurance, and size of skeletal muscles (Mosby's Medical Dictionary, 8th edition, 2009).

After approval by the Dissertation Committee and the Georgia Southern University IRB, the questions were pre-tested with five Georgia Southern University School of Nursing students who resembled the population of interest. Based on the results of the pre-test, the final version of a semi-structured question guide was finalized. The following questions are included in the Appendix B and Table III.

TABLE III

Research Sub-Questions and Interview Questions

Research Sub Questions	Interview Questions
What is the knowledge rural women ages 20-44 years obtain regarding strength training?	<ol style="list-style-type: none">1) What is strength training? (Probe: Provide some example of strength training exercise)2) What role does strength training play in women's health?3) Can you think of any undesirable things that might happen as a result of strength training?4) If a friend came to you for an advice regarding working out, would you recommend strength training? Why? Why not? If yes, name some of the exercises that you would suggest to your friend.
What is the skill level of rural women ages 20-44 years regarding strength training?	<ol style="list-style-type: none">1) Tell me about your exercise routine that involves the use of body weight, free weights, or any other type of resistance. (Probe: What are some exercises that involve the use of resistance that you perform? Do you use body weight, free weights or machines?)
What are the perceptions of rural women ages 20-44 years regarding strength training?	<ol style="list-style-type: none">1) What are some things that come to mind when I say "strength training"? (Probe: think about some positive and negative sides of strength training)2) What do you think of when you see woman strength training

<p>What is the motivation of rural women ages 20-44 years possess regarding strength training? (Self-Determination Theory)</p>	<ol style="list-style-type: none"> 1) How do you think strength training would affect (or affects) your fitness (the condition of being physically fit and healthy)? 2) How do you think strength training would affect (or affects) your appearance? 3) How difficult or easy it is to perform strength training? 4) Tell me about your friends or family involvement in strength training? (Probe: how people in your social circle view strength training?) 5) How does it make you feel to be engaged in strength training? (Probe: do you enjoy strength training?)
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Data Analysis

For the qualitative data examination, thematic analysis was performed. The in-depth interviews were recorded with a digital voice recorder. All data were divided into two groups: (a) women who fully adhere to ACSM guidelines, and (b) women who do not adhere to ACSM guidelines. Initially, in each group, there were total of four categories including skill level of young rural women regarding strength training, knowledge of young rural women regarding strength training, perceptions of young rural women regarding strength training, and types of motivation in young rural women

regarding strength training. In each category, major themes were identified and analyzed. The analysis of the data involved discovering themes in the interview transcripts and attempting to verify and confirm these themes by searching through the data, repeating the process, and identifying other themes and categories. In order to complete this task, all the interviews were transcribed verbatim and coded by using the qualitative software QSR NVivo 10. The researcher first read each transcript and made notes (words and phrases). In the second stage, the researcher aggregated all of the words and phrases from all the interviews on the separate sheet of paper. Once this shorter list of categories was created, the researcher looked for overlapping or similar categories. Informed by a theoretical perspective (SDT) developed during the research, these categories were further refined by the investigators and reduced in number by grouping them together. Finally, all the data were placed onto Microsoft Word document. It is from this file that the report of the findings was written.

Ethical Considerations

Institutional Review Board (IRB) review at Georgia Southern University at Statesboro, GA was obtained. All questionnaires, whether hard copy or electronic, contained a cover page with narrative disclosing the purpose of this research, appropriate principle investigator contact information, benefits of participation and risks of participation. Informed consent was ensured by completing the survey and by the interaction between participants and the survey administrators who confirmed that the information was fully disclosed and that participants fully understood the risks. Participants taking part in-depth interviews were given their informed consent via

telephone after the researchers explained the study and ensured confidentiality. Informed consent disclosed the same information as was disclosed on the first page of the questionnaire (purpose, contact information, benefits, and risks). Upon receipt of the informed consent via telephone, interviews were scheduled. Prior to conducting the telephone interview, participants were again read a narrative describing purpose of the study as well as any risks associated with this research. Regardless of participation in either the quantitative or qualitative portion of this research, it was made clear to subjects that participation is voluntary and that they may withdraw at any time.

CHAPTER IV

RESULTS

This chapter presents the findings from the quantitative and qualitative data gathered by the researchers to better understand the determinants of physical activity in rural women ages 20-44 years. The topics covered in quantitative results' section include background determinants, history of sports participation, physical activity scores, social support responses, intrapersonal determinants of physical activity behavior, background determinants and physical activity behavior, intrapersonal determinants and background determinants, intrapersonal determinants and physical activity behavior, and interpersonal determinants and physical activity behavior. The topics covered in qualitative results' section include demographic characteristics of the participants, physical activity level, history of sports participation, and strength training.

Quantitative Results

This section illustrates results of the cross-sectional survey of physical activity behaviors and determinants of rural women ages 20 to 44 years old. At the end of the data collection period, 184 women from four rural counties in Georgia participated in this survey. Based on sample size estimates, this equates to a 66.2% response rate. For this analysis, the four target counties were classified as four strata. Among these strata, eleven clusters were identified. The calculated sum of weights was 737.32 persons (Table IV). The narrative that follows presents the descriptive statistics for the background determinants of physical activity and physical activity behavior. In addition, this section illustrates participant's history of sports participation, physical activity scores, social support responses, and intrapersonal determinants of physical activity. The last section presents the correlation of physical activity categories, background determinants, intrapersonal determinants, and interpersonal determinants.

TABLE IV:

Data Summary

Data Summary	
Number of Strata	4
Number of Clusters	11
Number of Observations	184
Sum of Weights	737.32

Background Determinants

Demographic Characteristics

The age characteristics of the study participants are illustrated in Table IV. As indicated previously, 184 women participated in this study. Frequencies not totaling 184 indicate missing data associated with a particular item. According to these data, the majority of the participants (34.2%) were 40 to 44 years old, followed by women 35 to 39 years old (17.4%) and 30 to 34 years old (17.4%). Women between the ages of 25 and 29 comprised 14.7% of the sample, and participants between the ages of 20 and 24 comprised 8.7% of the sample (TABLE V).

TABLE V

Distribution by Age Categories 1 Among Study Participants

Age Categories	N	%
20-24	16	8.7
25-29	27	14.7
30-34	32	17.4
35-39	32	17.4
40-44	63	34.2
Frequency Missing	14	7.6
Total	184	100.0

The participants of the study were also dichotomized to address Research Question 6. These categories were defined as participants ages 20 to 31 years and

participants 32 to 44 years. Women between the ages of 32 and 44 years old comprised the majority of the sample (65.1%) (Table VI).

TABLE VI

Distribution by Age Categories 2 among Study Participants

Age Categories	N	%
20-31	59	34.9
32-44	122	65.1
Frequency Missing	3	1.6
Total	184	100.0

Participants were predominately White (82.9%) whereas African American women comprised only 12.2% of the sample. The percentage of Hispanics (4.2%), Asian/Pacific Islanders (0.5%), and other races (0.3%) represented in the sample was very low (Table VII).

TABLE VII

Distribution by Race among Study Participants

Race	N	%
White, Non- Hispanic	152	82.9
Black/ African- American, Non- Hispanic	20	12.2
Hispanic/ Latino	5	4.2

Asian/ Pacific Islander	1	0.5
Other	1	0.3
Frequency Missing	5	2.7
Total	184	100.0

The majority of women reported being either married or living with someone (60.8%) whereas 21.3% of participants reported being single. Only 0.5% of participants reported being married but separated and 1.7% of participants report living together only. Approximately 13.5% of women indicated they were divorced, and 1.8% reported being widowed. Marital status in the other category was reported by 0.5% of participants (Table VIII).

TABLE VIII

Distribution by Marital Status among Study Participants

Marital Status	N	%
Single	35	21.3
Married/ Living Together	115	60.8
Married, Separated	1	0.5
Not Married/ Living Together	5	1.7
Divorced	21	13.5
Widowed	4	1.8
Other	1	0.5
Frequency Missing	2	1.1
Total	184	100.0

Among those participating in this study, 75.8% of women reported having children (Table IX). Among this group, most (66.4%) reported having two to three children. Approximately 27.3% of participants reported having only one child while 4.1% indicated they have four or more children (Table X). Only 2.2% of participants reported having no children.

TABLE IX

Reported Parenthood

Children	N	%
Yes	139	75.8
No	45	24.2
Total	184	100

TABLE X

Reported Number of Children

Number of Children	N	%
0	4	2.2
1	33	27.3
2 to 3	91	66.4
4 or more	7	4.1
Frequency Missing	49	26.6

Total	184	100.0
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Of those women who had children, the majority of women reported to have children between ages four to 18 years old (56.7%), followed by women who had children older than 18 years old (34.2%) (Table XI).

TABLE XI

Reported Age of Children

Age of Children	N	%
0 to 3 Years Old	12	9.1
4 to 18 Years Old	62	56.7
18 or More Years Old	44	34.2
Frequency Missing	66	35.9
Total	184	100.0

Table XII reports the level of education of women participating in this study. As indicated, 20.9% of participants reported having only a high school education or General Education Development (GED) certificate, whereas only 0.5% of participants reported less than a high school education. Nearly 25.0% of women reported having some college education, and 34.9% of participants had either a Bachelor's degree (20.8%) or Graduate degree (14.1%). Technical School training was reported by 15.9% of participants.

TABLE XII

Distribution by Education Level among Study Participants

Level of Education Completed	N	%
Less than high School	1	0.5
High School or GED	34	20.9
Some College	42	24.6
Bachelor's Degree	39	20.8
Graduate Degree	31	14.1
Technical School	27	15.9
Other	7	3.2
Frequency Missing	3	1.6
Total	184	100.0

Approximately 11.9% of participants reported household incomes of less than \$25,000 per year. Household incomes of \$25,000 to \$49,999 (24.1%), \$50,000 to \$74,999 (27.4%), and \$75,000 to \$99,000 (13.6%) were reported for approximately 65.1% of the study participants. Only 7.2% of women reported annual household incomes of at least \$100,000. Lastly, 10.6% of participants did not wish to disclose household income earnings, and 5.1% indicated they did not know household income levels (Table XIII).

TABLE XIII

Distribution by Household Income Among Study Participants

Household Income (Per Year)	N	%
Less than \$25,000	22	11.9
\$25,000 to \$49,999	41	24.1
\$50,000 to \$74,999	49	27.4
\$75,000 to \$99,999	21	13.6
\$ 100,000 or More	16	7.2
Will Not Report	24	10.6
Do not Know	9	5.1
Frequency Missing	2	1.1
Total	184	100.0

Over 80.0% of women participating in this study reported being employed full time while 14.2% were part-time employees. Only 5.2% of study participants indicated they were unemployed (Table XIV).

TABLE XIV

Distribution by Employment Status Among Study Participants

Employment Status	N	%
Full-time	145	80.3
Part- time	27	14.5
Unemployed	11	5.2
Frequency Missing	1	0.6
Total	184	100.0

In the demographics section of the survey, perceived health status was also assessed and can be found in Table XV. According to these data, 24.8% of women surveyed perceive their personal health to be “Excellent” and 37.5% perceived their health to be “Very Good”. Approximately 33.0% of women rate their personal health as “Good”, and only 4.6% of participants rate their health as either “Fair” (3.7%) or “Poor” (0.9%).

TABLE XV

Reported Health Status

Health Status	N	%
Excellent	42	24.8
Very Good	72	37.5
Good	58	33.0
Fair	9	3.7
Poor	2	0.9
Frequency Missing	1	0.6
Total	184	100.0

History of Sports Participation

Survey results suggested that the history of sports participation in most women (47.0%) was characterized as “Medium” given that some participation in sports was reported during elementary school, middle school, high school and college years (Table XVI). Approximately 40.9% of women never participated in any kind of organized sports during their school and college years, so these women were categorized as “Low”

participants. Only 12.1% of women reported to consistently participate in organized sports during school and college years.

TABLE XVI

Reported History of Sports Participation

Sports Participation Category	N	%
Low Category [*]	70	40.9
Medium Category ^{**}	90	47.0
High Category ^{***}	24	12.1
Total	184	100.0

^{*} Low Category: No participation in sports in elementary/middle/high schools or college

^{**} Medium Category: Some participation in sports in elementary/middle/high schools or college

^{***} High Category: Active participation in in sports in elementary/middle/high schools or college

Physical Activity Scores

According to the results presented in Table XVII, most women (49.8%) reported moderate level of physical activity. Approximately 37.4% of participants indicated a low physical activity level, and only 12.8 % of women participated in recommended levels of physical activity.

TABLE XVII***Reported Physical Activity Scores***

Physical Activity Category	N	%
Low Category [*]	68	37.4
Moderate Category ^{**}	93	49.8
High Category ^{***}	23	12.8
Total	184	100.0

^{*} Low Category: Individuals who do not meet the criteria for the Medium or High category

^{**} Medium Category: Individuals who meet any one of the following criteria

- 3 or more days of vigorous activity of at least 20 minutes per day OR,
- 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day OR
- 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.

^{***} High Category: Individuals who meet these criteria

- 30-60 minutes of moderate-intensity exercise (five days per week) OR 20-60 minutes of vigorous intensity exercise (three days per week)
- Exercise each major muscle group 2 to 3 days each week
- Perform flexibility and neuromotor exercise at least 2 to 3 times per week

Social Support Responses

On the survey, social support scores ranged from one to five with a score of five representing the highest level of social support for physical activity. A score of one represented no social support for physical activity. The results gleaned from the Social Support section of the survey are presented below in Table XVIII. A majority of the women (59.4%) somewhat agreed (48.1%) or strongly agreed (11.3%) that the people in their social circle are interested in being physically active. Most of the participants

(65.1%) also somewhat agreed (37.2%) or strongly agreed (27.9%) that at least one person in their life encouraged them to participate in physical activities. A majority of the participants (64.7%) somewhat agreed (28.5%) or strongly agreed (36.2%) that their health provider promoted physical activities; however 23.9% of the participants were not sure about their health provider encouragement towards involvement in physical activities. Most of the women (59.7%) somewhat agreed (30.0%) or strongly agreed (29.7%) that their husbands motivated them to be physically active. More than half of the participants (57.3%) somewhat agreed (33.6%) or strongly agreed (23.7%) to have an athletic family and 40.3% of women strongly disagreed (11.6%) or somewhat disagreed (28.7) that their family was not athletic.

TABLE XVIII

Reported Social Support Responses

Social Influences	Strongly Disagree		Somewhat Disagree		Unsure		Somewhat Agree		Strongly Agree	
	N	%	N	%	N	%	N	%	N	%
Social Group Active	13	6.6	35	21.6	28	12.3	83	48.1	22	11.3
One Person Encouraged	20	11.6	22	9.9	28	13.5	70	37.2	42	27.9
Health Provider Encouraged	11	5.2	11	6.3	48	23.9	59	28.5	53	36.2

Husband Encouraged	14	9.6	8	4.3	33	26.3	48	30.0	44	29.7
Family Athletics	19	11.6	54	28.7	5	2.3	62	33.6	41	23.7

Intrapersonal Determinants of Physical Activity Behavior

Intrapersonal determinants of physical activity among rural women ages 20 to 44 years old are represented by four variables: External Regulation, Introjected Regulation, Identified Regulation, and Intrinsic Motivation. On the survey, participants were asked to rate these determinants on a range from one to seven. A score of one represents the lowest level of intrapersonal determinants while a seven represents the highest level of intrapersonal determinants. For instance, if a woman scored the highest on Intrinsic Motivation determinant, it would mean that she is intrinsically motivated to participate in physical activities.

The results from this section of the survey are presented in Table XIX. The results indicate that the highest type of motivation for physical activity among rural women was Identified Regulation with a mean score of 4.70. Identified Regulation is the second highest form of motivation measured in this study after the Intrinsic Motivation, followed by Introjected and External Regulation. The mean scores of Introjected Regulation (3.47), External Regulation (3.46), and Intrinsic Motivation (3.38) were slightly lower (Table XIX).

TABLE XIX***Intrapersonal Determinants of Physical Activity***

Variable	Range	Mean	SD
External Regulation	6.00	3.46	277.41
Introjected Regulation	6.00	3.47	291.89
Identified Regulation	6.00	4.70	431.60
Intrinsic Motivation	6.00	3.38	296.57

Background Determinants and Physical Activity Behavior

The data related to background determinants and physical activity are presented in Table XX. Results indicate that history of sports participation had a significantly strong positive relationship ($r= 0.40$; $p = 0.0005$) with physical activity level in rural women. As the participants' involvement in organized sports increased during school and college years, there was a corresponding increase in physical activity level. In addition, perceived health status had also strong association with higher physical activity levels in rural women ($r= 0.30$; $p = 0.0136$). Those women who reported to perceive their health status as good or excellent also had significantly higher involvement in physical

activities. There was no statistically significantly strong relationship found between age ($r=0.14$; $p = 0.3321$) and physical activity level or between marriage ($r= 0.02$; $p = 0.8537$) and physical activity level among rural women in this study.

TABLE XX

Correlations of Physical Activity Categories and Background Determinants

Determinant or Outcome	<i>r</i> -VALUE	<i>p</i> - VALUE
History of Sports Participation	0.40	0.0005
Age	0.14	0.3321
Marriage	0.02	0.8537
Employment	0.03	0.6993
Perceived Health Status	0.30	0.0136

The analysis of the correlations between additional background determinants (parenthood, number of children, and age of children) and physical activity level are presented in Table XXI. According to these data, neither parenthood ($r= 0.02$; $p = 0.8301$), employment ($r= 0.03$; $p = 0.6993$), or the number of children ($r=0.01$; $p = 0.8944$) demonstrated strong statistical relationships with physical activity level. However, the age of children ($r= 0.21$; $p = 0.0403$) was associated with physical activity levels among rural women.

TABLE XXI

Correlations of Physical Activity and Parenthood

Determinant or Outcome	<i>r</i>- VALUE	<i>p</i> - VALUE
Parenthood	0.02	0.8301
Number of Children	0.01	0.8944
Age of Children	0.21	0.0403

Intrapersonal Determinants and Background Determinants

Pearson's Product Correlations were calculated in order to analyze the relationship between intrapersonal determinants and background determinants. The results of these analyses are presented in the following tables. As indicated in Table XXII, a statistically significantly strong positive relationship between history of sports participation and intrinsic motivation ($r= 0.30$; $p = 0.0013$) was observed. This finding suggests that the higher the reported involvement in organized sports during school and college years, the higher was the intrinsic motivation for physical activity later in life.

TABLE XXII

Correlations of History of Sports Participation and Intrinsic Motivation

Determinant or Outcome	<i>r</i>- VALUE	<i>p</i>-VALUE
Intrinsic Motivation	0.30	0.0013

Intrapersonal Determinants and Physical Activity Behavior

Pearson's Product Correlations analyzed the relationship between intrapersonal determinants and physical activity behavior. As indicated in Table XXIII, statistically

significant relationships were observed at all levels. Specifically, a strong positive relationship was found between identified regulation and physical activity level ($r= 0.48$; $p = 0.0001$). In addition, a strong positive relationship was identified between intrinsic motivation and physical activity level in rural women ($r=0.47$; $p = 0.0002$). The relationship between external regulation ($r=0.31$; $p = 0.0104$) and introjected regulation ($r=0.33$; $p = 0.0013$) was also strong.

TABLE XXIII

Correlations of Physical Activity Categories and Intrapersonal Determinants

Determinant or Outcome	r- VALUE	p - VALUE
External Regulation	0.31	0.0104
Introjected Regulation	0.33	0.0013
Identified Regulation	0.48	0.0001
Intrinsic Motivation	0.47	0.0002

Interpersonal Determinants and Physical Activity Behavior

Pearson’s Product Correlations also were used to assess the relationship between interpersonal determinants and physical activity behavior (see Table XXIV). The results indicate that social support for physical activity may have an influence on physical activity levels of rural women ages 20-44 years. Husband’s support ($r= 0.28$; $p = 0.1379$) had a stronger positive relationship on physical activity level when compared to other

types of social support; however, this relationship was not statistically significant. Correlations among interpersonal determinants and physical activity level also reveal a positive relationship between friends' support for physical activity behavior ($r=0.23$; $p = 0.0035$), and between family athletics ($r= 0.18$; $p = 0.0359$) and physical activity level. Lastly, the relationship between health care provider support for physical activity behavior and physical activity level had the weakest relationship among all the types of social support ($r=0.10$; $p = 0.1075$).

TABLE XXIV

Correlations of Physical Activity Categories and Interpersonal Determinants

Determinant or Outcome	<i>r</i>- VALUE	<i>p</i> - VALUE
Husband's Support	0.28	0.1379
Family Athletics	0.18	0.0359
Friends' Support	0.23	0.0035
Health Care Provider Support	0.10	0.1075

Qualitative

The qualitative analysis and results of in-depth interviews are presented in this section. A total of fifteen women ages 20-44 years from Toombs, Pulaski, Clinch, and Jeff Davis counties were interviewed. Specifically, the interviews explore the

determinants of physical activity behaviors with focus on strength training, and the participants were segmented into two groups: (1) high physical activity level group; and (2) low physical activity level group. The high physical activity level group was distinguished by full adherence to ACSM guidelines with respect to physical activity which comprises of at least in 150 minutes of moderate-intensity exercise per week, strength training two or three days each week, and flexibility and neuromotor exercise two or three times per week; whereas the low physical activity level group did not adhere to ACSM guidelines. These guidelines were discussed in the Introduction “Physical Activity” section of the dissertation.

In the high physical activity level group, a total of six in-depth interviews with rural women ages 20 to 44 years old were conducted. The average age of women in high physical activity level group was 30.2 years old. Four of the six women were White, and two were African American. Four of the six women were married, and two had children. Four of participants in high physical activity level group reported having earned a college degree, and five of participants reported having a full-time job (TABLE XV).

TABLE XXV

Demographic Characteristics

Demographic Variable	High Physical Activity Group (N)	Low Physical Activity Group (N)
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Age		
20-31	4	4
32-44	2	5
Race		
White, Non-Hispanic	4	6
Black/ African-American, Non-Hispanic	2	2
Hispanic	0	1
Marital status		
Single	1	3
Married/living together	4	4
Not married/living together	1	1
Divorced	0	1
Children		
None	4	5
1	0	2
2-3	2	2
Education completed		
High school or GED	1	4
Some college	0	1
College degree	4	4
Doctoral degree	1	
Employment status		
Full-time	5	6
Part-time	0	1
Unemployed	1	2

In the low physical activity level group, nine in-depth interviews were conducted among rural women ages 20 to 44 years old. The average age of women this group was 31.8 years. Six of the nine participants were White, two were African- American women, and one was Hispanic. Four of the nine women were married, three women were single, one woman was living with someone but not married, and one woman was divorced. Five of the nine women did not have children. Among the nine women interviewed from this group, four participants reported earning a high school degree, and five participants had earned either a college degree or had at least some college education. Six women in this group were employed full-time (TABLE XV).

The results of in-depth interviews were divided into three categories: physical activity level, history of sports participation, and strength training. These categories emerged from the literature review and theoretical framework. Multiple themes were identified within each category and the results are presented below:

Physical Activity Level

Theme “Individual Characteristics”: Good health vs. medium health

When asked to describe physical health, all participants in high physical activity group (HPAG) described their physical health as either good or above average. Participants in low physical activity group (LPAG) described their health as either “good” or “medium”. One woman said,

“Um, I do not know, I guess it is not poor but not great either. I can define it maybe a little below average I guess.”(LPAG)

Theme “Lifestyle”: Active lifestyle vs. family responsibilities

Women from high physical activity group talked about having a very active lifestyle. They mentioned doing a lot of housework, being very active at work, walking their dogs, and playing with animals. For instance one woman said when asked about her average day,

“Cleaning the house like on the daily basis...cleaning up, laundry...dishes, vacuum...extremely active at work, also walking a lot from one school to another. A large school is connected...and I have to go there 3 or 4 times a week...20-30 minutes at the time. Um, playing with animals and dogs and horses mainly.”(HPAG)

Women from high physical activity group also mentioned being very physically active with their children. One participant said,

“I constantly do stuff with the kids, we are going to places and doing things...going to the park and playing...um... I don't just sit down...running around and doing things.”(HPAG)

Most women from low physical activity group talked about having a lot of family responsibilities and working long hours. For example, one woman described her average day,

“What makes it difficult is...after I have been at work all day and I am just not motivated to do anything else....once I get home and I want to get in my pajamas and I do not want to leave the house.” (LPAG)

Compared to some women in the high physical activity level group who reported spending their time with children and family being physically active, a few of the participants from the low physical activity level group viewed time spent with their children and family as a barrier to physical activities. For instance, one woman explained,

“I have to get my baby ready and me ready for work and then when you come back home in the afternoons, she wants to play and I want to spend some time with her and then she needs to go to bed and get her ready...you know eating supper and get all that kind of stuff done...so time is the big issue to be physically active.”(LPAG)

Theme “Motivation and Physical Activity”: Intrinsic motivation vs. extrinsic motivation

When asked about the biggest motivation to being physically active, all women in high physical activity level group talked about motivating themselves. A few participants

mentioned the fact that exercising makes them feel good and they have a desire to become better. For example, one woman said,

“I think I have goals, I am always trying to be better...every morning when I wake up and I am sore or tired....I always remember why I am doing this. Like I want to be better, get a better time...things like that.”(HPAG)

Another participant said,

“I would say what makes it easy is that you feel good...like the results and progress that you make...throughout the process...it keeps me going.”(HPAG)

Women in the low physical activity group talked about lack of motivation. Some women mentioned the fact that they need to be motivated by someone else such as a friend or a husband. One person said,

“What makes it difficult is the motivation to make myself do it...and it is easier if my husband is going to do it...that motivates me to do it....but if nobody motivates me, I just do not do it.”(LPAG)

History of Sports Participation

Theme “Sports Participation in School”: High involvement in sports during school years vs. low involvement in sports during school years;

Most women in the high physical activity group were involved in organized sports when they were in elementary, middle, and high school. For example, one participant said,

“In high school I actually played basketball and I ran track but I would say growing up with softball was my heart. I played softball since I was like 6 years old...I mean I was really involved in sports.”(HPAG)

Another woman who participated in various sports throughout her childhood and teenage years said,

“You know I feel like I was born to be an athlete.”(HPAG)

Most of the participants in the low physical activity group talked about the fact that they were not involved in organized sports besides participating in physical education classes. For instance, one woman said,

“Um...I did not do any sports or anything like that. I just did regular physical activities at school.”(LPAG)

Theme “Social Influences”: active social circle during childhood vs. parent’s motivation during childhood.

When asked about family and friends' influence on sports' participation, one theme that stood out was the fact that women in the high physical activity group mentioned their friends and family being involved in sports, which motivated them to play sports as well. One woman said,

"I think just like my friends were doing it and it seems fun...um, good way to get outdoors and stuff like that."(HPAG)

Another participant said,

"I watched my cousins who were older than myself...so, I watch them and I tried out and started to do it every year."(HPAG)

A few participants in high physical activity group also mentioned the fact that participation in sports while growing up was enjoyable,

"Um, honestly at that time, there was not any push whatsoever, I just wanted to do it because it was something to do...I just really enjoyed it."(HPAG)

When compared to women in the high physical activity group, women in the low physical activity group had low organized sports' participation while growing up. Many participants mentioned their parents influence when it came to sports participation.

Motivation that comes from outside of the individual is called extrinsic motivation and it

is the opposite of intrinsic motivation. When someone is extrinsically motivated, he/she is less likely to sustain the behavior when compared to people who are intrinsically motivated (Ryan & Deci, 2000). One woman explained why she did not want to participate in sports,

“Oh god, my parents were the typical soccer mom...always in my face about the sports.”(LPAG)

Another woman in the low physical activity group talked about her dad being a barrier to sport participation during her school years. He believed that participation in sports or any other commitments outside of school could result in limited time for academic work,

“but my family, more my dad did not think that I should play sports because I would not focus on my academics so I was not allowed to play sports even though I wanted too.”(LPAG)

Strength Training

Theme “Knowledge of Strength Training”: High knowledge level vs. lack of knowledge

When comparing women in the high physical activity group to women in the low physical activity group, it became apparent that differences in knowledge level existed.

Participants who were engaged in strength training had extensive knowledge of strength training and provided the correct examples of strength training exercises. For instance, one woman explained,

“Ok...like I was saying...pushups, squats...um, and exercises with weights...with the bar...even Pilates...I would consider as strength training...yoga is another variation of strength training.”(HPAG)

Another woman when talking about her strength training routine said,

“I do lunges, I do a lot of bicep curls, I do a lot of shoulder presses. I...what else do I do...I do a lot of squats...um, yesterday what I did...I did shoulder raises I think I said that already ... abs work...the rowing machine, and a box jumps...some mix of that.”(HPAG)

A few participants in the low physical activity group listed exercises that do not necessarily build strength. Other women in the low physical activity group did mention weight lifting; however, most of them could not provide any examples of these activities and they could not name other types of strength training exercises. One woman said,

“I have no idea because I do not know what it means...you need to explain it to me.”(LPAG)

In addition, most of them believed that strength training could only be done at the gym. For example one woman said,

“It is difficult because you would have to do it at the gym and if you do not have equipment, you have to go to the gym.” (LPAG)

Theme “Effects of Strength Training”: Health vs. appearance

When discussing the effects of strength training, the opinions of the two groups varied significantly. Women, who were engaged in strength training, mentioned health as one of the main benefits. For instance, one participant described the role of strength training,

“Big role...it makes you healthier and fit.” (HPAG)

Another participant said,

“It strengthens bones, as well as...women tend to have a weaker upper body...so, that helps....it helps our posture...because we tend to hold more weight in our chest...more than men...and we tend to be hitched more than men...so we really have to strengthen our back...especially upper back for a better posture...and then prevent osteoporosis.....prevent arthritis....those are all the benefits...and besides, you know...getting in a better mood, getting hormones in a normal level...then sleeping and decreasing headaches.”(HPAG)

In contrast, women in the low physical activity group named only physiological changes as a result of strength training. One participant said,

“I do not think it plays as big a role in women's health as it does in men's health just from body appearance I would think.”(LPAG)

Another participant said,

“Um...I do not think strength training...I do not know if it would necessarily improve your health...I think it would just improve the look of your body.” (LPAG)

Theme “Undesirable Outcomes of Strength Training”: Injuries vs. overtraining.

When asked about undesirable effects that strength training may have on a women’s health, women in the high physical activity group mentioned injuries that can occur as a result of improper technique,

“Negative side of it...you know, if you are actually not doing it in a proper way...you can hurt yourself.”(HPAG)

Most women in the low physical activity group also mentioned injuries as an undesirable effect of strength training. However, when compared to women who engage in strength training, women in the low physical activity group did not mention improper technique. Rather, they talked about over training and overdoing,

“Let’s see...um...if you over do...you can hurt something that is what I can think of. If you overdo it...you might hurt your back or something like that.”(LPAG)

Another woman said,

“If they are overdoing it or not eating properly or dehydrated or you know they just put too much weight at one time...so maybe they can hurt themselves.”(LPAG)

Theme “Perceptions about Strength Training”: enjoyment of working out vs. perception of exercise as being difficult to perform

Women in the high physical activity group thought that it was easy to be engaged in strength training. They also perceived strength training as enjoyable and something that makes them feel good. For instance, one woman said

“Um, it makes me feel great. I feel like...at the end of my exercises I kind of feel like I have done something today and it makes me feel...it gives me motivation to keep going.” (HPAG)

Another woman said,

“It actually makes me feel really good that I have accomplished something.”(HPAG)

Several women in the high physical activity group also mentioned improved self-esteem and empowerment and as some of the positive outcomes of strength training,

“They <women> feel more empowered...so, they feel like they can do more, they feel more confident, because they lifted some weights and once they can hold the plank for like 30 seconds, they just feel that confidence, so I think it is really important to incorporate strength training for women.”(HPAG)

Women in the low physically activity group believed that strength training was hard to do when compared to other types of exercises,

“It is probably hard. I do not know, I would say hard...that is why I have never done it, it just seems hard to me.” (LPAG)

Another participant explained,

“I do not know what to do...yeah...besides just do not know what to really do or anything.”(LPAG)

Also, one woman in the low physical activity group felt that there were women’s type of strength exercises and men’s type of strength exercises.

Theme “Strength Training and Appearance”: Feminine look vs. being bulky.

One of the most interesting findings was the difference in perceptions between two groups as it related to the effect of strength training on the physical appearance of women. Even though a few participants in the high physical activity group did mention that they do not want to look too muscular, all women used words such as “toned,” “lean,” “attractive,” and “less fat” to describe how strength training makes them feel. One participant said,

“I think it makes you more attractive.”(HPAG)

Another woman said,

“Well, like I said earlier...it burns...if you do it burns more fat, so I do not wanna say you would lose a lot of weight but it does help to burn more calories and all that...you have more muscle tone.” (HPAG)

Several participants who were the most physically active also used the term “feminine” when describing their engagement in strength training. One woman said,

“I feel more feminine and kind of my appearance...It makes me look more feminine in that way.” (HPAG)

Another woman said,

“Standing next to the guys at the gym and still at the same time...still look feminine. Um...I don’t know it is empowering.”(HPAG)

In contrast, women in the low physical activity group utilized words such as “going for that look,” “overabundance of muscles,” “looking extremely muscular,” “not looking like a woman” to describe possible effects of strength training on physical appearance.

One woman said,

“For myself I do not know...the formed butt is fine with me but too many muscles I do not think so...like your arms and stuff like that...no...I think it makes you look manlier you know.” (LPAG)

Many women in the low physical activity group felt that a little bit of strength training might be a positive thing for a woman’s appearance, but they mostly mentioned the fact that strength training would make a woman look too muscular. One participant said,

“Do not think a whole lot about it unless she is beyond the point that she does not look like a woman.” (LPAG)

In conclusion, when asked about physical appearance and strength training, the issue that was mentioned by most women in the low physical activity group was women who were doing bodybuilding competitions. One woman said,

“Um, me personally I do not care for women that have an overabundance of muscle...um, I guess a lot of professional body trainers...women...I do not particularly care about the look...I like the toned muscles.” (LPAG)

CHAPTER 5

Discussion

This chapter provides explanation of the results by mixing quantitative and qualitative data. Topics covered include physical activity behaviors in rural women, relationships between history of sports participation and physical activity (PA) behavior, background determinants and PA behavior, intrinsic motivation and history of sports participation, intrapersonal determinants and PA behavior, and social support and PA behavior. In addition, this section covers limitations of this research, implications for public health practice, implications for future research, and ethical considerations.

Physical Activity Behaviors in Rural Women, Ages 20 to 44 Years

Physical Activity Level

Due to inconsistencies in self-administered physical activity measures throughout published research, this study specifically focused on attempting to more precisely measure physical activity levels of rural Georgia women, ages 20 to 44 years. The survey (Appendix A) was designed to account for the various types of structural physical activities experienced by rural women, including strength training, flexibility exercise, and neuromotor exercise. The survey was also designed to measure energy expenditure from work, household chores, and a multitude of leisure activities. There are three levels of physical activity proposed: Low, Moderate, and High. The criterion for each level was identified by the “PAQ” or Physical Activity Questionnaire. The High physical activity category is defined as 30 to 60 minutes of moderate-intensity physical activity (five days per week) or 20 to 60 minutes of vigorous-intensity physical activity (three days per week); training of each major muscle group two to three days each week; and flexibility and neuromotor physical activity at least two to three times each week. The Moderate

category included one of the three criteria: 3 or more days of vigorous activity of at least 20 minutes per day; 5 or more days of moderate-intensity physical activity or walking of at least 30 minutes per day; 5 or more days of any combination of walking, moderate-intensity or vigorous intensity physical activities achieving a minimum of at least 600 Metabolic Equivalent of Task (MET)-min/week. The Low category indicated that participants did not meet the criteria for high and moderate categories of physical activity.

The physical activity behaviors of 184 women from four rural counties in Georgia were described in this mixed methods study. Results indicated that only 12.1% of women fully adhered to ACSM guidelines and were placed into high physical activity category. The majority of the participants (49.8%) reported moderate physical activity levels. Approximately 37.4% of participants reported low physical activity levels.

The results of the current study reported lower numbers for women who are engaged in recommended amount of physical activity when compared to previous findings described in the literature. It is reported that from 2007 to 2009, nearly 14.7% of American women participated in the recommended amount of physical activity (US Department of Health and Human Services, 2010). This could be due to incomplete measures of previous studies or due to the fact that the participants in this study were rural women from the South. According to the literature, near 60.2% of rural women from the South were found to be physically inactive, compared to 45.7% of rural women (Wilcox et al., 2000).

Qualitative results gleaned from the current study further explained that women, who had high physical activity levels perceived their lifestyle as very active by doing a

lot of housework, being active at work, being physically active with their children, as well as walking their dogs, and playing with animals. In contrast, women that were living a sedentary lifestyle reported that work and family responsibilities interfered with exercise because no time was available to engage in physical activities. As reported by Bowles et al. (2002), the lack of time was a significant barrier to physical activity. However, the investigators speculated that when lack of time was used as an excuse to not exercise, it could be an indication of amotivation which was the only significant barrier to physical activity in Bowles et al. (2002) study. The concept of amotivation towards physical activity is not uncommon for people to experience. Self-amotivation basically means that person has no intention of engaging in the activity. The reasons for amotivation are complex. The inability to engage in the behavior, also known as competence, and lack of knowledge and skills are often cited as reasons to explain motivation (Ryan et al, 2009).

Strength Training

According the Healthy People 2020 baselines, only 21.0% of adults performed muscle-strengthening activities on 2 or more days of the week in 2008. It has been speculated that proportions of adult women engaging in these muscle strengthening activities are even lower when compared to men, however, the exact numbers are not reported (HHS, Healthy People 2020, 2011). The current study indicates that only 12.1% of rural women in this sample performed the recommended amount of strength training exercises. Unfortunately, the research investigating reasons associated with low participation in muscle-strengthening activities is somewhat limited. In order to fully

comprehend the reasons for poor participation rates in strength training among rural women, qualitative in-depth interviews were used to gauge perception, knowledge, and skill level of strength training activities. Results from qualitative data analysis suggested several factors that could potentially contribute to a low participation in strength training activities in rural women ages 20 to 44 years. The possible factors important in facilitating participation in these activities are described in detail in the following paragraphs.

First off, it is important to note that differences in knowledge level was apparent between women who engaged in strength training activities and those who did not engage in these activities. When asked to name strength training activities, several non-strength training participants listed exercises that do not necessarily build strength. While other women categorized as non-strength training participants did mention weight lifting, most of them could not provide examples of these activities. In fact, these women were unable to name other types of strength training exercises beyond lifting weights. Moreover, most women categorized as not engaging in strength training reported that these activities could only be performed at the gym. In contrast, women who were engaged in strength training indicated extensive knowledge in this area of physical activity. These data suggest that providing a basic education and understanding of strength training may be very important to promote women's participation in this area.

Results from the current study also suggest considerable variation in the opinions of the two groups of rural women when discussing the specific effects of strength training. Women, who were actively engaged in strength training, mentioned the health benefits of performing these activities. This trend was not noted among women from non-

strength training group and participants apparently were unaware of the health benefits offered by these activities. However, they were able to reference physiological changes in the body. These results are partly inconsistent with the literature but it could be due to the differences in study populations. Harne and Bixby (2005) found that college women, who were and who were not engaged in strength training, were aware of the benefits of strength training and considered health and body image as the main benefits of strength training. The results of the current study suggest that lack of knowledge about the importance of strength training in rural women's health may also contribute to low participation in strength training in women. From a public health perspective, women need to be informed about the benefits of strength training. Benefits include improvements in overall health as well as a possible reduction in numerous health problems such as diabetes, obesity, osteoporosis, arthritis, back pain, and depression (CDC, 2011). In addition, it is essential that strategies designed to educate women about the benefits of strength training need to include information concerning resulting increases in bone mineral density (Brown, 2002), improvements in quality of sleep, and the building of healthy heart tissue (CDC, 2011). Lastly, it is documented that adequate strength training slows the aging process (Hunter, 2002) and could have similar positive cardiovascular benefits as noted for aerobic training (Wise & Patrick, 2011).

An additional factor that may result in low strength training participation rates is an overall lack of skill related to these activities. Women who did not perform strength training believed that strength training activities were difficult to perform when compared to other types of physical activities. Participants in this study also mentioned that they did not possess the knowledge to begin the strength training process. On the other hand,

women who did participate in strength training perceived that the initiation of strength training activities was a relatively easy process. This group also perceived strength training as an enjoyable activity that makes them feel good, and improves their self-esteem. It was evident from the data collected in this study that many of the women not engaged in strength training believe such exercises are designed only for men. In other words, members of this group suggested that certain types of physical activity cannot be performed by a woman. This is an incorrect assertion and women can engage in any type of physical activity provided proper technique and weight are employed.

Another possible factor that was identified by in-depth interviews was the effect of strength training on a woman's appearance. Even though women who were engaged in strength training did mention that they had no desire to look too muscular and most in this group used adjectives such as "toned," "lean," "attractive," and "less fat" to describe how strength training makes them feel. The word "feminine" was also mentioned by women who were the most physically active. However, women who did not participate in strength training had different perceptions about the impact of these activities. When describing the possible effects of strength training on physical appearance, women from this cohort often used phrases such as "going for that look," "overabundance of muscles," "looking extremely muscular," and "not looking like a woman." In fact, when asked about physical appearance and strength training, looking like women involved in bodybuilding competitions was one of the first concerns expressed. The results reported in this current study are consistent with the literature. Ratamess et al. (2008) found that 16.0% of the women who were involved in strength training with the assistance of a personal trainer and 38.0% of the women who did not utilize a personal trainer believed

that resistance training could lead to large, “bulky” muscles. The researchers also mentioned that this myth of developing “bulky” muscles from strength training has been reported for many years. However, there is limited scientific data to support the fact that women believe in the myth of developing “bulky” muscles due to strength training (Ratamess, Faigenbaum, Hoffman, & Kang, 2008).

In conclusion, the current study suggest that factors such as the lack of knowledge about strength training, the health benefits of strength training, the lack of skills, and misperceptions about the effect of strength training on a woman’s appearance can possibly explain some of the reasons for low strength training participation among women. Although possible factors have been identified, further research in this area is warranted.

Relationships Between History of Sports Participation and Physical Activity

Behavior

The results of this study indicate that the majority of women (47.0%) had some level of sports participation during the elementary school, middle school, high school and college years, whereas only 12.1% of women consistently participated in organized sports during these years. More than 40.0% of women never participated in any kind of organized sports during their school and college years. Further analysis of quantitative data indicated that sports participation had a statistically significant strong positive relationship with physical activity levels in rural women. As the participants’ involvement in organized sports increased during school and college years, there was an increase in physical activity level later in life. In addition, most women in the high

physical activity group were involved in organized sports throughout elementary school, middle school, high school, and even college. Aside from participating in physical activity classes, most of the participants in low physical activity group were not involved in organized sports.

Even though the research that focuses on the relationships between history of sports participation and physical activity behavior is limited, the result of current study are allied with the speculations of previous studies that focused on short-term effects of sports participation. For instance, Alfano et al. (2002) suggested that girls' participation in sports may provide the foundation for future health status and health behaviors in adults. In addition, Phillips and Young (2009) suggest that participation in sports early in high school appeared to have a significant impact on girls' continuation in sport and physical activity. Dovey et al. (1998) also supported the idea that involvement in sporting activities and high levels of fitness in mid-adolescence may prevent significant reduction in physical activity later in life.

In conclusion, the results of this study suggest that early participation in organized sports is positively correlated with higher physical activity level later in life among rural women. Therefore, public health interventions that focus on promotion of organized sports participation during school years may result in higher physical activity among girls, particularly involvement later in life. However, further research is needed in this area in order to fully understand the dynamics of these relationships.

Relationships Between Background Determinants and Physical Activity Behavior

Age

Participants were segmented into two age categories: 20 to 31 years old and 32 to 44 years old. Women between ages 32 and 44 years old comprised the majority of the sample (65.1%). The current study analyzed the effect of age on physical activity level. However, quantitative results did not find that age had any effect on level of physical activity, defined as either an active or sedentary lifestyle. In addition, a strong relationship between age and physical activity level in rural women was not detected.

These findings seem to be inconsistent with the literature. However, the lack of correlation may be due to the relatively small age range of the participants. Most participants in current study were still working full time and were relatively young, between the ages of 20 and 44 years. It is possible that if the participants were older, the effect of age would be a stronger predictor of physical activity level.

Marriage

It has been suggested that the activities of married women may be influenced considerably by their spouses (Berge et al., 2012; Janzen & Cousins, 1995). Therefore, the current study investigated the relationship between marriage and physical activity level. The study sought to understand if getting married would result in significant increase or decrease of physical activity level among rural women. However, the quantitative results did not indicate a strong relationship between marriage and physical activity level in rural women, and no major themes were identified during thematic analysis.

The results of previously published research appear to be inconsistent. While several studies indicated a negative association between marriage and physical activity

levels in women, some research suggests a positive association between these factors. In fact, several studies reported a strong association between marriage and high physical activity level among women (Chipperfield et al., 2008; Wilcox et al., 2003).

Marriage can be considered a stressful life event. Such significant life events may positively or negatively affect the physical activity level of women. However, further research may need to expand the concept of “marriage” and focus on various types of cohabitation in order to understand its influence on physical activity level of women.

Employment

The results of current research suggest that over 80.0% of women participating in this study reported being employed full time while 14.2% were part-time employees. Only 5.2% of study participants indicated they were unemployed. The quantitative results of this study did not indicate a strong relationship between employment status and physical activity level. According to qualitative research, women from high physical activity group talked about the fact that work and family responsibilities helped them to maintain an active lifestyle, in contrast, women from low physical activity group perceived their work and family responsibility as a barrier to physical activity due to lack of time. These findings are consistent with previous literature. According to Bowles et.al (2002), lack of time was also reported as significant barrier to physical activity. However, the researchers suggested that lack of time could result from lack of self-motivation (Bowles et.al, 2002).

Parenthood

Most women in this study reported having children (75.8%), and more than 66.0% of women had two to three children. The majority of the participants (56.7%) had children between ages four and 18 years. The analysis of the correlations between background determinants and physical activity level did not find a strong statistical relationship between parenthood or the number of children and physical activity level. However, the age of children had an effect on physical activity level in rural women. According to qualitative results, the presence of young children had a contrary impact on sedentary versus active women. Active women viewed the presence of young women as an opportunity to be more physically active, while sedentary women viewed young children as a barrier to such activities.

Not detecting a strong relationship between the presence of children and physical activity level is inconsistent with previous findings in the literature. Hull et al. (2010), Brown et al. (2009), and Ball et al. (2003) found a strong negative effect of having children on the physical activity level of women. This finding could be due to fact that most participants in the current study had children older than the age four years. In addition, the current study did not support the notion that the number of children may have an effect on physical activity levels (Hall et al., 2010; Larouche et al., 2012). However, the results of this study suggest that age of children may affect physical activity levels. This finding is consistent with the work of Nomaguchi and Bianchi (2004). This published study reported that the only factor noted to influence physical activity levels among women was having children under the age of 5 years.

Additional research investigating the relationship between the age of children and the effect on physical activity is necessary. In addition, it could be beneficial to adopt novel interventions that utilize activities for mothers and their young children.

Perceived Health Status

In the current study, the majority of the participants (62.3%) perceived their health status as either “Excellent” or “Very Good”, and approximately 33.0% of women described their health status as “Good.” Only 4.6% reported their health as being either “Fair” or “Poor.” According to quantitative results of this study, perceived health status was positively associated with higher physical activity levels in rural women. Those women who reported to perceive their health status as either “Good” or “Excellent” had higher involvement in physical activities. From a qualitative standpoint, participants that were more physically active tended to describe their physical health status as either “Good” or “Above Average”. Participants who were not physically active tended to describe their health as either “Good” or “Medium”.

According to the published research, physical health is an important determinant of physical activity level among women and may be a better predictor when compared to BMI. The research is consistent in indicating that women who perceived their health as either “Excellent” or as “Very Good” are more physically active when compared to women who perceived their health as “Poor” or “Fair” (Conn, 1998; Fleury & Lee, 2006; King & Castro, 2000).

Relationships between Intrinsic Motivation and History of Sports Participation

The quantitative results of the current study indicate that there is a positive strong statistical relationship between history of sports participation and intrinsic motivation. As participation in sports increased, the individual's intrinsic motivation for physical activity later in life increased. Moreover, according to qualitative results of this study, women who were active later in life also shared the fact that the involvement with their friends and family provided significant motivation to participate in sports at younger ages. In contrast, women who were inactive shared that both the pressure of participation from their parents or parental discouragement were the main factors that prevented them from engaging in organized sports. Upon analyzing qualitative data from this study, one may assume that the participants that were active later in life were extrinsically motivated to participate in sports by mimicking their friend's and family's behavior. This behavior may have eventually become more intrinsically motivated by the ability to enjoy the activity.

These findings are important because motivation is not a static factor but a continuum. When someone is extrinsically motivated, he/she is less likely to sustain the behavior when compared to people who are intrinsically motivated (Ryan & Deci, 2000). No previous literature discussed how history of sports participation may influence the formation of intrinsic motivation towards physical activity. Moreover, this study suggests that history of sports participation could be one of the factors that can help to develop the highest form of motivation for physical activity; therefore, this relationship should be investigated further.

Relationships Between Intrapersonal Determinants and Physical Activity Behavior

Types of Motivation and Physical Activity Behavior

According to Ryan and Deci (2000), the focus of the SDT is to unravel the underlying social factors and to explain the formation of an individual's motivation. The construct of motivation is essential to the proposed study, but it is important to repeat that motivation is not a one-dimensional concept. There are various degrees of motivation and they influence human behavior differently. For instance, intrinsic motivation is the highest form of motivation. Individuals who are intrinsically motivated are more likely to sustain the behavior when compared to individuals who are extrinsically motivated. Extrinsic motivation is the opposite from intrinsic motivation. It is based on the function of serving some purpose. For instance, a person who is engaged in the behavior to please others will be extrinsically motivated, and a person who is performing a behavior for personal growth will be intrinsically motivated (Ryan & Deci, 2000). Besides intrinsic motivation, there are three other types of extrinsic motivation that are described below: identified regulation, introjected regulation, and external regulation.

The results of this study indicated that the highest type of motivation for physical activity among rural women was identified regulation ($r = 4.70$), followed by introjected regulation ($r = 3.47$) and external regulation ($r = 3.46$). The mean score for intrinsic motivation (mean = 3.38) was the lowest among the women participating in this study. These outcomes were expected due to the fact that the majority of women were engaged in a moderate level of physical activity. Because such a small proportion of women in the sample were participating in recommended amount of physical activities, intrinsic motivation scores were the lowest. Another complicating factor was that only women

who had either a very high physical activity level or very low physical activity level were interviewed. Thus, it was difficult to precisely determine the type of motivation in qualitative portion of this current study. The relationship between intrinsic motivation, identified regulation, introjected regulation, external regulation and physical activity level in rural women ages 20 to 44 years are described below.

Intrinsic motivation is a naturally obtained predisposition that is vital for human growth (Ryan & Deci, 2000). Individuals who are intrinsically motivated are also more likely to motivate others and facilitate social changes to promote behaviors (Ryan & Deci, 2000). The current research hypothesized that women who have higher physical activity levels would be more intrinsically motivated. Data analysis for this hypothesis indicated that there was a strong positive relationship identified between intrinsic motivation and physical activity level in rural women. This finding supports the original study hypothesis. The qualitative data analysis also supported this hypothesis because all women in the high physical activity level group discussed the need to motivate themselves when it came to physical activities. Participants also mentioned the fact that the engagement in exercise makes them feel good, and participants indicated a desire to be healthier. The desire to develop new skills and the ability to enjoy activities associated with these skills are strong indicators of intrinsic motivation (Ryan & Deci, 2000).

Another form of motivation is identified regulation, a part of external motivation. Identified regulation means that a person is engaged in the activity because of the importance one ascribes to the behavior (Ryan et al., 2009). It is the concept within SDT that helps to motivate a person to exercise. According to SDT diagram (Figure 2) presented in Chapter 2 “Review of the Literature,” identified regulation is the closest type

of extrinsic motivation to intrinsic motivation. This means that people who scored high on identified regulation are more motivated when compared to people who scored high on other types of extrinsic motivation. Although it is more externally driven, identified regulation involves valuing a goal so the action would become personally important (Ryan & Deci, 2000). The results of the current study indicate a strong positive relationship between identified regulation and physical activity level. This relationship was also statistically significant. Due to the fact that most women in the study sample were engaged in moderate amount of physical activities, these findings were expected.

Introjected regulation is also part of extrinsic motivation. It is better described as behaving out of the sense of guilt (Ryan et al., 2009). According to SDT concepts, this type of motivation is similar to amotivation, which means the individual lacks motivation. People that are motivated by introjected regulation are less likely to engage in the behavior when compared to people who are guided by identified regulation or who are intrinsically motivated. According to the result of this study, a positive relationship was found between introjected regulation and physical activity level. However, this correlation was not as strong as the two previously described types of motivation.

External regulation is another concept that is introduced by the SDT. It is part of extrinsic motivation and it is closer to amotivation when compared to other types of extrinsic motivation. This suggests that people who are externally regulated are less motivated when compared to people who scored high on introjected regulation and identified regulation. The results of this study indicate a positive statistical relationship between external regulation and physical activity level among rural women. However, the relationship was not as strong as the observed relationship between physical activity

level and intrinsic motivation, identified regulation and introjected regulation. This finding may be due to a relative small sample size. Qualitative results also supported these findings. Sedentary women talked about the need to be motivated by someone else such as a friend or a husband. These findings suggest this group of women were more externally regulated, and these findings are consistent with the literature (Ryan et al., 2009). According to the self-determination continuum, the external regulation is closer to amotivation.

In conclusion, the results of this study support the SDT concepts. All types of motivation observed had a strong positive statistical relationship with physical activity level. However, further research is needed to more fully understand the factors that influence the development of intrinsic motivation.

Relationships between Social Support and Physical Activity Behavior

Husband's Support

It has been suggested that the activities of married women may be influenced considerably by their spouses (Berge, MacLehose, Eisenberg, Laska, & Neumark-Sztainer, 2012; Janzen & Cousins, 1995). Therefore, the current study examined the relationship of husband's support and physical activity level. Most participants (59.7%) reported that their husbands motivated them to be physically active. The results of this study suggest a positive statistically significant relationship between a husband's support for physical activity and physical activity levels of rural women. Moreover, husband's support seems to have a stronger effect on physical activity level when compared to other types of social support such as support from friends, other family members, and health care providers.

Qualitative results of this study did not identify themes that would encompass husband's support as a strong predictor of physical activity level in rural women, but this may be due to limited number of questions in the relevant content area. More extensive interviews that focus on husband's support and physical activity level of rural women may be needed to fully understand this topic.

The current findings are consistent with the studies that have broadened the context of marriage when examining associations to include, not only the effect of marriage on physical activity level, but also the importance of spousal support as a predictor of physical activity level (Miller et al., 2002; Peterson et al., 2008). Although there was a positive relationship between husband's support and physical activity level, further research is needed in this area. It may be important to include various types of commitments in future research efforts. In addition, due to the fact that husband's support may affect physical activity level of women, it is important to design physical activity interventions that have a “whole family” concept and involve not only women but also their significant others.

Family Athleticism

This study also examined the relationship between family athleticism and physical activity levels in rural women ages 20 to 44 years. More than half of the participants reported to have an athletic family while 40.3% of women indicated that their family was not athletic. The quantitative analysis indicated the relationship between family athleticism and physical activity level was positive but relatively weak. In addition, qualitative findings did not identify family athleticism as an important

determinant of physical activity among rural women. No previous studies were found that investigated this relationship.

Social Group Support

According to the SDT, social relationships play a significant role in the formation of physical activity behavior. Therefore, the current study analyzed the relationship between social support and physical activity level in rural women. A majority of the women reported that the people in their social circle are interested in being physically active, and most of the participants either “Somewhat” or “Strongly” agreed that at least one person in their life encouraged them to participate in physical activities. Data from this study suggested that support from friends was the second strongest factor to encourage physical activity when compared to other types of social support. Although the relationship was not very strong, the results indicated a positive statistical relationship between friends’ support for physical activity behavior and physical activity level in rural women. This study did not identify friend's support as a major theme for women that were already physically active. However, friend's support might affect motivation towards physical activities. Some women that were not physically active were thinking about initiating an exercise regimen due to encouragement from their friends.

The literature also provides evidence for the positive relationship between social support and physical activity level (Eyler et al., 2002; Shelton et al., 2011; Wilcox et al., 2003;). Research suggests that women ages 20 through 65 years who possess active living behaviors had higher social support for exercise when compared to sedentary women (Sternefeld et al., 1999). In addition, a review of the literature, published by

Gletsu and Tovin (2010) provided strong evidence for the importance of social support in promoting physical activity among African American women. Moreover, Sanderson, Foushee, Bittner, Stalker, and Pulley (2003) reported that among African-American rural women ages 20 to 50 years social support was positively associated with higher physical activity levels. Although there is strong evidence that social support affects physical activity level, more studies may be needed to investigate the relationship between friend's support and its effect on motivation to begin engaging in physical activity in rural women.

Health Care Provider Support

A majority of the participants (64.7%) reported that their health provider promoted physical activities; however 23.9% of the participant's studied were unsure about whether or not their health provider encouraged involvement in physical activities. Moreover, the results of this study indicate that the relationship between health care provider support for physical activity behavior and physical activity level was the weakest relationship observed among all the types of social support. In addition, the qualitative findings of this study did not indicate that health care provider support significantly affected physical activity level of rural women. This may be an indication that focusing on health care providers as a primary mechanism to promote physical activity in rural women may be not as efficient as focusing on other types of social encouragement. However, more research is needed in this area to more fully understand the dynamics.

Limitations

This section describes the limitations of this study. First of all, the results of the study cannot be generalized to all rural women. While general assumptions of randomness were made when determining the sample size, causality of the relationships cannot be determined given the nature of the study design. The participants were more educated and had a higher income when compared to general population. The researcher utilized a cluster sampling which could result in higher sampling error when compared to random sampling and expressed as “design effect”. However, according to the results of current study, the “design effect” in most cases was very low and, in some cases, indicated better outcomes when compared to random sampling. In addition, some people in the clusters were not reached which resulted in a smaller sample size and could have potentially affected the response rate.

Another limitation is due to the fact that this study relied on a self-reported instrument to collect the data. This approach could lead to inaccurate responses among rural participants. In addition, the questionnaire was lengthy which may have resulted in fatigue of the participants. It is plausible that the participants may have altered their responses in order to expedite completion.

The current research is also with respect to the reliability and validity of the instrument. Even though the instrument comprised questionnaires with the established reliability and validity, psychometrics of the whole instrument should be evaluated further. In addition, the specifics of the current population had required some alterations of the instrument that could affect the reliability and validity.

Finally, the in-depth interviews were conducted over the telephone. In this situation, the information from non-verbal communication and the environment could neither be assessed nor analyzed. In addition, only one researcher participated in coding and analysis of the qualitative information that may have introduced error. These limitations were overcome by conducting extensive in-depth interviews and utilizing previous experience of the researcher to code and analyze qualitative data.

Implications for Public Health Practice

Implications for public health practice include physical activity interventions for rural women that take into consideration work and family responsibilities. Physical activities are extremely important to combat obesity, osteoporosis, heart disease, cancer and other negative health outcomes (Kesaniemi et.al, 2001). It goes without saying that lack of environmental resources has a significant impact on physical activity level (Gay et al., 2011; Godin et al., 2009; Hankey et al., 2012). Since rural areas are especially deprived of financial oxygen and infrastructure, more attention should be given to designing effective physical activity interventions for rural women.

The first suggestion is to design physical activity interventions that would promote family participation and offer day-care for children. The current study indicates that women who have small children are less likely to exercise, a result consistent with previous research (Ball et al., 2003; Brown et al., 2009; Hull et al., 2010). The results of in-depth interviews further suggest that time spent carrying for small children and infants could be a significant barrier to physical activity among rural women. Therefore, providing day-care or designing interventions that include active programs for children

could be effective in promoting physical activities among rural women. The current study also proposes that early sports participation in children and teenagers may help to develop intrinsic motivation and increase the chances of life-long sustainability of active lifestyle. In addition, the results of this study indicate that husband's support plays a very important role in physical activity levels of rural women. Therefore, physical activity interventions that are based on "the whole family" concept may be effective.

Another suggestion is to design physical activity interventions that include a strength training component. Strength training plays an important role in women's health. It can result in multiple health benefits including a reduction in diabetes, obesity, osteoporosis, arthritis, back pain, depression, and it also increases bone mineral density (Brown, 2002; CDC, 2011;). The current study suggests that rural women might be unaware of the benefit of strength training on health. Therefore, it is extremely important to raise awareness and increase knowledge about the importance of strength training in women's health. In addition, providing rural women with skills to perform strength training is also necessary. Lastly, physical activity interventions that involve one-on-one interaction with rural women may be effective. These strategies would involve setting realistic goals, monitoring the progress, developing new skills, and designing individual programs that rural women enjoy. These strategies may assist in the formation of intrinsic motivation and result in sustainability of high physical activity involvement.

Implications for Future Research

Directions for future research include the studies that focus on an increase in the prevalence of physical activity among rural women. There is a paucity of literature that

focuses on working rural women. However, the research shows that getting married and having a first child significantly reduces the level of physical activity in woman (Larouche et al., 2012). Also, women who reside in rural areas reported more barriers to physical activity compared to their urban counterparts (Atkinson, et.al. 2007). Even though the current study focused on the determinants of physical activity in rural women, future research is needed.

The results of this study suggest that health care provider support for physical activities was the least important when compared to other types of social support. This finding could be due to the fact that health care providers do not stress enough the importance of being physically active. However, future research is needed to better understand this outcome.

Recently, the importance of strength training in women's health has been established (CDC, 2011). However, there is lack of literature that focuses on perceptions of strength training among women (Ratamess, et al., 2008). The current study utilized qualitative methods to explore the perceptions, knowledge, and skills of rural women in regards to strength training. The results suggest that rural women who are not involved in strength training are lacking knowledge and skills. In addition, women's perception about the effect of strength training on women's appearance is also misleading. Therefore, further research is needed in this area.

In addition, future research needs to further investigate the relationship between various types of motivation and physical activity in rural women. Specifically, the factors that influence the formation of intrinsic motivation have to be researched. Even though current study has found a significantly strong relationship between intrinsic motivation

and history of sports participation in rural women, future study should focus more investigating new factors that could help to form intrinsic motivation towards physical activities.

In summary, future research has to focus more on the role that health care providers plays in promoting physical activity; the perceptions, knowledge and skills of rural women in regards to strength training; and the formation of intrinsic motivation towards physical activities. In conclusion, some of the recommendations for future research design include establishing the reliability and validity of the utilized instrument, using more than one research to code and analyze qualitative data, and increasing sample size.

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Appendix A:
Physical Activity Questionnaire

PHYSICAL ACTIVITY QUESTIONNAIRE

Thank you for taking time to complete the survey

This questionnaire is designed to measure your physical activity level, past physical activity experience, social support, and motivation for physical activity.

Your participation in this survey is completely voluntary. Please do not include any identifying information such as name, address, etc. Completion of this survey indicates your consent to participate in this research study. Only information from persons between the ages of 20 and 44 years will be used in this research. The answers you give will be saved to the fullest extent possible. No individual responses will be reported, so please answer every question as honestly as you can.

Please select only one answer unless otherwise instructed.

Georgia Southern University Information

Dziyana Nazaruk, MPH, MSSM, CSCS

Phone: (716)208-4222

Email: dn00559@georgiasouthern.edu

Contact Information

Your answers will be treated as strictly confidential and will be used only for academic research

DEMOGRAPHIC CHARACTERISTICS

The following questions are about your Demographic Characteristics.

Please select only one answer

What is your gender?

- Male (Please discontinue participation)
- Female

Which of the following age ranges best describes you?

- Less than 20 (Please discontinue participation)
- 20-24
- 25-29
- 30-34
- 35-39
- 40-44
- 45 or older (Please discontinue participation)

What is your race?

- White, Non-Hispanic
- Black/ African American, Non-Hispanic
- Hispanic/Latino
- Asian/ Pacific Islander
- Other_____

What is your marital status?

- Single
- Married
- Separated
- Living together
- Divorced
- Widowed
- Other _____

What is your highest level of education?

- Less than High School
- High School or GED
- Some College
- Bachelor's degree
- Graduate degree
- Technical School
- Other _____

What is your household income?

- Under \$25,000
- \$25,000 to \$49,999
- \$50,000 to \$74,999
- \$75,000 to \$99,999
- \$100,000 or more
- I don't know

What best describes your current employment status?

- Full-Time
- Part-Time
- Unemployed

Do you have children?

- Yes
- No

If yes, how many children do you have? _____

If yes, how old are you children? _____

Please rate your overall health status?

- Excellent
- Very Good
- Good
- Fair
- Poor
- Don't know/Not sure

HOME ACTIVITIES

The following questions are about your physical activity level at home.

Please select only one answer

If traveling less than one mile, what form of transport do you most often use?

- Motor Vehicle (Car, Truck, Motorcycle)
- Bicycle
- Public Transport
- Walking

If traveling 1 to 5 miles, what form of transport do you most often use?

- Motor Vehicle (Car, Truck, Motorcycle)
- Bicycle
- Public Transport
- Walking

If traveling more than 5 miles, what form of transport do you most often use?

- Motor Vehicle (Car, Truck, Motorcycle)
- Bicycle
- Public Transport
- Walking

On a typical weekday, how many hours of Television do you watch?

- None
- Less than 1 hour/day
- 1 to 2 hours/day
- 2 to 3 hours/day
- 3 to 4 hours/day
- More than 4 hours/day

On a typical weekend, how many hours of Television do you watch?

- None
- Less than 1 hour/day
- 1 to 2 hours/day
- 2 to 3 hours/day
- 3 to 4 hours/day
- More than 4 hours/day

ACTIVITIES IN AND AROUND THE HOME

Please put a check (✓) on every line

Please indicate the approximate number of hours each week you spend on the following activities	average over the last 12 months						
	None	Less than 1 hour/week	1 to 3 hours/week	3 to 6 hours/week	6 to 10 hours/week	10 to 15 hours/week	More than 15 hours/week
Preparing food, cooking and washing up							
Shopping for food and groceries							
Shopping and browsing in shops for other items (e.g. clothes, toys)							
Cleaning the house							
Doing the laundry and ironing							
Caring for pre-school children or babies at home (not as paid employment)							
Caring for handicapped, elderly or disabled people at home (not as paid employment)							

ACTIVITY AT WORK

Please answer this section **only** if you have been in paid employment at any time during the last

12 months or you have done regular, organized voluntary work.

ACTIVITY LEVELS AT YOUR WORK

Now we would like you to take the total number of hours you worked per week in each job and divide them up according to your activity level.

Please put a check (✓) on every line

Please indicate the approximate number of hours each week you spend on the following activities at work	a v e r a g e o v e r t h e l a s t 1 2 m o n t h s						
	None	Less than 1 hour/ week	1 to 3 hours/ week	3 to 6 hours/ week	6 to 10 hours/ week	10 to 15 hours/ week	More than 15 hours/ week
Sitting e.g. desk work, or driving a car or truck							
Standing							
Walking at work							
Walking — carrying something heavy							
Moving, pushing heavy objects weighing over 75lbs							

STAIR OR STEP CLIMBING AT WORK

Please put a check (✓) on EACH line where appropriate

Number of times you climbed up a flight of stairs (10 steps) at work	AVERAGE OVER THE LAST 12 MONTHS						
	None	1 to 5 times a day	6 to 10 times a day	11 to 15 times a day	16 to 20 times a day	More than 20 times a day	
Job							

Please check (✓) one box ONLY per line

How did you normally travel to Job?	Never	Less than 1 hour/week	1 to 3 hours/week	3 to 6 hours/week	6 to 10 hours/week	10 to 15 hours/week	More than 15 hours/week
By car or public transportation							
By bicycle							
Walking							

RECREATION

Please give an answer for the **NUMBER OF TIMES** you did the following activities in the last 12 months and the **AVERAGE TIME** you spent on each activity.

Please complete EACH line

Average Over the Last 12 Months								
	None	Less than once/month	Once/month	2 to 3 times/month	Once/week	2 to 3 times/week	4 to 5 times/week	More than 6 times/week
Swimming EXAMPLE				30 min.				
Swimming								
Backpacking or mountain climbing								
Walking for exercise								
Riding a bicycle								
Mowing the lawn								
Digging, shoveling or chopping wood								
Weeding or pruning								
High impact aerobics or step aerobics								
Exercises with weights								

Conditioning exercises (e.g. riding a stationary bicycle, rowing machine, elliptical machine, etc.)								
Flexibility exercises (e.g. stretching, bending, keep fit or yoga)								
Dancing								
Running								
Golf								
Playing sports (e.g. tennis, badminton, volleyball, basketball, racquetball, football, soccer, baseball, etc.)								
Martial arts, boxing or wrestling								

PAST PHYSICAL ACTIVITY EXPERIENCE

Organized sport- Physical activity that is governed by a set of rules or customs and often engaged in competitively

The following questions are about your past physical activity experience.

Please select only one answer

Did you play organized sports in elementary school?

- Yes
- No

Did you play organized sports in middle school?

- Yes
- No

Did you play organized sports in high school?

- Yes
- No

Did/do you play organized sports in college? (i.e., baseball, basketball, football, golf, tennis, volleyball, soccer, softball, swimming and diving cross country and track and field)

- Yes
- No

SOCIAL SUPPORT FOR PHYSICAL ACTIVITIES

The following questions are about support from your family and friends for physical activities.

Please circle only one answer:

My own family is athletic.

1

2

3

4

5

Strongly Disagree Somewhat Disagree Unsure Somewhat Agree Strongly Agree

I have been encouraged by at least one person to develop or maintain my physical abilities beyond what was normally expected for the average woman.

1 2 3 4 5

Strongly Disagree Somewhat Disagree Unsure Somewhat Agree Strongly Agree

My health care provider is in favor of me participating in vigorous (sweat-inducing) physical activity.

1 2 3 4 5

Strongly Disagree Somewhat Disagree Unsure Somewhat Agree Strongly Agree

My husband is in favor of me participating in sweat-inducing physical activity (if applicable)

1 2 3 4 5

Strongly Disagree Somewhat Disagree Unsure Somewhat Agree Strongly Agree

The people I spend most of my time with now are interested in physical fitness activities (friends).

1

2

3

4

5

Strongly Disagree Somewhat Disagree Unsure Somewhat Agree Strongly Agree

MOTIVATION FOR WORKING OUT

There are a variety of reasons why people work out.

Please indicate how true each of these reasons is for why you work out and circle only one answer

Because I simply enjoy working out

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

Because working out is important and beneficial for my health and lifestyle

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

Because I would feel bad for myself if I did not do it

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

Because it is fun and interesting

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

Because others like me better if I am in shape

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

Because I would be afraid of falling to far out of shape

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

Because it helps my image

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

Because it personally important to me to work out

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

Because I feel pressured to work out

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

Because I have a strong value for being active and healthy

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

For the pleasure of discovering and mastering new training techniques

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

Because I want others to see me physically fit

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

**If you would like to participate in in-depth interviews
please provide your contact information:**

Name _____

Phone number _____

Email address _____

You have finished the questionnaire- Thank you

Appendix B:
Semi-Structured Interview Guide

Semi-Structured Interview Guide

Category: Background Determinants

- 1) Can you tell me a little bit about yourself? (Marriage, children)
- 2) How would you describe your health?

Category: Physical Activity

- 1) Have you participated in organized sports when you were in elementary, middle, and high school?
- 2) Can you tell me about your everyday routine?
- 3) Do you exercise? If yes, please describe your exercise routine. (Planned and structured physical activity. Ex: running, playing sports, working out at the gym, participating in fitness classes)

Category: perceptions of young rural women regarding strength training

- 1) What are some things that come to mind when I say “strength training”? (Probe: think about some positive and negative sides of strength training)
- 2) What do you think of when you see woman strength training?

Category: skill level of young rural women regarding strength training

- 1) Tell me about your exercise routine that involves the use of body weight, free weights, or any other type of resistance. (Probe: What are some exercises that involve the use of resistance that you perform? Do you use body weight, free weights or machines?)

Category: knowledge of young rural women regarding strength training

- 1) What is strength training? (Probe: Provide some example of strength training exercise)
- 2) What role does strength training play in women's health?
- 3) Can you think of any undesirable things that might happen as a result of strength training?
- 4) If a friend came to you for an advice regarding working out, would you recommend strength training? Why? Why not? If yes, name some of the exercises that you would suggest to your friend.

Category: types of motivation in young rural women regarding strength training (based on SDT)

- 1) How do you think strength training would affect (or affects) your fitness (the condition of being physically fit and healthy)?
- 2) How do you think strength training would affect (or affects) your appearance?

- 3) How difficult or easy it is to perform strength training?
- 4) Tell me about your friends or family involvement in strength training? (Probe: how people in your social circle view strength training?)
- 5) How does it make you feel to be engaged in strength training? (Probe: do you enjoy strength training?)