

The Determinants of Strength Training in Rural Women, Ages 20-44 Years: A Qualitative Study

Nazaruk D*, Tedders SH, Alfonso ML and Vogel LR

General Practice and Public Health, Georgia Southern University, Statesboro, Georgia, USA

Abstract

Despite multiple health benefits of strength training, 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 strength training in rural women. In-depth interviews were utilized to identify the perceptions, knowledge, motivation, and skills regarding strength training. Fifteen women from four target counties participated in this qualitative study. The study was guided by Self-determination Theory. Results indicated that factors such as the lack of knowledge about strength training, the lack of skills, the history of sports participation and the perceived effect of strength training on a woman's appearance can possibly explain some of the reasons for low strength training participation among rural women in Georgia. In addition, this study suggests that history of sports participation could be one of the factors that can develop the highest form of motivation for physical activity; therefore, this relationship should be investigated further. 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.

Keywords: Self-determination theory; Motivation; Rural health; Strength training; Rural women

Introduction

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 [1]. Strength exercises are intended to force increasingly greater resistance which, in turn, stimulates development of muscle strength to meet the additional demand [1]. Strength training can result in multiple health benefits including a reduction in diabetes, obesity, osteoporosis, arthritis, back pain, and depression [2]. Evidence suggests this activity also increases bone mineral density, improves sleep, builds healthy heart tissue, and slows down the aging process [2]. Strength training can be easier to tolerate [3] and a faster way to burn fat when compared to aerobic exercise alone [4]. In addition, strength training could have similar positive cardiovascular benefits as noted for aerobic training [5]. For women, strength training could be especially appealing due to the fact that these activities improve overall physical appearance and body image [6].

Despite the multiple health benefits of strength training, a relatively small proportion of adults in the United States engage in this activity. According to the Healthy People 2020 baselines, only 21.0% of adults performed muscle-strengthening activities on 2 or more days of the week in 2008 [7]. One can assume that the numbers are even lower for women. 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.

The purpose of this study was to utilize in-depth interviews 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. The following research question was addressed by qualitative measures: What is the difference between young, rural women who do and who do not adhere

to ACSM physical activity guidelines regarding strength training? The following sub-questions were included in the study:

1. What are the physical activity levels?
2. What is the history of sports participation?
3. What is the knowledge of rural women ages 20-44 years regarding strength training?
4. What is the skill level of rural women ages 20-44 years regarding strength training?
5. What are the perceptions of rural women ages 20-44 years regarding strength training?
6. What is the motivation of rural women ages 20-44 years regarding strength training?

Self-determination Theory

Current study utilized Self-determination Theory (SDT) perspective. SDT aims to take into consideration not only the activity of the human nature, but also the tendencies for passivity [8]. 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

*Corresponding author: Dziyana Nazaruk, Primary Care, General Practice and Public Health, Georgia Southern University, Statesboro, Georgia, USA, Tel: 912 441 1062; E-mail: dnazaruk@georgiasouthern.edu

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promote behaviors [8]. The concepts based on the SDT framework have been utilized in multiple studies to analyze physical activity patterns [8]. Stephan et al. 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 [9]. Another study supported the relationship between the SDT concepts such as autonomy, relatedness, competence, and high perceptions of convenience to places for exercise [10].

Methods

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. 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 qualitative data collection were sampled. The general approach for tapping this network 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 find participants.
2. To provide the number of possible groups that could potentially be interviewed.
3. To provide contact information of 8 to 15 women in each community between ages of 20 to 44 who may be willing to participate in in-depth telephone interviews.

Design and Approach

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 [11]. 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. In other words, the researchers have continued sampling and analyzing new data until no new data appeared. Among the target group (rural women ages 20-44 years), the qualitative research question and sub-questions included the following:

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

Recruitment of Subjects

The participants were recruited through community representatives in the four target counties (Clinch, Jeff Davis, Toombs, and Pulaski Counties). Community representatives solicited 8 to 15 women that met the inclusion criteria for age and gender to participate in in-depth interviews. 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 [12]. 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 [12].

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 [1].

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 Table 1.

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

IRB review at Georgia Southern University at Statesboro, GA was obtained. 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 purpose of the study, 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. It was made clear to subjects that participation is voluntary and that they may withdraw at any time.

Results

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 explored 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
- (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

Research Sub Questions	Interview Questions
What is the knowledge rural women ages 20-44 years obtain 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.
What is the skill level of rural women ages 20-44 years 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?)
What are the perceptions of rural women ages 20-44 years 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
What is the motivation of rural women ages 20-44 years possess regarding strength training? (Self-Determination Theory)	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?)

Table 1: Research sub-questions and interview questions.

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 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 2).

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

Demographic Variable	High Physical Activity Group (N)	Low Physical Activity Group (N)
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
3-Feb	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

Table 2: Demographic characteristics.

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 [8]. 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 hunched 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)

Discussion

Overall physical activity level

Qualitative results 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 previously reported, the lack of time was a significant barrier to physical activity [13]. 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 [13]. 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 [14].

Strength training

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. One study 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 [15]. 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 [2]. 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 [16], improvements in quality of sleep, and

the building of healthy heart tissue [2]. Lastly, it is documented that adequate strength training could have similar positive cardiovascular benefits as noted for aerobic training [5].

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. One study 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 [17].

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.

History of sports participation and strength training

Another interesting finding was in regards to relationships between history of sports participation and strength training. As the participants' involvement in organized sports increased during school and college years, there was an increase in physical activity level later in life. 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.

Perceived health status and strength training

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" [18-20]. The results of this qualitative study were consistent with previous research. 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".

History of sports participation and motivation

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 [8]. 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.

Social support

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 [21-23]. 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 [24]. In addition, a review of the literature, published by Gletsu and Tovin provided strong evidence for the importance of social support in promoting physical activity among African American women [25]. Moreover, another study reported that among African-American rural women ages 20 to 50 years social support was positively associated with higher physical activity levels [26]. 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.

Limitations

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.

Conclusion

Based on the results of this study, one of the suggestions is to design physical activity interventions that include a strength training component. For example, physical activity interventions can include either free weight training in order to engage the maximum number of muscles, or bodyweight training. In addition, women who were not involved in strength training in the past can start by using a resistance machine in order to prevent injuries and learn proper technique. 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 [2,16]. 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.

In conclusion, the importance of strength training in women's health has been recently established [2]. However, there is lack of literature that focuses on perceptions of strength training among women [17]. 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.

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