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## The Effects of an On-Site Exercise Program on Health and Health Behaviors in Community Dwelling Adults Living in a Subsidized Apartment Building

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The Effects of an On-Site Exercise Program on Health  
and Health Behaviors in Community Dwelling Adults  
Living in a Subsidized Apartment Building

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April 1, 2016

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## **Abstract**

**Introduction:** Physical activity is an important component of a healthy lifestyle. Immigrants and people of low income are at a higher risk for physical inactivity. Lack of familiarity with exercise equipment, facility costs, safety, transportation issues and winter weather have been identified by Somali immigrant populations as barriers to physical activity.

**Purpose:** The purpose of this study is to examine the effect of an apartment-based exercise program on the quality of life (QOL), activity level, and general strength of a community dwelling population comprised primarily of elderly Somali immigrants.

**Methods:** An exercise program was offered to residents at a subsidized apartment building. Monthly exercise sessions included strength, balance, stretching, aerobic activity, and an educational component. Outcomes at baseline and following the six month program included: the abbreviated World Health Organization Quality of Life (WHOQOL-BREF), General Practice Physical Activity Questionnaire (GPPAQ), and Five Times Sit to Stand Test (FTSST). Interview sessions were completed at the end of the six month program.

**Results:** Of the 12 subjects that completed the informed consent process, eight subjects completed baseline measurements. Three subjects participated in one (of six) exercise sessions. Those three subjects completed the outcome measures and attended a brief interview session after the exercise program was completed. Although the number of participants limited statistical analysis, the trend of these three participants demonstrated no change in physical activity level for two subjects, while one subject increased physical activity. Functional strength improved in two participants and decreased in another. QOL outcomes were inconsistent except for the environmental domain, which decreased for all participants. Qualitative analysis of the interviews revealed that participants valued physical activity and logistical considerations such as: timing, frequency, content and communication about the exercise program were important factors for participation. Life events and procedural requirements of the program were noted as barriers.

**Conclusion:** Despite initial interest in the exercise program, participation in the sessions was low which limited analysis of activity level, quality of life and functional strength outcomes. Qualitative outcomes demonstrated that participants value physical activity and program timing and content should be carefully considered prior to initiation of future programming.

The undersigned certify that they have read, and recommended approval of the research project entitled...

The Effects of an On-Site Exercise Program on Health and Health Behaviors in Community Dwelling Adults Living in a Subsidized Apartment Building

Submitted by,

Alexandra Anders  
Chad McNutt  
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in partial fulfillment of the requirement for the Doctor of Physical Therapy Program

Primary Advisor Jennifer Brice Date 4/25/14

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## **Chapter I: INTRODUCTION**

Physical activity is one of the most important aspects of maintaining good health. The World Health Organization (WHO) defines physical activity as “any bodily movement produced by skeletal muscle that requires energy expenditure”.<sup>1</sup> Physical activity has been a point of emphasis as the population becomes more sedentary, obesity continues to be an epidemic, and people spend more time in front of electronic screens. Physical activity includes anything from moderate to vigorous activity as described by the Centers for Disease Control and Prevention (CDC).<sup>2</sup> The Department of Human Health in “Healthy People 2010” listed activity level as a leading health indicator.<sup>3</sup>

A number of diseases have been linked to a sedentary lifestyle. With a lack in physical activity, there is an increased risk of stroke, early death, heart disease, several cancers, type 2 diabetes, and depression.<sup>4</sup> Benefits to being active include improved bone health, longer life span, improved weight control, reduced risk of falls, and decreased risk associated with inactivity.<sup>4,5</sup> Seniors living a sedentary lifestyle have additional risks such as a higher mortality and morbidity rate.<sup>6</sup> Benefits of physical activity for this group include delay of age related functional declines, increased independence, and enhanced physical function.<sup>7</sup>

A sedentary lifestyle is defined in many ways, including not meeting minimum standards of activity. The WHO states that an adult should get a

minimum of 30 minutes of physical activity five times per week.<sup>5</sup> The CDC sets the standard at 250 minutes of moderate aerobic exercise per week, 120 minutes of vigorous exercise per week, or a combination of the two, all coupled with two days per week of strengthening all major muscle groups in the body.<sup>2</sup> While these standards are important benchmarks to hit, a study by Arem et al. found that exercise well below 150 minutes per week is better than no exercise at all.<sup>8</sup>

There are an alarmingly high number of people not meeting the minimum standards set by the WHO and the CDC. About 25% of the world's population of adults falls short according to the World Health Organization.<sup>9</sup> In the United States, numbers are much worse as 79% of the population is not meeting the CDC's standards, certain groups are affected more than others. The elderly are less likely to meet the published exercise standards.<sup>4</sup> Low-income residents living in deprived neighborhoods and minorities are at a higher risk as well.<sup>10,4</sup> Only 18% of African Americans and 16% of Hispanic Americans meet the standards set by the CDC.<sup>4</sup> One study found that multiple immigrant groups were at a higher risk of inactivity as well as other preventable health problems such as smoking and obesity.<sup>11</sup>

Minnesota is home to the largest group of immigrants from Somalia in the United States, with 87,854 Somali residents as of 2008.<sup>12</sup> Somali immigrants are at a high risk for hypertension and diabetes mellitus type 2.<sup>13</sup> Somali women have an increased risk for obesity, being overweight, and partaking in



little physical activity.<sup>14</sup> Studies by Perrson et al<sup>15</sup>, and Mohamed et al<sup>16</sup> examined perceived barriers of Somali immigrants for exercising. Barriers identified in these studies included less walking opportunities, embarrassment about exercise clothing, lack of familiarity with exercise equipment/modalities, fear of harassment, competing priorities, facility costs, transportation, winter weather, religious concerns, and not being part of their tradition.<sup>15,16</sup> Facilitators to being physically active in the United States included having knowledge about how to be active, residing in a safe and comfortable environment, hearing success stories related to becoming physically activity in the community, and having good cohesion in the community.<sup>15,16</sup>

The Minneapolis Public Housing Authority (MPHA) serves the low income population by providing subsidized housing, and offering services to the residents such as social work services, an epilepsy and brain injury program, and congregate dining.<sup>17</sup> With support from the Minneapolis Department of Health, MPHA conducted listening sessions at a sample of their building sites on the topics of walking and exercise. Similar to barriers already identified, residents noted barriers for walking included poor snow and ice clearance on sidewalks and streets, uneven pavement and sidewalks, feeling unsafe crossing streets, and not having enough time to cross the streets.<sup>18</sup> Barriers to other forms of exercise were broken exercise equipment and the need to learn how to use the equipment.<sup>18</sup>

Due to the increased risk of a sedentary lifestyle in low income, minority, elderly and immigrant groups, there is a need for more research on interventions to help overcome barriers to physical activity in these groups. Access to a subsidized apartment building where people are at a high risk for inactivity reside and where people are interested in having an exercise program is a good place to promote physical activity. The purpose of this study is to examine the effect of an apartment-based exercise program on the quality of life (QOL), activity level, and general strength of a community dwelling population comprised primarily of elderly Somali immigrants.

## **Chapter II: LITERATURE REVIEW**

A review of current literature including studies examining the effects of community based exercise programs with minority populations revealed various health and wellness programs implemented nationally and internationally targeting minority populations. Minority populations in this search were broadly defined to refer to minorities of race as well as other populations at increased risk for inactivity including women and the elderly. Studies utilizing primarily qualitative methods such as focus groups and interviews to examine reasons for participation and participants' opinions of programs found that social support, awareness of health benefits and program proximity to home to be common themes influencing participation. Studies utilizing primarily quantitative outcome measures to examine physical and emotional effects of exercise program participation consistently found improved health and wellness scores when comparing program participants to their less active matched controls.

Two studies utilized interviews to examine ideal components of community exercise programs. A study from 2008 by Chiang et al. held focus groups involving ethnic minority populations participating in an ongoing exercise program.<sup>19</sup> The purpose of the focus groups was to uncover what factors promote continued participation in an exercise program according to older adults from particular ethnic groups. The study grouped information into four categories: physical environment, program design, social environment,

and individual behavior/biology.<sup>19</sup> Participants appreciated that the program took place in their neighborhoods and that the program included exercises for the whole body. These factors pertained to the physical environment and program design categories.<sup>19</sup> Regarding the social environment, participants expressed adherence to the program due to the ability to socialize in a shared language, receive support from fellow participants, family, health care providers and from the program instructors themselves.<sup>19</sup> Finally, this study found that in the behavior/biology category common personality traits expressed by participants that adhered to the exercise program included statements about competitiveness, perseverance, confidence and a positive attitude.<sup>19</sup> A second study done in 2008 by Schmidt et al. examined reasons for exercise program participation in women residing in socioeconomically deprived neighborhoods.<sup>20</sup> Interviews revealed that the advice and support from the referring doctor, instructor-led environments, small same-sex exercise groups, and nearby location were all motivating factors to start exercising.<sup>20</sup>

Other studies examined change in physical and mental health outcomes following exercise programming. Intervention program lengths ranged from 8 weeks to 11 months, meeting one to three times a week. Two programs included educational or “personal coaching” sessions explaining the benefits of exercise during the sessions.<sup>21,22</sup> A 2012 study by Gademan et al examined the effects of an exercise program in which participants were

women from various cultural backgrounds living in deprived neighborhoods and were referred by their doctors.<sup>21</sup> The program lasted eighteen sessions. The coaching for the first nine sessions focused on increasing awareness of the benefits of exercise, with the goal being to increase motivation, and the following nine sessions focused on providing participants with knowledge and skills needed to continue exercising independently once the program ended.<sup>21</sup> The amount of time spent on coaching or material presented was not specified. Similarly, an eight week exercise program targeting elderly, low income, South Korean immigrants was conducted in 2009 by Shin et al and 15 minute educational sessions were provided during the first four weeks of the program.<sup>22</sup> The topics for education related to changes in exercise ability related to aging and elderly as well as types, precautions, and benefits of exercise.<sup>22</sup> Gademan and Shin both looked at the effects of their programs on mental well being in addition to a variety of physical measures. Gademan et al included subjective measures of health and well-being through participant-reported amount and intensity of physical activity, participant-rated perceived health, and reported number of doctor visits in the past two months.<sup>21</sup> Objective measures of physical health included body mass index (BMI), waist circumference, and fat percentage. Well-being was measured with the Well-Being Questionnaire Short-Form (W-BQ12).<sup>21</sup> Shin et al took a slightly different approach, including measures such as BMI, cardiopulmonary endurance via heart rate and blood pressure, muscle strength via grip

strength, flexibility was determined by the degree one could bend at the hips relative to the floor, and balance was assessed through amount of time one could spend in a single leg stance with their eyes closed.<sup>22</sup> Depression and self efficacy assessments were utilized to determine well-being. They were measured by the center for epidemiological studies depression scale (CES-D) and the modified Lee's scale.<sup>22</sup> Despite the different measures utilized, both studies found positive effects on physical and mental health measures for those participating in the exercise program.

Several studies focused exclusively on physical outcomes. An exercise program working with elderly Korean immigrants for 50 minutes, three times a week for twelve weeks in 2005 looked for change between pre and post-test measures of an arm curl test, 8-foot up and go test and blood pressure measurements.<sup>23</sup> A similar study looking exclusively at physical outcome measures from 2010 by Van Roie compared BMI, blood pressure, total cholesterol, hand grip strength, 30 second sit to stand, arm curls, and maximal cardiovascular endurance between two groups of sedentary elderly adults performing either a home exercise program or a more structured group program with supervised training .<sup>24</sup> Both intervention groups lasted 11 months and had the same components of strength, balance, endurance, and flexibility.<sup>24</sup> Finally, one other study looking solely at physical outcomes was conducted in 2013 by Hernandez et al.<sup>25</sup> This study looked at the incidence of co-morbidities, along with results of a 6 minute walk test, maximal exercise

shuttle walk test, grip strength, sit and reach, 30 second sit to stand, single leg balance, and a cone drill to test agility. They compared the results of these measures between a group of sedentary elderly adults and a group participating in already implemented community based exercise programs.<sup>25</sup>

One study was unique in the creation of a culturally tailored program for its participants. A 2005 study by Resnicow et al provided dietary and physical education interventions to African Americans recruited through their churches.<sup>26</sup> Participants were asked to rank food and activity preferences to get an idea of what was important to that population. The preferences then served as a basis for formation of the interventions. A nutrition video, cookbook, activity guide and cassette walking tape integrating spirituality and contributions from church members were created for this population.<sup>26</sup> In addition to tracking fruit and vegetable intake, this study utilized physical measures such as sub-maximal treadmill tests for aerobic capacity, blood pressure, and BMI to measure physical change from baseline to one year later.<sup>26</sup>

Regardless of timeframe, population, program style, or outcome measure, all eight studies revealed significant positive effects on physical fitness, mental health, and well-being of intervention groups. It is suggested that an exercise program will be successful if it resonates with the cultural values of the population it seeks to influence.<sup>27</sup> A limited number of studies have examined strategies for creating culturally tailored programs and have

studied the relevance of these efforts. A literature review conducted in 2013 by Conn et al attempted to identify strategies used in studies providing physical activity to minority populations, to make the program more relevant to that population.<sup>27</sup> In summary, several tactics they discovered were indeed utilized in the studies previously reviewed in this paper. These included: involving members of the population in the formation of the intervention, recruitment from churches or other gathering spaces frequented by the target population, using outcome measures translated to the target population's primary language, providing child care, and choosing locations that required little or no transportation.<sup>27</sup> Integration of components of one's faith, testimonials of group members, and utilization of important media figures were also utilized to make the programs more culturally relevant.<sup>27</sup> This study did not attempt to quantify the effectiveness of the different strategies but rather expose those that have been utilized.

At this time the number of studies looking at physical activity in minority populations is limited. Although all the studies were of varied lengths and styles and involved a variety of minority populations with a variety of initial fitness levels, several conclusions can be drawn. Good social support, close proximity to home, structured exercise, and small classes appear to be facilitators to participation in an exercise program.

It is known that structured exercise programs have a positive impact on amount of physical activity and performance on physical and mental outcome



measures.<sup>19-26</sup> But the question remains as to why cultural minority and elderly populations have higher rates of inactivity in the first place. Several studies investigated perceived barriers and facilitators to exercising in specific populations.

A study by Gele et al. conducted unstructured interviews with 30 Somali women.<sup>28</sup> Among the topics discussed were knowledge of diabetes, perspective of and barriers to prevention of diabetes, as well as ideal means of performing preventative interventions. All of the subjects knew diabetes was harmful and preventable.<sup>28</sup> They reportedly were aware of their unhealthy dietary habits and that diabetes was linked to inactivity.<sup>28</sup> The subjects listed several barriers to physical activity including: caring for children, cost of gym memberships, lack of time, lack of gender exclusive gymnasiums, and traumatic incidents in Somalia that caused them to avoid public spaces.<sup>28</sup> In summary, the preferred characteristics of an exercise program include being conducted in their native language, offered at a convenient location, and require little to no cost.

Another study by Deforche et al. compared 150 older adults participating in a structured exercise program to age matched controls.<sup>29</sup> Subjects answered questions pertaining to perceived barriers and facilitators to exercise, self efficacy, and social variables. Barriers most frequently listed by the subjects were lack of time, lack of interest, and fear of injury, followed by health problems, as well as structural and organizational problems (too

expensive, lack of information, lack of appropriate exercise programs).<sup>29</sup> The major perceived benefits included physical and health benefits followed by pleasure and social interaction.<sup>29</sup> Interestingly the perceived barriers did not vary between subjects who attended an exercise program, and those who did not. A similar study compared older adult subjects involved in an exercise class to age matched peers not enrolled in an exercise class.<sup>30</sup> Subjects not involved in the class reported barriers such as: fear of meeting new people, not knowing what to expect in the class, fear of exercising without a doctor's consent, low motivation, and lack of awareness that the program existed.<sup>30</sup> Barriers to continued exercise reported by those who did participate in a class included: not feeling well, appointments, transportation, insufficient knowledge, and lack of space in their home.<sup>30</sup> Two other studies looking at older adults' perceived barriers to physical activity in general included lack of time, proper facilities, and energy/perceived ability.<sup>31,32</sup> Perceived facilitators included a desire to maintain physical and mental health as well as access to affordable and convenient options.<sup>32</sup>

Utilizing information, strategies, and knowledge of barriers gathered from the reviewed literature an exercise program was developed. This program was implemented in a Minneapolis public housing community and sought to measure change in physical and emotional health as well as utilize interviews for feedback after the program was over. It was hypothesized that after participating in the program participants would corroborate these

objective findings as well as offer ideas for optimal participation in future community based exercise programs.

## **Chapter III: METHODS**

### **Study Design**

This study used a mixed methods approach which included quantitative and qualitative research to gather information on outcomes of a community-based exercise program. Quantitative research provides an objective way to measure outcomes using a statistical approach. Qualitative research provides a way to study perceptions and behaviors of a group in regards to a certain topic or issue.<sup>33</sup> This type of research tends to be more descriptive and less predictive than quantitative research.<sup>33</sup> Both methods are valuable to understanding outcomes in this study. The quantitative portion focused on pre- and post-outcome measure scores of health-related quality of life, physical activity, and functional strength. The qualitative portion included semi-structured interviews obtained after the program ended, in which the researchers asked several questions about the subject's perception of the quality and impact of the exercise program.

Six exercise sessions over the course of six months were planned at a subsidized apartment building, resulting in one session per month. Each session was projected to last 45 to 60 minutes and included an educational component. In between sessions, participants were encouraged to exercise independently on their own. The time and day of the exercise sessions remained consistent each month and were chosen by the researchers with administrative and resident input. A total of 10 to 20 subjects were projected

to participate in the program. Direct benefits of participating in this research included possible health benefits associated with increased physical activity. Incentives were given to encourage participation in interview sessions.

### **Participants**

Participants in this study were recruited based on location of residence. All were part of a community living at a subsidized apartment building owned by the MPHA. Of the 254 residents living in this building, 130 are male and 124 are female. Of the total residents, 192 are over age 50, with 143 residents between ages 50-70, and 49 residents 71 years and older. Ninety-two percent are labeled as “black”, 7% are “white”, with the remaining 1% representing a variety of other races. In addition, 70% reported they are Somali-born, 20% were born in the United States, and 69% of the residents are described as “disabled”. Therefore, the majority of the population at the apartment building are elderly Somali immigrants. This community had expressed interest in a regular exercise program led by an outside source. Participants were included if they were residents of the apartment building and over 18 years of age. Additional inclusion criteria required that each subject obtain a signed medical clearance form from their primary care physician giving them clearance to safely participate in a community based exercise program. Participants were recruited using flyers, communication with the administration of the building, and personal conversations with the

residents on site. Demographic information obtained included birth date, gender, name, and apartment number.

### **Procedures**

This study was approved by the Institutional Review Board of St. Catherine University prior to the recruitment of participants and start of the exercise program. The four researchers included three physical therapy students and one licensed physical therapist who served as faculty advisor. Together these researchers developed a plan for each exercise session including preparing educational components prior to beginning the program. Outcome measures with specific information about each subject were selected, including a physical performance measure, a quality of life survey, and a questionnaire about each participant's physical activity levels.

The first outcome measure used was a shortened version of the World Health Organization's Quality of Life measure, or the WHOQOL-BREF. It measures physical, social, psychological, and environmental domains in a 26 item subjective survey. A study by Skevington et al. has established that internal consistency, reliability, and validity (construct and discriminant) are "good to excellent" and also suggests test-retest reliability has already been established as good for indicating changes in quality of life.<sup>34</sup> This measure was chosen because it has been translated into many languages including Somali, in which the modified translated version was obtained for use.<sup>35</sup>

Ultimately, this version was not used as the interpreter available in this study was fluent but not literate in the Somali language. However, concepts from the Somali-translated WHOQOL-BREF were used to ease the participants' understanding of specific terms and phrases.<sup>35</sup>

The Five Times Sit to Stand Test (FTSST) was used to measure lower extremity strength. In addition to strength, FTSST is a good measure of overall balance.<sup>36</sup> To perform this test, the participant transitions from sit to stand from a chair without armrests five times as the administer of the test records the time it takes to complete the task. This measure has good to excellent test-retest reliability (ICC = 0.89 - 0.957), adequate construct validity, and excellent correlation to the Timed Up and Go test and gait speed ( $r = 0.918$  and  $0.943$ ), which are both good tests for measuring falls risk in an older population.<sup>36</sup>

The General Practice Physical Activity Questionnaire (GPPAQ) was used to examine physical activity. It was developed to provide a way to reflect on one's current physical activity and for use in general practice settings when an intervention might be appropriate to increase physical activity.<sup>37</sup> The GPPAQ was chosen to obtain a baseline of each participant's physical activity. The GPPAQ is not designed for use as a pre- and post-test measure, but as a way to track physical activity for individuals.<sup>37</sup> While a recent study by Ahmad et al suggests the GPPAQ has reasonable reliability and questionable validity in an older population, overall the GPPAQ has been established as a

valid and reliable tool to assess an individual's activity levels.<sup>37,38</sup> The GPPAQ was utilized as a quick and easily understood measure to determine participants' level of physical activity.

Before obtaining any baseline data, the informed consent process was initiated. Information about the program was provided at a resident council meeting and at an open session where residents were invited to inquire about the program. Residents were invited to the open session as well as exercise program sessions by flyers posted in approved areas and by apartment administration reminders. Residents were asked to have the medical clearance form signed by their primary care physician. Informed consent was obtained using a form approved by the Institutional Review Board and was signed by each participant. Due to the majority of participants being non-English speaking, the forms were read to them by researchers and then interpreted by the onsite social worker into the Somali language if needed. Demographic data was then gathered including age, apartment number, gender, and name. Baseline data on the FTSST, WHOQOL-BREF, and GPPAQ was gathered on participants who completed the informed consent process. Low English fluency was expected and the social worker of the building, fluent in Somali and English, was secured to provide interpretation for both the informed consent process and outcome measure completion.

After outcome measures were obtained and medical clearance approved, the subjects were able to participate in the exercise sessions.



Planned exercise sessions included a variety of activities including strengthening, stretching, cardiovascular endurance, and balance components. In addition to the exercise, education was planned on several topics including: exercise safety and tips, precautions to exercise and types of exercise, monitoring exercise using the RPE scale, blood pressure education, blood sugar and diabetes education, and benefits and progression of exercise. These topics were chosen to increase awareness of safe exercise and to inform the community on relevant topics for middle-aged to older adults, which primarily made up the target population of this study. Demonstration and explanation was given for exercises and activities performed. After all the exercise sessions were completed, participants completed the WHOQOL-BREF, FTSST, and GPPAQ again. Finally, exercise session participants were asked to attend a short interview session to further assess impact of the exercise program as well as inquire about barriers to participation. Interview questions are shown in the table.

### **Timeline**

The exercise program lasted six months total. Information sessions and the informed consent process were initiated six to eight weeks prior to the first planned exercise program, to allow for return of physician clearance forms. Each exercise session was held once per month on a Monday afternoon. The starting time for the exercise sessions was held at the same

time each month to ensure consistency for the subjects. Once the six months passed, post-program data collection began in the month following for subjects who participated. All subjects who completed the informed consent process were invited to complete post-program outcome measures and interviews regardless if they participated in any exercise sessions.

### **Qualitative Data Analysis**

Data analysis of semi-structured interviews was carried out with a phenomenological approach. First, each member of the research team analyzed the data separately by reading through the interview answers several times to draw out common ideas and concepts. Next, themes and subcategories were formulated. After individual analysis, researchers met together to decide mutually on final themes and subcategories.

### **Quantitative Data Analysis**

Quantitative methods included a comparison of pre- and post-outcome measure data of the participants and analysis of baseline outcome measure data of all subjects who completed the consent process. Statistical analysis of demographics was taken as well, such as the average age of subjects and distribution of genders.

## Chapter IV: RESULTS

While many residents showed interest in an exercise program, only twelve completed the informed consent form (see Figure 1). Of those twelve, eight completed all baseline outcome measures including the GPPAQ, FTSST, and the WHOQOL-BREF. Of those eight subjects, three participated in the exercise program and attended post program semi-structured interviews. All three of the individuals participated in the second exercise session. None of the subjects participated in the other five sessions. Two of the subjects that participated were female while one was male. The average age of the eight who completed the baseline outcome measures was 53 +/- 15.2 years of age, while the average age of the three who participated was 48.3 +/- 15.6 years of age. Although the target audience for this study was the elderly immigrant Somali population, only one Somali immigrant participated and one of the three participants was the age of 65, or classified as “elderly”. The other two participants were born in the United States and were ages 34 and 46. Although it was offered to the eight non-participants, post-program outcome measure data was not collected on any of these individuals.

After the six months of sessions, all three subjects were reassessed with the same outcome measures as well as the semi-structured interviews. As there were no significant changes in the outcome measures of the three participants pre and post-intervention, no further calculations were taken to

determine effect and response. There was no significant difference between baseline of participants vs. non-participants in any of the measures as well.

A comparison of the FTSST pre and post-program measures are shown in Figure 2. Two subjects improved their FTSST scores, while one subject declined (See Table 2). On average the three participants performed the FTSST faster than the eight non-participants (See Figure 3).

Comparing pre to post-outcome measures on the GPPAQ, one person listed activity level as the same as before the exercise session, while two reported that they were more active (See Table 3). Only two non-participants rated themselves as inactive compared to all three participants rating themselves as such at baseline. All other non-participants rated themselves as moderately inactive to active.

The average participant scored better than the average non-participant on the baseline measures of physical, social, and environmental domains of the WHOQOL-BREF, while the average non-participant scored higher on the social domain (Figure 4). Two of the three participants completed the baseline measure for the social domain while three of the five non-participants completed the same domain. On the physical domain and the psychological domain of the WHOQOL-BREF, one participant's score declined comparing pre to post-intervention, and two participants' scores improved. Only one person completed both pre and post-program measures for the social domain of the WHOQOL-BREF, and the subject scored the same on both. Another

subject completed the pre-program social domain but declined to complete the post-program social domain questions. The other subject did not complete pre or post- program measures of the same domain. All three subjects decreased their scores on the environmental domain of the WHOQOL-BREF. See Table 4 and Figure 5 for details.

Several themes emerged from the semi-structured interviews conducted. The themes included a value of physical activity, logistical considerations, and barriers to participating in the exercise program. From those themes, subcategories were formed. First, for the theme of a value of physical activity, we found that each participant thought that staying active and exercising was important. One participant responded that they chose to participate simply “for the exercise”. Another stated that his/her purpose for participating was to lose weight. All responses demonstrated the participants’ value of staying active, exercising, and maintaining a healthy weight.

The next theme of logistical considerations had subcategories of timing, frequency, content, and communication. All these aspects were shown to be important to developing a good exercise program for the participants. The first subcategory of timing referred to the time of day and days of the week the program was offered. One respondent stated they would participate “any time except during football” and another stated, “morning sessions would have been better” than the afternoon sessions that were offered. The next subcategory of frequency referred to how often the program should be

offered. One participant quoted that they would have preferred the program to be offered once per week for six weeks total. Another stated they wished the program could have been offered longer than six months. The next subcategory of content included quotes from participants indicating they enjoyed the educational components and specific activities performed during the exercise sessions. However, another stated that they disliked “going down on the floor” for some of the exercises. The last subcategory of communication referred to how the research team, administration, and participants communicated with one another. One participant noted, “I thought it (the sessions) was on resident meeting days” when asked what they disliked about the program.

The final theme was barriers to participation with subcategories of procedural requirements and life events. The category of procedural requirements emerged from quotes such as “I wish we weren’t ‘guinea pigs’ and need doctor’s forms”. The barrier of life events came from participants stating they could not participate in certain sessions due to appointments, family emergencies, and medical procedures. Once data was collected and themes emerged, discussion and reflection took place around what the results from the quantitative and qualitative data meant for this study and future programming.

## **Chapter V: DISCUSSION**

The purpose of this study was to determine the effect of an organized exercise program on an elderly minority population, specifically Somali immigrants. Best practices from the existing literature helped shape the general structure of this exercise program. These included providing educational and physical components, providing the program on-site and indoors, at no cost, led by an instructor, and having basic exercises targeting endurance, strength, balance, and flexibility without complex equipment. Various studies investigated similar themes and found positive physical and emotional effects of exercise programs targeted at minority populations.

Despite addressing many of the barriers discussed in the literature there was a low number of participants, and therefore statistical analysis was not indicated and conclusions could not be drawn from the data collected. Such low participation was unexpected but potential contributing factors include: program frequency and timing, participation requirements, specifically the medical clearance form, and communication barriers. One factor could have been holding sessions once a month. This could have made the sessions less desirable and difficult to remember, despite marked calendars being provided to all who showed initial interest. Sessions were held in the afternoon when participants might have had prior appointments and responsibilities. Another likely factor was the need for a medical clearance form with physician's signature. Although this requirement was introduced at

the first recruitment session, transportation, and other unforeseen barriers may have limited subjects' ability or desire to meet with a physician in order to obtain a signature. The majority of subjects who showed initial interest spoke little to no English. Although an interpreter was secured for translation she was not always immediately available. This could have led to miscommunication and possibly frustration. Participation requirements or session dates and timing may have not been fully understood. Interestingly logistical factors such as the medical clearance form and communication barriers were not frequently mentioned in previous literature working with immigrant populations. In contrast, having time available to exercise is one of the most commonly stated perceived barriers in the literature reviewed and very likely influenced participation in this study.<sup>28,29,31,32</sup>

### **Outcome measure results**

Participants completed their initial FTSST faster than non-participants. The average of participants' initial FTSST scores were below the 13.6 second norm established by Guralnik et al.<sup>39</sup> This norm indicates increased disability and morbidity in subjects that take longer than 13.6 sec to complete the test. The non-participant group initial average was greater than 13.6 seconds, possibly indicating those who chose to participate had a certain level of physical ability, which could contribute to higher self-efficacy.

All three participants labeled themselves as inactive on the initial



GPPAQ, showing a possible trend of participation by those who felt a need for exercise in their lives. The GPPAQ is not intended to be used following interventions, but rather to track physical activity over longer periods of time. The change in GPPAQ scores for participants from inactive to active was attributed to the differences in time of year the measure was conducted; initial in the winter, final in the summer. No significant changes were found from the WHOQOL-BREF data. Initial scores of participants were higher in three categories but overall similar. No change was noted between pre and post-program scores for participants. Participants were on average younger than non participants and had higher initial scores on both the FTSST and WHOQOL-BREF, possibly relating to the published literature stating individuals that are more likely to participate in exercise programs have higher self-efficacy.<sup>22,29</sup>

### **Interview results**

Qualitative data drawn from the semi-structured interviews with participants provides insight into participation and satisfaction. The theme of an overall value of physical activity was communicated through participants and also consistent with an initial high level of interest from the target community, with many residents signing consent forms. Though there was high initial interest there was low participation. The theme of program logistics reflected time and frequency as most likely reasons for the low numbers, as

participants spoke positively of program content. The theme of barriers added to possible reasons for low participation suggesting other events in participants' lives took priority over the program.

The collected data is consistent with the literature stating that minority populations desire to be more physically active, yet may be limited by resources and self efficacy. In general studies showed great success with participation. Despite efforts to overcome the known and stated barriers by having an organized, free, close proximity, instructor-led course with interpretation services available, participation was low.

### **Limitations**

Future studies should consider known barriers and facilitators to exercise for minority populations and make their programs as culturally tailored as possible. Also to be considered are logistical factors such as timing, frequency, and content to encourage participation when working in a community setting.

A major limitation for this study was the low participation. With such few participants only attending one session no conclusions could be drawn from the outcome measures used, saturation was not reached with semi-structured interviews, and comparisons between participants and nonparticipants was not possible because post-program data was collected from participants only. In turn, the low participation may have been influenced

by several factors. Time was an additional limitation. More time might have allowed additional subjects to obtain a doctor's signature on the medical clearance form. Having time for a more frequent program may have increased participation, as the researchers' schedules limited the frequency of the program to once per month. Additionally, the GPPAQ is not designed to show change after an intervention, but rather re-assessed over time, specifically over one year. In this study it was re-administered after 6 months. Finally, the support from building management appeared to decline over the course of the six months, also potentially having a negative influence on participation.

## **Chapter VI: CONCLUSION**

In conclusion, the benefits of exercise and the higher risk of inactivity in immigrant and minority populations is well documented. Previous studies conducting similar investigations were factored into the development of the above described program, and despite a high initial interest in an exercise program provided for residents in a subsidized housing facility, participation in the offered exercise sessions was low. This unanticipated low participation limited analysis of activity level, quality of life, and functional strength outcomes. However, baseline data seemed to indicate that participants appeared to be younger and having higher functional strength than non participants. Therefore, they possibly had greater perceived ability to participate than nonparticipants. Qualitative outcomes demonstrated that participants value physical activity, but program timing and content should be carefully considered prior to initiation of future programming. These findings, though not statistically significant are consistent with previous literature, emphasizing the importance of specifying exercise program logistics to the target population to encourage participation.

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## **TABLES**

Table 1. Interview Questions Participants Were Asked Following the End of the Exercise Program.

Number	Question
1	Why did you participate in this program?
2	What did you like about the exercise program?
3	What didn't you like?
4	Do you think the exercise program increased your physical activity?
5	Were the education sessions easy to understand?
6	Were you able to make it to all the sessions you wanted to? If not, what kept you from attending?
7	What would you suggest for exercise groups in the future?

Table 2. Five Times Sit to Stand Times by the 3 Participants Taken Pre and Post-Exercise Program.

<b>Five Times Sit to Stand</b>		
<b>Subjects</b>	<b>Pre</b>	<b>Post</b>
1	9.57 seconds	9.11 seconds
2	20.25 seconds	19.67 seconds
3	8.9 seconds	10.74 seconds

Table 3. GPPAQ Scores for all Subjects Ordered by Pre and Post Exercise Program Including Participants and Non-Participants.

<b>GPPAQ</b>		
<b>Subjects</b>	<b>Baseline</b>	<b>Post-Program</b>
1. (participant)	Inactive	Inactive
2 (participant)	Inactive	Moderately Inactive
3 (participant)	Inactive	Active
4 (non part)	Inactive	No Data
5 (non part)	Inactive	No Data
6 (non part)	Moderately Inactive	No Data
7 (non part)	Moderately Inactive	No Data
8 (non part)	Active	No Data

Table 4. WHOQOL-Bref Scores for the 3 Participants Divided into Pre and Post Exercise Program and Further into Individual Domains.

<b>Subjects</b>	<b>WHOQOL</b>				<b>BREF</b>			
	<b>Pre</b>				<b>Post</b>			
	<b>Physical</b>	<b>Psyc</b>	<b>Social</b>	<b>Environment</b>	<b>Physical</b>	<b>Psyc</b>	<b>Social</b>	<b>Environment</b>
1	66.7	50	66.7	31.3	25	58.3	NS	3.1
2	57.1	70.8	75	84.4	64.3	79.2	75	65.6
3	57.1	95.8	NS	84.4	82.1	66.7	NS	81.3

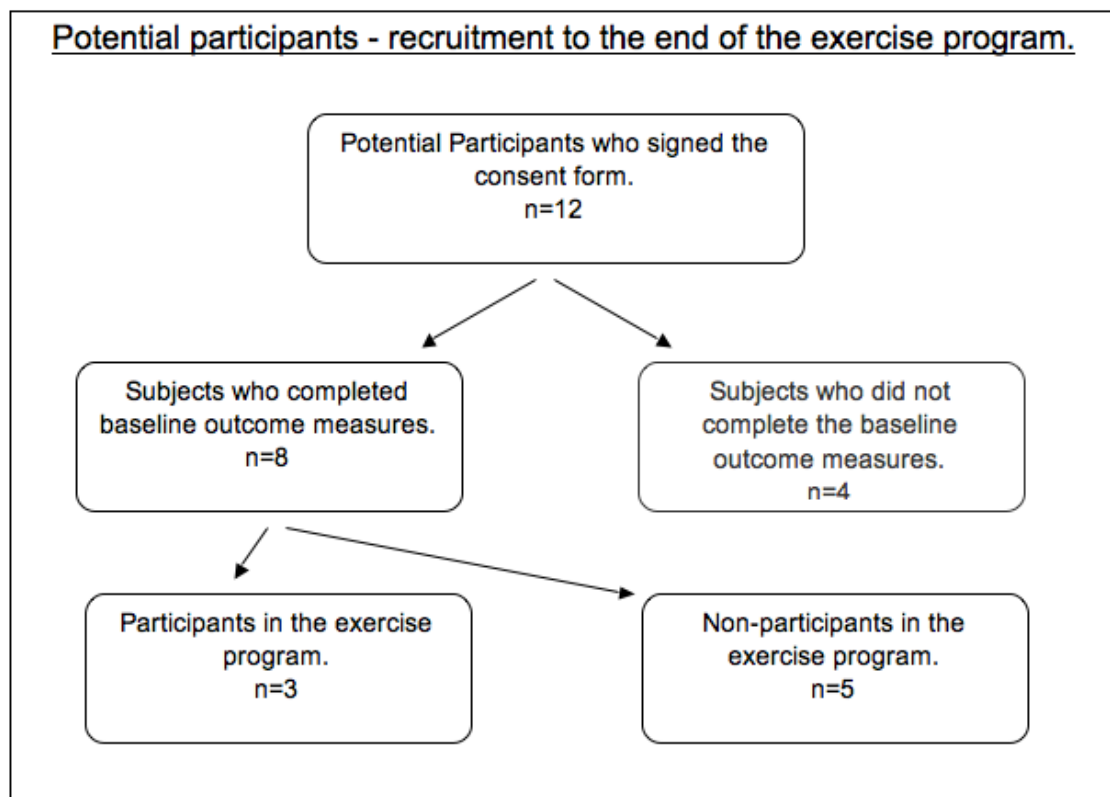
**FIGURES**

Figure 1. The number of potential participants at each step of the process from recruiting subjects, until the final the exercise session.

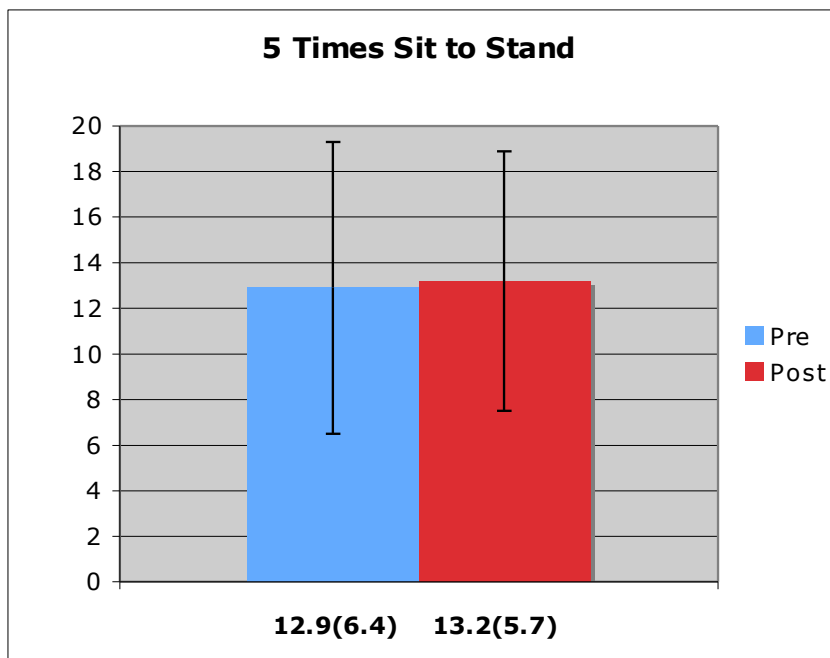


Figure 2. Comparison of the average pre and post exercise program measures of the 5 Times Sit to Stand for the 3 participants.

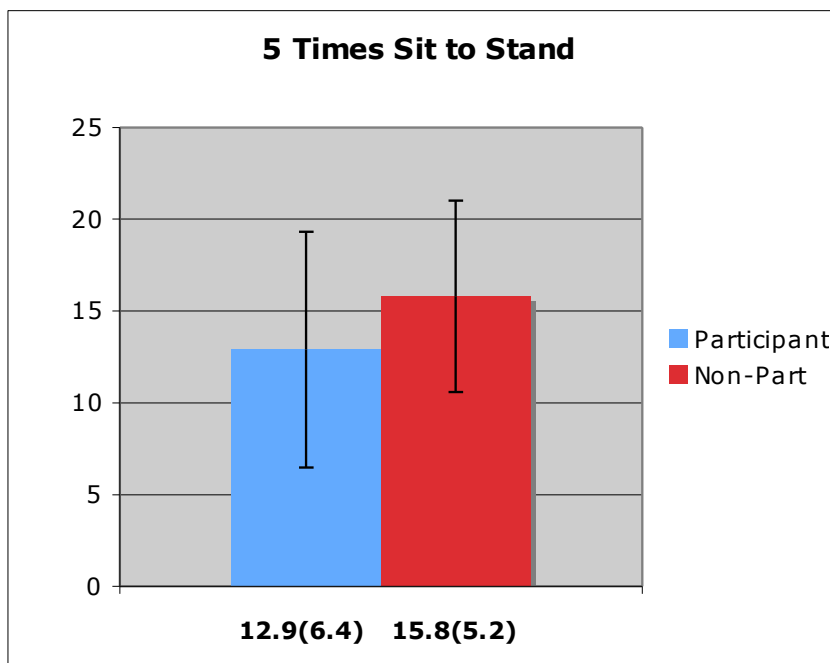


Figure 3. Comparison of the average baseline scores of 5 Times Sit to Stand between participants and non-participants.

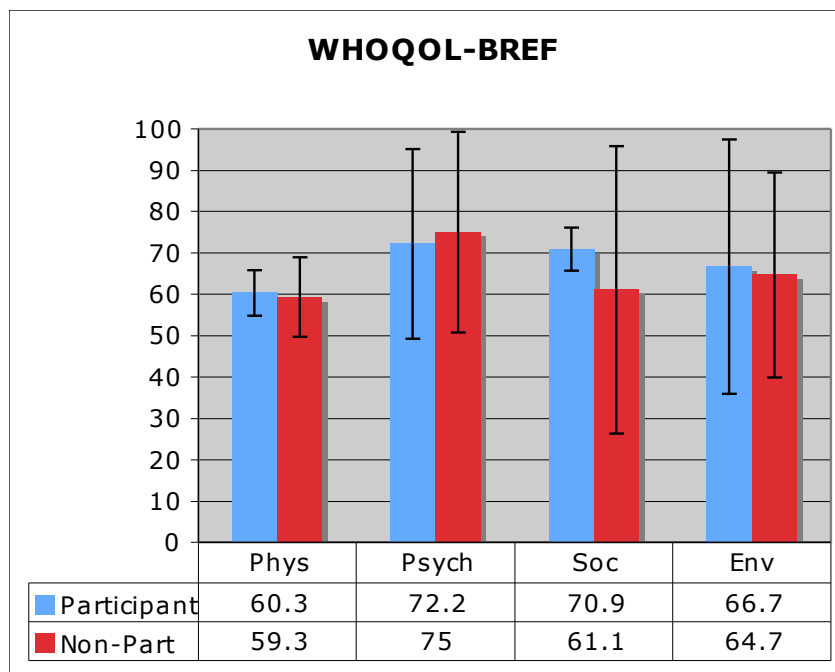


Figure 4. Comparison of average baseline WHOQOL-BREF scores between participants and non-participants.

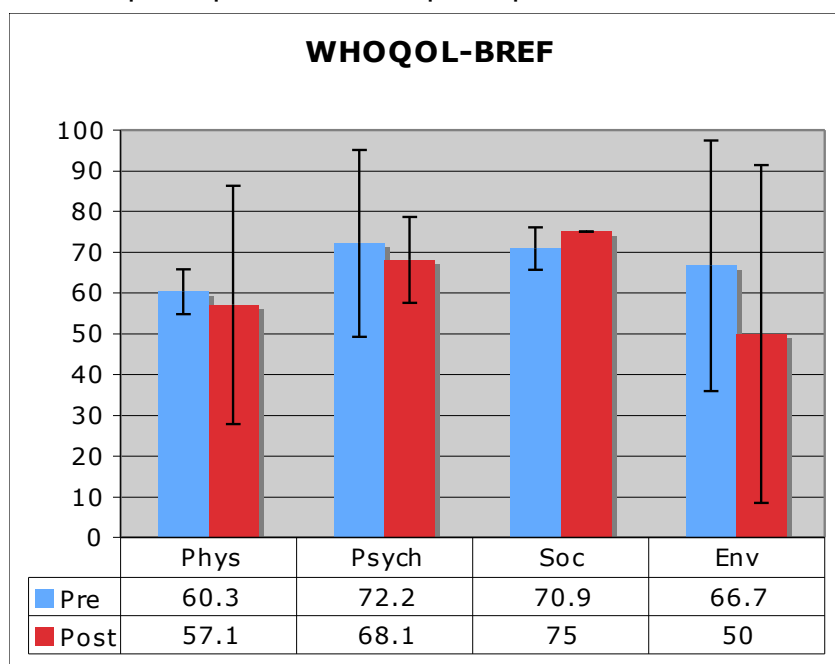


Figure 5. Comparison of average WHOQOL-BREF scores taken pre and post exercise program by the participants.