

Impact of a Pilot Adaptive Sports Intervention on Residents at a Skilled Nursing Facility



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Abstract

The purpose of this pilot study was to measure the impact of an adaptive sports intervention on several outcomes including the components of self-determination (i.e., autonomy, competence, relatedness), loneliness, and mobility for residents of a skilled nursing facility (SNFs). This study employed a physician-prescribed, 4-week adaptive sports intervention specifically adapted for the residents of a SNF. The program was administered by Certified Therapeutic Recreation Specialists® (CTRS), and facilitated six participants in weekly practice (basketball, baseball, golf, shuffleboard) and competition against residents in other local facilities. This mixed-methods study employed pre-test/post-test outcome evaluation using the UCLA Loneliness Scale, Basic Psychological Needs Satisfaction Scale (BPNSS) (competence, autonomy, relatedness), Timed Up and Go Test, as well as structured qualitative interviews. Results of this study showed improvements for all participants across most or all cognitive, physical, emotional, and/or social domains and all measures showed positive movement. Results also suggested improvements in identity, belonging, importance, and the potential for transfer of these benefits to greater

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social engagement, lower fall risk, and decreased depression. Practical recommendations are provided. In addition, replication and expansion of this design is warranted.

Keywords

Adaptive sports, long-term care, older adult, recreation therapy, self-determination, skilled nursing facility

According to the Centers for Disease Control, in 2016, approximately 1.3 million individuals resided in skilled nursing facilities (SNFs) in the United States and will likely call this new environment home for the rest of their lives (U.S. Department of Health and Human Services [HHS], Centers for Disease Control [CDC], National Center for Health Statistics [NCHS], 2019). By 2030, approximately 2.3 million older adults will require the assistance provided by SNFs (Mather, 2016). This influx is largely due to medical advances contributing to longer life spans, and, in particular, the aging baby boomer generation (Markson & Stein, 2012). Yet, qualitative studies report that the move to a SNF often requires residents to sacrifice not only familiar surroundings and routines, but also many aspects of their values and identities, including relationships, community engagement, and meaningful leisure participation (Coughlan & Ward, 2007; Heliker & Scholler-Jaquis, 2006; Tsai & Tsai, 2008).

Recreation and leisure have been illuminated as unique opportunities to promote identity and dignity for older adults in SNFs; however, recent research also upholds that the potential for positive impact relies on the ability of practitioners to cater leisure experiences to individual preferences and to enable residents to actively participate (Slettebo et al., 2017). As baby boomers age and are admitted to SNFs with unique characteristics and needs, recreation therapy (RT) offers services to fulfill the need for purpose, skill development, identify fulfillment, and holistic health outcomes through individualized, innovative programming. This incoming generation often exhibits goal-directed, competitive, and work-centric characteristics, signaling a need for leisure opportunities that offer opportunities for challenge, purpose, and cognitive stimulation (Cochran, Rothschild, & Rudick, 2009). Thus, long-term care facilities should not maintain a static model, but, rather, should constantly evolve to become more responsive to the preferences of older adults and to promote healthy aging through influencing social, lifestyle, and environmental factors (Knickman & Snell, 2002). Adaptive sports may be an optimal intervention to address these areas of need and challenge the status quo of older adult programming.

Background and Literature Review

Impacts of LTC Residence on Health and Well Being

Although individuals typically admit to long-term care (LTC) to address needs of safety and health due to physical and/or cognitive impairment, residents in assisted and skilled nursing environments often experience barriers to crucial life elements that were foundational contributors to their health prior to admission. Although a SNF residence offers valuable and specialized care, this new phase of life can have negative effects on older adults who leave familiar communities and realize the functional declines that contributed to this lifestyle change. For example, research indicates that

some residents of SNFs may feel a loss of independence, loneliness, isolation, and decreased confidence, resulting in negative self-image (Cornwell & Waite, 2009; Philippe & Vallerand, 2008). Similarly, in a study of older adults who transitioned into a SNF, Riedl, Mantovan, and Them (2013) found that the stress of this adjustment negatively impacted all health domains. Interviews revealed that key elements (i.e., social status, social contact, autonomy, habitual activities), which “up until this [transition] point [had] formed this persons’ identity” (p. 7), were challenged by this transition.

Loneliness and social isolation. A meta-analysis of loneliness in older adults identified that older adults living in a SNF experienced higher loneliness than those living in the general community (Pinquart & Sorensen, 2001). Authors found that the quality of relationships had a stronger correlation with decreased loneliness than number of social contacts. Thus, although SNFs offer ample opportunity for day-to-day interactions, meaningful friendship is more important for reducing loneliness yet is often less accessible. Furthermore, results indicated that relationships with friends were more likely to reduce loneliness than those with family members. This highlights a profound shift in the key players in residents’ lives. More often than not, family members have been the major positive influences on loneliness in older adults’ prior routines. As residents begin to share their life space with new peers, it is reasonable to assume that these neighbors might now play a significant role in impacting their well-being and happiness, underscoring the importance of facilitating relationships between residents in LTC.

Jansson et al. (2017) found that 36% of LTC residents felt lonely at least some of the time, determining that those who were less lonely were more independent in mobility and less depressed. The problem thereby compounds itself, as loneliness can largely contribute to depression. Nicholson’s (2009) concept of social isolation reads, “a state in which the individual lacks a sense of belonging socially, lacks engagement with others, has minimal number of social contacts and is deficient in fulfilling and quality relationships” (p. 1346). Some of the antecedents to social isolation identified in this study include lack of relationships, psychological barriers, physical barriers, and a prohibitive environment. SNFs inherently remove an individual from their home environment, diminish their sense of independence, challenge their emotional well-being, and limit their outside interactions. In the absence of independence and relational opportunities, loneliness and social isolation can lead to cognitive decline, negative health repercussions and has even been linked to mortality (Jansson et al., 2017; Nicholson, 2009).

In a meta-ethnographic synthesis of the “meaning of home” for individuals transitioning to LTC, Mahony (2010) identified that being known to and knowing others, having a “defined role,” and “feelings of empowerment,” helped to “distinguish home and not home” (p. 303). Therefore, loneliness and social isolation not only hinder psychosocial well-being, but also impede acceptance of the long-term nature of their admission to this environment.

Self-determination theory. Self-determination theory (SDT) encompasses many of the need areas threatened by admission to LTC. In this theory, Deci and Ryan (2000) posit that there are the three basic psychological needs of autonomy, competence, and relatedness that must be met to facilitate an individual’s growth and development. *Autonomy* refers to the operation of an internal locus of control that empowers an individual to feel in control of his or her decisions; *competence* refers to individuals’ sense of mastery of their environment, especially tasks that are important to them; *related-*

ness refers to the extent to which a person feels connected and cared about by others (Deci & Ryan, 2000) (*italics added*). According to the authors, these three needs must be continually satisfied for people to develop and function in healthy or optimal ways (Deci & Ryan, 2000). Inevitably influenced by lifestyle factors, these components can be negatively impacted by admission to LTC, particularly due to losses in independence, personal choice, and social life (Philippe & Vallerand, 2008).

SDT has been described in the literature as a suitable framework to investigate older adult motivations, behaviors, physical activity, and adjustment to LTC. In fact, self-determined motivations have been linked to psychological adjustment in LTC settings when residents are able to exert control over decisions, preserve autonomy as much as possible, and retain meaningful relationships (Brownie, Hortsmanshof, & Garbutt, 2014). Jansen et al. (2018) found that autonomy, in particular, contributed to individuals' "ability to overcome environmental barriers," nurture social interactions, receive attention from staff, have "newly established social contacts," and have "more frequent occasions for pleasant and emotionally meaningful encounters" (p. 985). Staff can aid in the transition and maintenance of these needs through offering opportunities for self-expression and through promoting an understanding of each resident's needs. Additional studies suggested that when basic psychological needs are satisfied, older adults behave with increased initiation and persistence, particularly in studies involving exercise or physical activity (De Pero et al., 2009; Kirkland, Karlin, Stellino, & Pulos, 2011). Riedl et al. (2013) identified an additional facilitator of met needs in meaningful leisure, underlining its importance to autonomy maintenance and identity stabilization.

Lack of meaningful leisure and physical activity. Meaningful leisure is an ideal outlet to foster relationships and to facilitate autonomy and competence, as this type of activity typically promotes free expression and is purposeful, intrinsically motivated, and personally rewarding (Webb & Karlis, 2017). Meaningful leisure has also been established as a determinant of successful aging (Pruchno, Wilson-Genderson, & Cartwright, 2010). Specifically, meaningful leisure pursuits have been associated with health outcomes in all domains (cognitive, emotional, physical, social, spiritual). In a study of 200 older adults living in a rehabilitation facility, Merims, Ben Natan, and Seleznev (2018) noted that, "what matters to the individual's well-being is the meaning or perceived quality of the leisure activity rather than the type of activity" (p. 210) directly relating meaningful leisure to rehabilitation outcomes.

Through recreation therapy interventions, Certified Therapeutic Recreation Specialists® (CTRSs) offer physician-ordered, goal-directed opportunities for meaningful leisure that are guided by client choice. These 1:1 and small group interventions cater directly to an individual's abilities and needs to promote functional health outcomes. When attempting to provide increased opportunities for personally meaningful leisure in LTC, this type of individualized attention is crucial to the success of a program.

For many, a quintessential proponent of leisure participation throughout the lifespan is physical activity. Physical activity has been linked to positive health benefits in all domains, including reduced depressive symptoms, improved functional mobility, decreased fall risk, increased socialization, and improved overall quality of life (e.g., Diegelmann et al., 2018; Fern, 2009; Jansen et al., 2018; Koskela et al., 2018; McPhee et al., 2016). Challenges arise, however, that compromise adequate provision of these types of services.

A review of the literature on obstacles to physical activity in LTC revealed barriers at three levels: resident (e.g., health status, fear, anxiety), environmental (e.g., lack of space), and organizational (e.g., lack of staffing and funding for program development/support) (Benjamin, Edwards, Ploeg, & Legault, 2014). Specifically, this study highlighted the substantial range of physical abilities that often exists among residents, describing contrasting opinions on exercise programs. Although some residents did not attend exercise programming due to fear that they could not adequately participate, others stated not feeling challenged enough or feeling bored (Benjamin, et al., 2011; Guerin, Mackintosh, & Fryer, 2008). The authors emphasized the need to consult participants to guide program structure.

Sport as a Therapeutic Intervention

Recreation therapists often aim to reunite older adults with prior leisure interests. Current research also supports novel experiences for cognitive outcomes and overall enjoyment. These studies suppose that sustained engagement in mentally stimulating, unfamiliar leisure augments functional memory skills and promotes neuroplasticity in older adulthood more so than familiar tasks (Buitenweg, Murre, & Ridderinkhof, 2012; Park, et al., 2013). Similarly, Labban, and Etnier (2018) established that even short-term exercise can benefit elements of memory and cognition. RTs can challenge stigmas of inactivity and monotony often associated with older adult settings to promote health through familiar and unfamiliar tasks (Genoe & White, 2015).

Adaptive sports can provide a novel opportunity in an unsuspecting setting. Typically found in settings serving youth and young adults with physical disabilities, adaptive sports have been shown to positively influence quality of life, overall health, quality of social life, acceptance of disability, and development of an athletic identity (e.g., Lape et al., 2018; Spornier et al., 2009; Zabriskie, Lundberg, & Groff, 2005). Yet, literature also denotes the physical, social, and emotional benefits of sports for older adults. Qualitative interviews conducted with senior sports teams revealed subjectively perceived benefits such as fostered social relationships, increased sense of community, improved self-image, and increased opportunities for enjoyable and purposeful physical activity (Dionigi, Horton, & Baker, 2011; Heo, Culp, Yamada, & Won, 2012; Lyons & Dionigi, 2007; Martin, Warner, & Das, 2016). Consistent with older adult literature grounded in SDT, studies regarding older adult sports involvement suggested athletes typically participate in pursuit of social belongingness as well as social meanings through activities (e.g., Heo et al., 2012; Kelley, Little, Lee, Birendra, & Henderson, 2014). Additional studies examining first-hand accounts of sport-participating older adults revealed that these senior athletes were also drawn to competition and simultaneous resistance to and acceptance of aging (Dionigi, Horton, & Baker, 2011; Muiños & Ballesteros, 2015).

Although these studies provide compelling evidence for the benefits of sports for older adults, this research is generally limited to participants without physical limitations and often centers on highly competitive senior games. There is a distinct lack of research on the impact of sports participation for older adults in LTC settings. In addition, within the field of RT, there is little evidence to demonstrate the effectiveness of programs that address the issues related to transitioning to LTC, such as loneliness and isolation (Rozek & Richeson, 2016). Therefore, the purpose of this study was to design and measure the impact of a pilot adaptive sports intervention, grounded in SDT, on

four domains of individuals residing in a skilled nursing facility in the southeastern United States. Specifically, the research questions for this study were:

1. Does participation in a 4-week RT-based adaptive sports program improve the status psychological needs (autonomy, competence, and relatedness) in older adults residing in a SNF?
2. Does participation in a 4-week RT-based adaptive sports program affect loneliness in older adults residing in a SNF?
3. Does participation in a 4-week RT-based adaptive sports program improve mobility in older adults residing in a SNF?

Methods

Research Design

This pilot study employed a mixed-methods design to help researchers gain a full understanding of the participants' experience in the adaptive sports program intervention. Mixed-methods design collects and analyzes both quantitative and qualitative data separately and then merges results from both collection methods to allow integration of findings in effort to help to fill gaps that might exist if only one method were used. Specifically, for this study, researchers applied the concurrent parallel type of a mixed-methods design (Creswell & Plano Clark, 2011) to facilitate defining the relationship among variables. In this type of mixed-methods application, quantitative and qualitative data are prioritized equally and are collected and analyzed separately but concurrently. Subsequently, results were compared and integrated into an overall interpretation of the experiences of the participants. This design was chosen for this study because of the evaluative nature of the study.

The program was designed, implemented, and evaluated by the CTRs at the agency in which the participants lived. The lead recreation therapist reached out to faculty at the university involved to assist in the data collection and analysis. Faculty received IRB approval for secondary data analysis. All data were de-identified.

Participants

A convenience sample of participants was used for this pilot study. Participants were residents in a 117-bed SNF in Southeastern U.S. Just under half ($n=51$) of the beds at this agency were classified as LTC. Recruitment of participants consisted of several focus groups hosted by RT staff for any residents that had interest in a sports program. Inclusion criteria for the study aimed to address the issues of social isolation and lack of meaningful involvement in residents with higher cognitive functioning. Therefore, all potential participants were administered the Mini-Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975) to identify participants who would qualify for the actual team and eligibility for this study was delimited to a score of 24 or above. Rationale for the delimitation was three-fold. First, the majority of research about older adults and sports addressed individuals in community settings and without cognitive impairments (e.g., Dionigi et al., 2011; Heo et al., 2012; Lyons & Dionigi, 2007; Martin, Warner, & Das, 2016). Therefore, considering the novelty of an adaptive sports program in a SNF, researchers selected participants with high cognitive functioning to be consistent with the established literature. Second, staff identified that

higher functioning residents often felt out of place being integrated with other lower functioning residents, consistent with issues of social isolation and lack of meaningful involvement presented in the literature. Finally, researchers deemed it important that the participants not only be able to acquire new skills, but also maintain investment, remember the adaptive sports experience, and form relationships with peers who have similar levels of cognitive functioning. Following MMSE score collection, seven residents met this criterion. One declined to participate, thus the final convenient sample comprised the remaining six who agreed to participate in the pilot program. RT staff then obtained physician orders for residents to participate in a 4-week, RT-based adaptive sports program. In addition, informed consent included signed consent forms from all participants acknowledging that their participation was part of a research study, but also families were notified to assure agreement on their parts.

At the time of the study, all participants used wheelchairs for mobility; all but one was able to propel themselves, while one required assistance due to a visual impairment. All participants were able to stand/ambulate with a walker, requiring varying levels of assistance. In addition, all participants, save one, received restorative walking services through RT consistently prior to and during the intervention. The participant who did not receive walking services participated in balance programs conducted by RT twice each week, also prior to and during the intervention.

Intervention/Program

The pilot intervention consisted of four sports (shuffleboard, basketball, golf, baseball) selected by the residents participating in the program. A different sport was scheduled for each of the four weeks, specifically intended to progressively increase in difficulty to promote feelings of competence. Each week consisted of 1-hour practices twice weekly and a Friday competition against residents of other local senior living facilities. Frequency and duration were established in an attempt to provide the recommended amount of exercise as defined by the U.S. Department of Health and Human Services [HHS] (2018) to include 150 minutes of moderate physical activity or 75-150 minutes of vigorous intensity physical activity. The other facilities were chosen specifically for convenience, availability, and location in order to promote feelings of connection with their local community. Two CTRSs and two RT student interns led practices, creating a 4:6 therapist-to-client ratio. All participants received the option to practice each sport standing with a walker/supervision or sitting in wheelchair. One athlete occasionally elected to participate while standing, yet primarily practiced and competed from wheelchair level. An in-depth literature review on sport adaptations and Special Olympics[®] competition guidelines directed protocol design for practices. In addition, the tenets of the Leisure Ability Model (LAM; Stumbo & Peterson, 1998), and the elements of the SDT (Ryan & Deci, 2000) were used to establish the philosophy and culture of this program. Per the principles of the LAM, participants typically began with a focus on improving functional behaviors, guided primarily by the therapist (functional intervention). The development of skills, attitudes, and knowledge (leisure education) prepared participants for subsequent independent recreation participation. Thus, structured coaching by the RTs provided the most assistance and instruction during the first practice (functional intervention), stepping back to nurture and empower individual strategy and skill development in the second practice (leisure education). Finally, competition days facilitated independent game play (recreation participation).

In addition, based on SDT literature relating to older adults and physical activity, RT coaches implemented intentional techniques to promote psychological need fulfillment. This included, but was not limited to, offering maximum opportunities for choice (*autonomy*), encouraging appropriate goals and challenges (*perceived competence*), and nurturing a social environment based upon individual preferences (*relatedness*) (Kirkland et al., 2011; Vansteenkiste, Simons, Soenens, & Lens, 2004). Therefore, participants were encouraged to communicate with and support teammates inside and outside of practice, actively participate in team decision making at post-practice debriefs, independently recall weekly schedules, personally invest in acquiring and applying skills, and practice/compete as independently as possible. Utilizing recommendations from adaptive sports literature, each sport was designed to provide the optimal challenge and opportunities for success, considering each participant's specific limitations. Adaptations were made to equipment and modifications made to competition design, accordingly. Family and friends, as well as residents from each community, participated as spectators on competition days.

To achieve consistency in program delivery, all RT coaches contributed to protocol development and application. Coaches established roles and utilized printed copies of protocols for each sport instruction.

Instruments/Measures

As a measure of delimitation, participants were administered the MMSE (Folstein, Folstein, & McHugh, 1975) to determine cognitive eligibility to participate in the program. The MMSE is an 11-question exam that is broken into two sections, a verbal response and written response, that measures the severity of cognitive impairment. The maximum score on the first section is 21 and the max score on the second section is 9, making the total max score 30. A score of 24 points (out of 30) indicates a lack of cognitive impairment. Below this, scores can indicate severe (≤ 9 points), moderate (10–18 points) or mild (19–23 points) cognitive impairment. Internal consistency (test-retest reliability) was .89.

The mixed-methods concurrent parallel design used a one group pre- and post-program data collection. Both quantitative instruments and interview guides were chosen and designed to solicit information on the participants' perceptions of loneliness, autonomy, competence, relatedness, as well as status of balance, mobility, and fall risk. Pre-program data were collected from participants through three quantitative surveys (UCLA Loneliness Scale, Basic Psychological Needs Satisfaction in General Scale, Timed Up and Go Test) as well as face-to-face qualitative structured interviews. RT staff administered all surveys and interviews verbally, and typed paper copies provided visual cues as participants desired or needed. For example, participants could read the responses, "Never feel this way," "Rarely feel this way," etc. on the paper copies. In addition to therapists' field notes, the interviews were tape recorded and transcribed verbatim.

The UCLA Loneliness Scale (Russell, Peplau, & Ferguson, 1978) is a 20-item scale designed to measure one's subjective feelings of loneliness, as well as feelings of social isolation. Participants rated each item as O ("I often feel this way"), S ("I sometimes feel this way"), R ("I rarely feel this way"), or N ("I never feel this way"). Scores below 15 indicate low or minimal loneliness, scores between 15–20 indicate average loneliness, scores between 21–30 indicate frequent loneliness, and scores between 31–40 indicate severe loneliness. The instrument demonstrated high reliability with scores of internal

consistency ranging from .89 to .94, and $r = .73$ for test-retest reliability.

The Basic Psychological Needs Satisfaction Scale (BPNSS; Deci & Ryan, 2000) is a 21-item scale that measures an individual's psychological needs for autonomy (7 items, e.g., "I feel like I am free to decide for myself how to live my life"), competence (6 items, e.g., "Most days I feel a sense of accomplishment from what I do"), and relatedness (8 items, e.g., "People in my life care about me"). A 7-point Likert-type scale was used where 1 represented "not at all true," and 7 was "very true." Internal consistency reliability for the composite scale was $\alpha = .86$.

Finally, all participants were administered the Timed Up and Go (TUG) test (Podsiadlo & Richardson, 1991). This test is designed to measure a patient's mobility, specifically by assessing balance and fall risk. Participants are observed and timed as they rise out of a chair, walk 10 feet, turn, walk back, and sit down again. A participant who takes 12 or more seconds to complete the TUG is identified as at risk for falling. The Cronbach alpha was .96 and the ABC test-retest correlation was .92.

In addition, to implement the second phase of a concurrent parallel type of mixed-methods design, researchers conducted structured qualitative interviews prior to and post intervention. An extensive literature review on the SDT (competence, relatedness, autonomy), perseverance, learned helplessness, quality of life, competition, and loneliness served to develop interview questions. In addition, as part of the interview, participants ranked the four domain areas of functioning that they expected to change as a result of the pilot program, from those most to least expected to change. Five expert professionals working with older adults in RT critiqued the interview guide, and researchers revised accordingly.

Data Collection

Data were collected on the six measures through both surveys, as well as through 20-30 minute structured, 1:1 interviews. With the exception of the MMSE, all pre-test surveys were administered individually one to two days before the beginning of the first practice. Post-test surveys were similarly administered one to two days after the completion of the fourth week of the program. In addition, the program facilitators administered the interviews face to face to the same participants before and after program implementation in a private, comfortable environment, providing prompting as needed. Prior to interviewing, all interviewers met to discuss interviewing techniques and to streamline the interviewing process for consistency. Interviewers utilized the same probes for clarification if needed and aimed to avoid providing feedback in response to resident answers. All interviews were audio recorded for accuracy and transcribed verbatim. In addition, researcher field notes were collected for each athlete immediately following practices and competitions. All data analysis procedures received IRB approval.

Data Analysis

Descriptive and comparative analyses were used to determine changes from pre-test to post-test scores for the quantitative data. Specifically, paired differences of raw data were compiled, as well as a composite percent change per variable.

Qualitative data analysis consisted of transcribing interviews, coding data, and analyzing to identify themes and patterns that emerged from the data (Creswell & Plano Clark, 2011). First, a summary of comments for the pre- as well as post-intervention interviews was created for each participant. Researchers reviewed both quantitative

and qualitative findings with participants to confirm accuracy. No questions or concerns were voiced regarding results. Next, two researchers coded all interview responses for themes in both data sets. Subsequently, to establish trustworthiness, researchers reviewed the interviews for emergent themes based on the coding and established intercoder agreement on the themes by comparing individual results. In addition, a third researcher reviewed and confirmed the themes after initial analysis. Finally, researchers identified emergent themes for both data sets that contributed to deeper understanding of the responses to the questions asked from the interviews before and after the program. In addition, triangulation of interview data was established through researcher field notes collected during and immediately following practices and competitions for each athlete.

According to Creswell and Plano Clark (2011), the concurrent parallel type of mixed-methods design seeks to understand “whether the results from both analyses converge and how they converge” (p. 223). To that end, researchers used side-by-side comparisons of the merged data analyses, comparing potential themes from interview data with the survey data.

Results

Description of Participants

Six residents participated in this pilot program. Participants included five females and one male; four Caucasian, one Hispanic, and one African-American; with an average age of 83.5 years (range = 76–92), and with primary diagnoses including generalized weakness, hearing impairment, visual impairment, dementia (mild-moderate), depression, and/or anxiety. All participants completed all four sports of the adaptive sports program. Each participant additionally completed quantitative and qualitative pre- and post-program testing.

Quantitative Pre-test/Post-test Results

Five quantitative tests/scales were administered prior to and after the 4-week program to all six participants. Analysis of pre-test and post-test change scores identified a positive movement in all six of the outcome measures: loneliness, competence, autonomy, social relatedness, and TUG over the course of the program. Paired differences of raw data from pre-program to post-program were also plotted for each participant separately. Individually, each test showed improvement for the majority of participants.

Loneliness. Overall, loneliness scores declined in half ($n=3$) of the participants with one participant showing no change. The remaining two participants' loneliness scores increased. One of these had a slight increase of 1 point, but the other seemed to be an outlier with a 16-point increase—a negative result for this scale. Further examination of qualitative input from this participant revealed that this resident described feeling trapped in her room due to a new neighbor's dementia-related behaviors (i.e., yelling, sobbing). In fact, the resident admits to voluntarily confining herself, stating, “I have to have my door closed. It makes me feel trapped in [my room].” In regard to the team, she described feeling “close to her teammates” and thankful for the relationships developed. See Figure 1.

Self-Determination. Measures of self-determination were evaluated using the BPNSS for autonomy, competence, and relatedness. Improvements existed in each of these areas for almost all six participants.

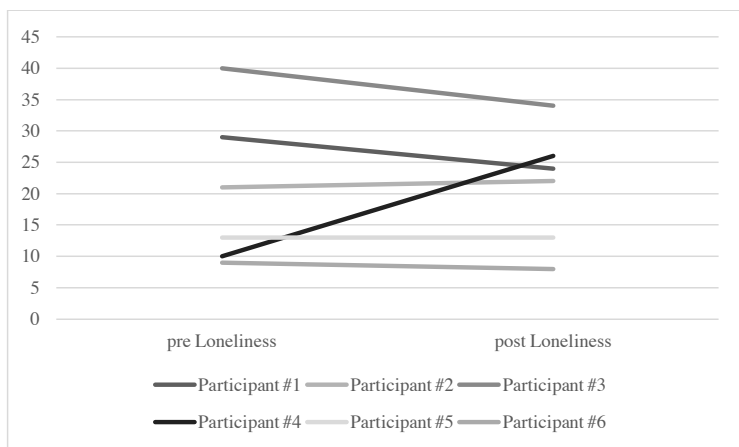


Figure 1. Pre-test versus Post-test scores for UCLA Loneliness Scale

Autonomy. Autonomy can be described as self-regulation. Prior to the pilot program, half of the participant scores ranged from 2.86 to 5.86 on a 7-point scale. All but one participant showed improvement from pre-test with five showing improvements. The largest increase was 1.28 points, and the singular decrease was less than a half of a point. See Figure 2.

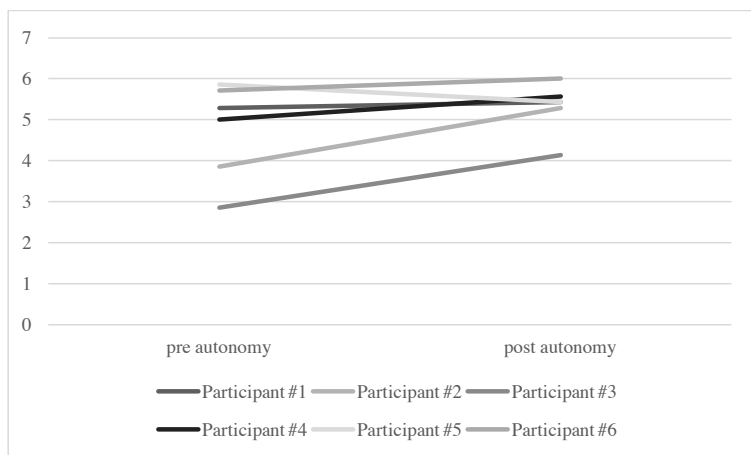


Figure 2. Pre-test versus Post-test scores for BPNSS-Autonomy

Competence. Competence can be defined as mastery of the environment. Most pre-test scores ranged from 3.33 to 6.0 on a 7-point scale. Two participants' scores increased by over 1.5 points, with two participants' scores remaining the same. Only one, participant #5, showed a decrease in competence. See Figure 3.

Relatedness. Relatedness can be described as the desire to connect with other people. Although all participants' pre-test scores were 5.0 or higher, all post-test scores increased to a minimum of 6.0. See Figure 4.

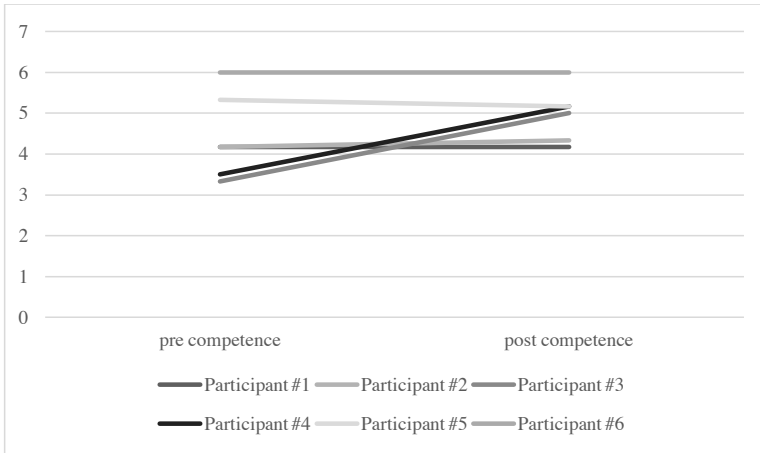


Figure 3. Pre-test versus Post-test scores for BPNSS - Competence

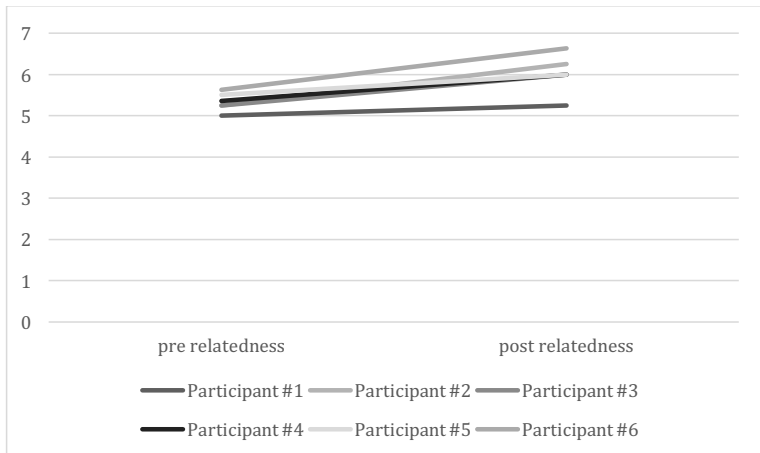


Figure 4. Pre-test versus Post-test scores for BPNSS - Relatedness

Timed up and go (TUG). Although standing/walking mobility was not an ultimate goal of the program, since all of the participants used wheelchairs, TUG scores were measured to identify improvements in balance and assisted mobility. Pre-test scores for these participants ranged from 20 to 83 seconds. Post-test scores showed improvement for three participants, one participant with no change, and only a two second increase for the two remaining participants. Improvement ranged from 13 to 34 seconds. According to the Podsiadlo and Richardson (1991), for individuals who

can walk independently without assistance or ambulatory aids, a TUG score of over 12 seconds suggests that a participant walking without aids or assistance could be a fall risk. Age matched scores for individuals aged 80-89 (age range of study participants) with a device, however, average 19.9 seconds (sd +/- 6.4 seconds) (Lusardi, Pellecchia, & Schulman, 2003). Therefore, participants of this study showed improvement in assisted mobility despite that they participated in the program sitting in a wheelchair. See Figure 5.

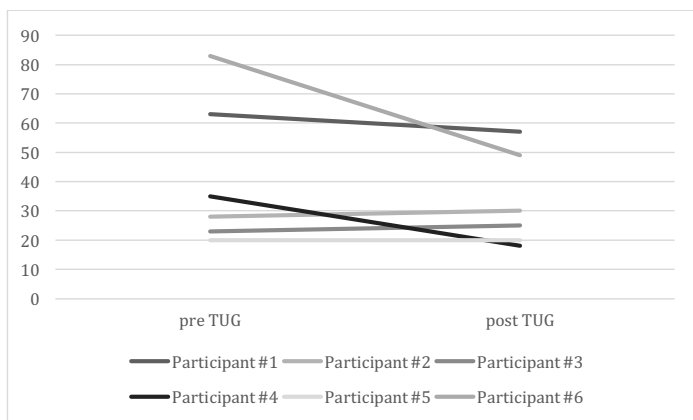


Figure 5. Pre-test versus Post-test scores for Timed Up and Go Test (TUG)

Collective changes per measure. In addition, collective changes among all participants for each measure were calculated. As a group, results showed positive movement for each of the five measures. In two cases, an outlier skewed original results; participant #4 experienced roommate problems that likely affected loneliness score and participant #6 received physical therapy, which likely affected TUG score. Collective change results are in Table 1 noting where total percentage changes were calculated without these outlier examples.

Qualitative Results

Interviews were conducted before and after the adaptive sports program to address concepts or areas that might have been missed by using only quantitative measures. Themes emerged from both sets of interviews. See Figure 6.

Pre-intervention interviews. Overall, findings from qualitative interviews conducted prior to the intervention indicated generally happy individuals who felt safe and acknowledged but resigned to a passive life at the SNF. The comments received from the pre-intervention interviews, however, were relatively brief with few participants elaborating on questions asked. While this limited the ability to generate themes, several patterns emerged throughout the pre-interviews. In addition to questions related to measures, the researchers asked participants about broad issues such as quality of life. These questions yielded answers that were conspicuously void of positive perceptions related to identity, meaningful leisure, or the elements of self-determination. Although not as substantial as the post-program interviews, the following three themes emerged from pre-program interviews.

Table 1

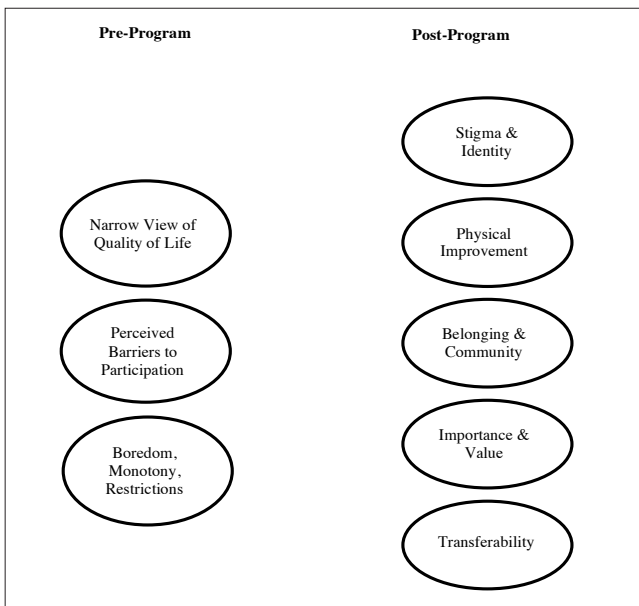
Summary of Percent Change from Pre-test to Post-test by Participant

	Δ UCLA Loneliness*	Δ BPNSS Autonomy	Δ BPNSS Competence	Δ BPNSS Relatedness	Δ Timed Up & Go
Part 1	-17.24	+2.65	0.00	+5.00	-9.52
Part 2	-4.76	+36.79	+3.84	+19.05	+7.14
Part 3	-15.00	+44.76	+50.15	+14.29	+8.70
Part 4	+160.00 *	+11.40	+47.71	+11.94	-48.57
Part 5	0.00	-7.34	-3.00	+9.09	0.00
Part 6	-11.11	+5.08	0.00	+17.76	-40.96*
Average Change	-9.6%**	+15.56%	+16.45%	+12.86%	-8.45%***

*indicates extenuating circumstance during testing period that likely affected scores (#4 experienced roommate issues; #6 experienced daily PT as a result of hospital stay)

** without outlier (#4)

*** without outlier (#6)

**Figure 6.** Pre-test and post-test qualitative themes

Narrow view of quality of life. Many of the participants shared limited descriptions of quality of life, greatly based on quality of care at the SNF. Some of the descriptions of quality of life included phrases such as, “Because I live at [name of facility], the quality of life is very high, but that doesn’t mean that I like to be here... because I get my meals, I get my medications on time, the nurses are just great, and so are the CNAs.” Another shared, that the facility is “a good place; you’ve got good food, the facilities are clean, there’s no smell or anything like a hospital.” It seemed that expectations of quality were centered on hygiene, meals, and safety but did not include much beyond these elements, such as friendships, meaningful leisure, or experiences that were personally significant. In fact, most comments related to social interactions being centered around getting along with staff and/or others with whom they dined. None of the participants described friendships beyond those developed with roommates. Similarly, none of the participants discussed hobbies or any type of meaningful leisure.

Perceived barriers to participation. When asked about past leisure pursuits, all six participants noted partaking in some form of active physical exercise/activity at some point in their lives (e.g., tennis, baseball, track, basketball, boating, ice skating). All participants, however, noted limitations to participating in physical activities today, citing disability, weight, age, or lack of knowledge of opportunities. They seemed to embrace the stigma of limitations due to disability. Reasons why they did not engage in sports included comments such as, “because of my disability,” “because of my legs; I can’t walk,” or “It’s just my body that’s worn out.” Others indicated displeasure with the situation, stating, “If I had more eyesight, then, I’d probably be doing a lot more things that you have to offer.” Another more specifically said, “I used to enjoy [tennis], but I think it’d be too much for me now in my disability.” Other examples suggested perceived barriers, especially age, that meant that they “should not” participate in sports-type programs. Comments included, “Some things you don’t do when you are 82 that you did when you were 21.” Several residents articulated apprehension of being successful or contributing to the team. They shared fears that they, “would not measure up to the ability [due to lack of experience].” Other similar comments included concern about lack of skills: “I’m worried about not doing well.” “I know I can’t do them.” Thus, qualitative commentary illuminated perceptions of age and/or disability that hindered participation in previously enjoyable and meaningful leisure pursuits. In fact, one participant directly related her perceived situation with her loss of identity, expressing, “It’s just the circumstances of my health that stops me from being who I would like to be.”

Boredom, monotony, restrictions. Participants shared that their involvement in recreation and leisure activities at the SNF were primarily passive and not physically engaging. Prior to the pilot adaptive sports program, participants identified their engagement in physical activity within the facility with phrases such as “bored,” or indicated that group activities consisted of only BINGO, the Wii, or “Sit and Get Fit.” Some indicated that they were aware of activities but typically chose not to participate. Others stated they were unaware of opportunities. Finally, when asked about the potential of participating in the adaptive sports program, while many responses were hopeful, many noted issues with a sense of low self-efficacy, fear, or apprehension. For example, one participant stated, “I’m worried about not doing well. Not being able to perform is my biggest worry.” Other patterns illustrated how emotionally they felt dismay at losing control in their current environment. One stated, “I don’t feel like I’m in control too much in my life right now. I can’t make any decisions for myself, but I understand some

of them.” Another stated, “I’m not allowed to do anything that I want to do. I can’t get out and go anywhere. I can’t drive a car, but that’s not their fault.” See Figure 6.

Post-intervention interviews. These interviews were much more comprehensive and generated rich insights into the benefits of this adaptive sports intervention, specifically in areas of social interaction, purpose, community, quality of life, and perceptions of physical competence. A total of six overarching themes emerged from the data across subjects with several sub-themes evident as well. Below are the six major themes that were gleaned from the post-intervention interviews showing pre- and post-intervention reactions and perspectives.

Stigma and identity. Post program interviews clearly demonstrated a change in the residents’ perceptions of ability to participate in an adaptive sports program. In contrast to the negative and concerned comments shared, post program interviews illustrated surprise and pleasure at their accomplishments and abilities. Once participating, they took on competence as a goal. One stated, “We wanted to try to get better and try to make the team better.” A participant that seemed to be initially hesitant shared her excitement at doing well in all of the sports. She stated, “I was able to participate in all of them. In two of them, also, I had a good score.... I was able to perform! I was able to do them! That’s it.” Another indicated the importance of being able to perform these skills. She said, “I never dreamed that I would sit in a wheelchair and put a ball into a basket. It was exciting, and it was really meaningful.” Still, another seemed to marvel at the fact that she could succeed in these activities. She said, “I had a big surprise with the baseball. I could do that... It just sort of amazed me that I could hit that ball, so it felt really good when I connected.” These achievements seemed to affect their sense of self, spurring conviction in these new and rediscovered abilities. She shared, “I am confident in my ability to participate in adaptive sports, because now I know I have the ability to do it and I like to do it.”

Physical improvement. After participating in the program, most of the participants noted some sort of physical improvement as a result of the program. For example, one participant noted that because of the program, she is “...stronger and I’m more active. I’m just doing things that I haven’t done before—using my upper body and my arms. You use your legs a lot when you move around the bases, shoot a basketball, or play golf.” Another stated, it “helped me get my strength back again.” In addition, several of the participants seemed surprised at the impact of their physical improvements. One participant, when talking about her ability, stated that her physical accomplishments made her think about “freedom.” As expected, during the interview prior to the pilot program, when asked to “rank” (list in order) the areas of functioning that they expected would most likely improve through adaptive sports (i.e., physical, cognitive, social, or emotional), all but one listed physical improvement as first. After the program, however, most of the participants identified that they experienced the most improvement in the emotional and social domains and were surprised that they experienced fewer improvements in the physical domain.

Belonging and community. The sense of community stemming from participating on a team was evident in many comments. One stated that, as a result of the program, “I do now [feel fellowship], I really do.” Another shared the mutual support, “we praised one another... we helped one another.” One team member highlighted the essentiality of a sense of “team” to the overall experience. He stated, “We all had to feel

like a team. We really did. Some people had never been on a team, and they didn't think they'd like it, but before it ended, they liked it."

For others, the program seemed to facilitate feelings of relational connection beyond teammates. One woman who was the only person of color among the participants, stated that prior to the program, she felt as if other residents viewed her as "different," thus she chose to keep to herself. After participating in the program, however, she identified, "95% of those people like me. I think we get along quite well together." Another team member also noted a lack of relational well-being, stating in her pre-program interview that, outside of mealtimes, "I don't feel connected to my peers." After the program, she remarked, "I got to feel close to my teammates." "It was delightful...we would laugh and joke. We got along." She continued, "we were part of something that was so much bigger than we are." Other examples referenced feelings of connection and belonging included a participant who shared how she fought depression for 30 years but recognized and valued the importance of social interaction for her mood. After the sports intervention, she described not only familiarity, but true kinship between team members, stating, "I feel like I've got friends, and you can tell them anything about family, beliefs, and all that." She added, "I'd do anything for them, and they'd do anything for me, too."

A particularly powerful outcome related to belonging was the sense of celebrity and recognition that several of the participants experienced. For example, one woman stated that, "Every day people are walking up to me, calling my name." Another described the acknowledgment she experienced from among the other residents who were not on the team, as well as from staff. She described, "The ones that would see me outside of the game, everyone was just saying, 'Hey! Don't forget [the] game tonight!' They were asking me questions about it, and I thought it was great."

Importance and value. Although feelings of celebrity contributed to an overall sense of belonging, this phenomenon of being "recognized" or known by others may have been augmented by the purpose felt in being accountable to teammates and routinely engaged in meaningful activity. Several noted that the program was "something you look forward to." One stated, "It made me feel important." Another noted the satisfaction she experienced as a result of the program sharing, "We took great pride in making everybody feel good." Others described the importance of connecting with previously personally significant leisure experiences. One stated, "I had not for a long time had the opportunity to play golf or the other games we played... basketball, baseball. I really enjoyed it."

Transferability. Despite the relatively short duration of this program, several indications of transferability emerged. Pre-program interviews gleaned participant perspectives about relationships with staff, feelings of inability, and interest in their environments. Post-program interviews included direct and indirect references to applying newfound skills and attitudes to other aspects of their lives. One woman, in particular, identified how the program helped her feel more comfortable interacting with facility staff. She stated that, after the final program meeting, she set a goal to improve her relationship with her CNAs. After stating that her caregivers "seemed to look down on me like I was 2 years old," she continued,

I realize some people don't understand where you're coming from, but now I realize maybe I just don't understand where they're coming from. This pro-

gram really helped me to look into that. I think, if we can all get along in sports with these young people (and we're old!), then why can't I get along with everyone else—particularly the people who are taking care of me.

This resident identified feelings of acceptance and empathy experienced in the program and applied this lens to daily interactions.

Prior to the program, several participants also noted feeling a lack of control over their environment. Afterward, several acknowledged their sense of control during the program. For instance, one shared, “I didn't want to give up. My own determination [motivated me to continue to come to practice].” The act of being accountable to oneself and identifying a personal choice to adhere to goals seemed to facilitate feelings of perseverance. One participant summarized the benefits she received from participation in this program, underscoring lasting skills, experiences, and relationships that will transfer into her daily life. She stated, “they helped me gain my strength back, I made friends, the way they treated me, and my capabilities, now that I didn't have before.”

Similarly, several participants noted cognitive benefits of the program. For example, some noted how much they enjoyed the educational aspect of the program. Specifically, participants referenced their pride in learning new skills. For example, one shared her excitement at learning “to do new procedures.” Another participant stated how the program helped him open up his observational skills, noting, “I think I'm a little more alert now. I find myself looking around me a lot more.” These cognitive improvements are clearly transferable and intertwined with other social and emotional benefits of the program.

Impact of program design. The last theme addressed the value the participants saw in how the program was prepared and implemented. Completely unsolicited, many shared how program design, staff investment in their successes, RT coach expertise, and the comprehensiveness of the program sparked involvement and motivated athletes to maintain participation to completion. It seemed that the participants attributed many of their positive outcomes to not only how the program was designed but also the comprehensiveness of the planning and implementation. For example, several noted that they valued the adaptive nature of the program being, “geared to (their) ability and disability.” Several participants also shared the importance of the RT coaches' approach to motivating them throughout the program. One stated that she enjoyed, “the girls (RT staff), all four of them encouraging me.” Similarly, a participant felt that the staff instilled confidence by encouraging her to continue to come to practices. “They kept telling me I could do it. I didn't believe them, but I do now. It all came out okay!” Another shared that the staff, “made it feel important. They made us feel important and helped us to the best of our ability.”

Participants also noted the therapeutic and technical skills of the facilitators. One stated that the RT staff, “explained to us how they wanted us to do it.... If it wasn't for their help, I'm sure everybody thought, ‘I can't do this,’ ‘I'll never be able to do this,’ but [the] girls all proved that we were able to.” Another remarked how a simple adaptation helped her participate. “... the basketball was my challenge, because I can't throw overhand. but when I switched to underhand and used the other hand to help, I could do it. I made them.”

Following the final competition, RT facilitators hosted an awards ceremony attended by team members, interdisciplinary staff members, family, and the other residents of the facility. This event was also recognized as an important program element contributing to the success of the experience. One resident athlete stated, “The awards were so wonderful. We each were recognized for something, and that made it really superb.” Overall, qualitative interviews revealed resident perceptions that the pilot adaptive sports program provided varied but significant benefits in all four domains for each of the six participants. See Figure 6.

Integrated Results

Synthesized findings of both quantitative and qualitative results showed that all participants improved in most, if not all domains (cognitive, emotional, physical, social). In addition, relationships existed between all five test measures and the five emergent themes. It also appears that the last theme, impact of program design, was intertwined among the other themes as well as the variables measured quantitatively. See Figure 7.

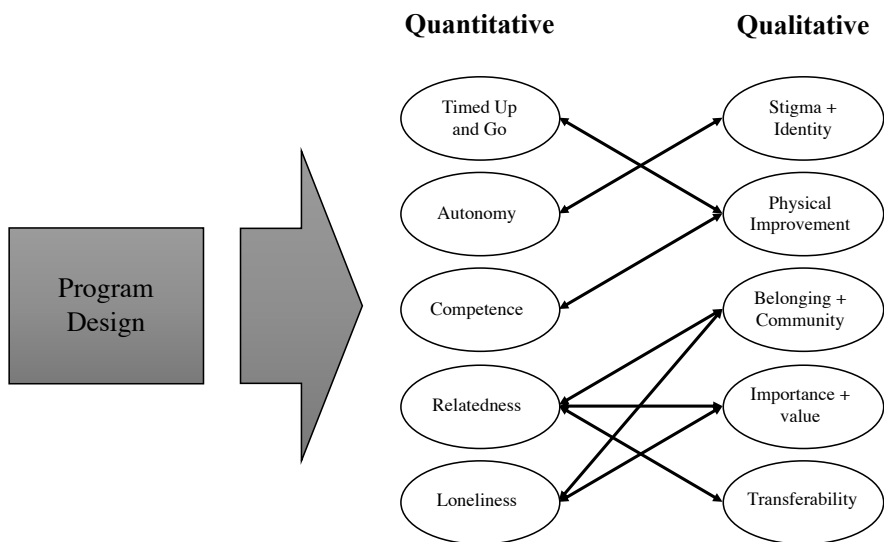


Figure 7. Relationships between quantitative and qualitative results.

Each of the variables measured quantitatively seemed to relate to at least one of the emergent themes from the interviews. For example, mobility (TUG) and competence were represented through the statements about physical improvement. Similarly, issues of autonomy were evident in discussions of stigma and identity. Perhaps the strongest connection between the two data sets, however, occurred in the areas of social relatedness and loneliness. These had many links with the themes of belonging and community, importance and value, and transferability.

For some of the participants, understanding the context of their experiences helped emphasize the relevance of these improvements. For example, Participant 1 had the largest improvement on the loneliness measure (-17.24%). In her pre-test interview,

this participant expressed feelings of being an outsider and identified a divide between her and the other residents and staff that were “different” than she. In addition, this participant’s autonomy score increased 36% and relatedness 19%. As this was the only participant of color, her improvement further emphasizes the impact of this program on social relatedness from a cultural perspective. Still another example was Participant 3 who noted prior to the program how she felt compromised by a visual impairment. Post-test scores, however, showed improvement in all post-test measures except the TUG. Of particular note were her improvements in competence (+50.15%) and autonomy (+44.76), especially in light of her perception of loss of potential due to her visual impairment.

Discussion

The purpose of this pilot study was to measure the impact of an adaptive sports intervention on four domains of individuals residing in a SNF. In addition, specific research questions addressed the impact of this sports program on participants’ levels of loneliness, autonomy, competence, relatedness, and mobility. Synthesis of both quantitative and qualitative findings suggest that although technically a physical “sports” program, this intervention contributed to improvements for all participants across cognitive, physical, emotional, and/or social domains as well as in all outcomes measured. These results generate three major conclusions for this study. First, these results offer preliminary evidence that an adaptive physical activity program can impact more than just physical outcomes. Therefore, it is plausible that the actual trigger for some of these improvements may not be physical activity alone, rather the contributions of the psychosocial factors integrated into the program which contributed to their motivation to pursue and complete the program.

Second, social and emotional domains seemed to be the most prominent areas of improvement and focus among the participants. The relationships built during this process translated to a sense of belonging, community, and personal value for many of the participants. These elements can be considered as contributors to the sense of “home” that as Mahoney (2010) noted are often lost in transition to a SNF. Consistent with Mahoney’s (2010) description of home, these participants identified the importance of becoming known to others as well as feelings of empowerment as a result of this program. Similarly, these results suggest that one’s sense of autonomy might be related to one’s ability to engage in meaningful social and emotional experiences as Jansen et al. (2018) noted.

Finally, the results of the study pointed to the potential for transfer of the experiences and skills to a greater involvement in their community. Most of the participants in this study showed improvements in ambulation despite that they participated in the program sitting in a wheelchair. Although these mobility improvements may be, in part, related to physical tasks of seated sport participation, Jansson et al.’s (2017) findings that individuals who were less lonely may be more mobile and independent uncover potential that physical improvements found in this study could also be linked to increased social involvement or decreased loneliness. In addition, some qualitative results indicated increased motivation to become more involved in community through peer relations and leisure participation.

Therefore, this adaptive sports program demonstrated potential as an accessible and feasible way to implement evidence-based practice in a LTC setting. In this way, these RT programs can increase perception of “home,” as well as address different deficits.

Limitations

Several limitations should be considered when interpreting the results of this pilot study. First, the results were based on a convenience sample of only six participants. As a result, although consistent with the typical demographics of a SNF (CDC, 2015), this sample was predominantly female and Caucasian. Also, the small size and lack of purposive or random selection limits generalization to only the sample from which the participants were selected. Finally, the tendency of a convenience sample toward self-selection of participants can have its consequences in that “...the effect of outliers can be more devastating in this kind of subject selection” (Etikan, Musa, & Alkassin, 2016, p. 2).

Second, there were some underlying limitations within the physical assessment of the participants. Despite all participants being able to walk with a walker, all of the athletes primarily participated in a seated position in their wheelchair. Therefore, in retrospect, other measures may have been more appropriate (i.e., sitting balance, range of motion, grip strength, wheelchair mobility). In addition, an unanticipated challenge arose in that one participant was hospitalized prior to the study. Her readmission to the LTC unit resulted in a physical therapy (PT) order that lasted the duration of the study, becoming a mediating factor to her physical performance that the other participants did not experience. The researchers recognize the resident’s physical baseline was compromised from hospitalization, thus, could not directly attribute her TUG solely to participation in the pilot research study. The combination of the RT-based adaptive sports program and PT resulted in her scoring the largest improvement in TUG scores. Finally, it is important to note the potential for bias due to the working relationship between the program researchers and participants. Although all participants were informed of confidentiality and anonymity of participating in the research study, the possibility that some might have indirectly tried to appease the RT staff that administered the pre- and post-tests and interviews exists. In addition, it is uncertain as to whether familiarity with the RT staff that both implemented the programs and collected the data could have an impact on post-test results.

Recommendations

Recommendations for Practice

Several recommendations for RT practice were generated from the results of this study. First, it would be prudent to consider the need for extension and continuity of a program such as the one described here. The NCTRC Job Analysis Report identified “older adults” and “long-term care” as the “primary age group” and “primary level of service” for the profession (National Council of Therapeutic Recreation Certification, 2014). Older adults are projected to remain the primary consumer of RT services with the evolution of the baby boomers. As CTRSs are often misplaced in activity director roles, it is vital that activities and RT are marketed appropriately in such settings. Like most health-care professions, there is obvious overlap between both fields. However, activity services and RT are two distinct professions working together as part of the

interdisciplinary team (IDT) as complementary, not synonymous, services. This study serves as an example of the two services working conjointly for collective benefit. In the continuum of care, activity professionals ensure continued opportunity to maintain participation in important leisure interests through the addition of adaptive sports activity programming to the monthly calendar, as well as play a unique, strategic role in referring residents for individualized, physician-ordered RT services as needed.

In addition, there are several recommendations for facilitating adaptive sports specifically in older adult settings. First, practitioners should stay as authentic to the sport as possible to avoid the risk of residents feeling “childish.” Therefore, it is important to adapt as little as necessary to facilitate a sense of accomplishment and pride (National Center on Health, Physical Activity and Disability [NCHPAD], 2019). Also, facilitators should refer to the residents as “athletes” to foster a strong sense of identity and purpose. Strengths-based approaches and specified feedback are vital in setting residents up for success, nurturing confidence, and encouraging continued participation. Involve families, staff, and remaining residents to promote a sense of community and to incite intrinsic and extrinsic motivation for the participants. Finally, the facilitators should attempt to complete the three phases of recreation activities for full benefit; anticipation (i.e., marketing and practices/skill building), participation (i.e., competitions and hype), and debrief (i.e., recognition ceremony, banquet, movie).

Another practical consideration involves marketing to the administrator for crucial financial and programming support. First and foremost, RT professionals should market that RT is a physician-ordered therapy, uses standardized assessments to collect resident data in all domains, designs goal-directed treatment plans, and provides functional outcomes to share with residents and family. Apart from proper articulation of RT services, proper caseloads and programming foster administrative support through targeting specific residents and/or diagnoses that have “unmet needs.” For example, as in the current study, higher functioning residents who are “restless” or feel they don’t belong in LTC may benefit from adaptive sports. One way to garner the administrative investment is to target those residents who are trending at interdisciplinary team meetings (e.g., residents with dementia-related behaviors). In addition, as with most RT services, securing a physician’s order for participation not only is a criterion for therapy, but also validates the program as legitimate.

Also important to note, marketing RT programming for older adults extends further than our clients and employers; there are essential implications in academia as well. Many RT students may not naturally be drawn to older adult settings due to pre-existing stigmas of monotonous or mundane programming. In fact, many students who are attracted to outdoor and sports programming pursue those types of programs with youth and veteran populations in mind. The results of this research study should not only challenge stigmas associated with aging and awaken young professionals to innovative opportunities for programming within older adult settings, but should also call academia to action, advocating for older adults to be included in educational discussions involving adaptive sports. In addition, although some universities have begun to market Applied Gerontology tracks, gerontology courses should be designed and offered to RT students to prepare them adequately for the largest job market post-graduation.

Finally, the need for modern, creative RT programming for baby boomers is evident. Currently, most sport opportunities, such as the Senior Games, are geared more

toward independent older adults. Year-round adaptive sports leagues have the power to transform older adult settings such as memory care, long-term care, assisted/ independent living communities, day programs, and senior centers. RTs need to continue to be bold and progressive in all older adult settings to adapt to the ever-changing needs of our consumers.

Recommendations for Research

The research findings are encouraging, however, warrant a greater body of evidence from the RT profession to validate adaptive sports as a viable intervention in older adult settings. In addition, as different professions provide adaptive sports overall, it is vital that CTRSS differentiate research outcomes unique to the profession. Future research studies examining adaptive sports as an RT intervention, regardless of population and/or disability, should continue to research functional outcomes in all domains.

There are myriad implications for replication of this study. In this pilot study, the researchers collected data on only one team of participants. One recommendation for future research is to work collectively with CTRSS in other but similar settings to create an adaptive sports league. Data collected on all participating teams, then, will help grow the data base and establish that results were not due to the agency, rather due to the program. In addition, future studies would benefit from adding control groups to draw comparisons between adaptive sports participants and residents who solely participate in more traditional activity programming such as chair exercises. If possible, randomization would also strengthen the confidence of the results. Finally, adding the status of “not active in PT” as an inclusion criterion could help control some of the potential for confounding variables and outliers.

Other considerations for future research relate to the structure of the program and how it was measured. Although this study had two practices and one competition each week, arguments could be made for three practices per week for the initial weeks to allow more time for skill acquisition and confidence building prior to the potential anxiety involved in competition. This research study also allowed participants to pick their top four sport interests to meet differing preferences in sport selection. Depending on participant preferences, however, selecting one sport to master over a 4-week period may also yield strong positive results supported by the SDT’s concept of competence. Novelty may also serve as an extenuating factor in itself, as this program was unlike any program that had been previously implemented at this facility. Therein lies the question, if repeated over time or integrated as a year-round program, would participants lose interest or receive fewer benefits? Finally, a third series of data collection approximately 30 days after the end of the program would help determine if the positive movement in outcomes extinguishes or if there is lasting impact of this program.

In terms of measures, there are several recommendations that could strengthen a replication of this study. First, future researchers should consider alternative or additional physical data measuring sitting posture and balance, upper extremity range of motion, grip strength, reaching balance, etc. Also, future studies involving residents who primarily use wheelchairs, could incorporate a measure for wheelchair mobility. The TUG was most relevant to the one participant who took occasional opportunities to stand. Nevertheless, the improvements found are encouraging results, implying that adaptive sports may have a larger effect on TUG scores of more mobile older adults, extending to residents in assisted and independent living communities.

Finally, additional aspects of what is measured, methods of collection, as well as from whom it is gathered could offer new insight into the value of this type of intervention. Future research may explore outcomes with a particular focus on additional emotional elements. While elements of social connection were discussed, future research may delve deeper into the concepts of community or “feelings of home” as noted by Mahony (2010). Similarly, practitioners should consider administering a Geriatric Depression Scale pre- and post-intervention, since the literature also supported the impact of physical activity on depression.

Finally, as noted, since physical activity can have a positive impact specifically on elements of cognitive functioning (e.g., Labban & Etnier, 2018), specific cognitive measures for individuals on all levels of functioning should be considered. Although the MMSE is typically used as a screening tool, its inclusion as an outcome measure could provide useful information as to the effect of physical activity on mental status. In addition, measures specific to recognition and recall such as the Rey Auditory Verbal Learning Test (RAVLT; Lezak, Howieson, & Loring, 2004) would prove informative in measuring the effects of physical activity on cognition for this population.

In addition, other sources of data such as documentation on elements such as falls, medication use, and behaviors before and throughout the duration of the intervention could add important insights. Finally, since low numbers of participants are likely in future studies, application of a multi-baseline single subject design would be beneficial in providing multiple data points before, during, and after the intervention. Supporting qualitative interviews with staff and family members throughout the study would provide an additional perspective to the potential benefits of the program. In the future, this would be a distinctive opportunity to capture meaningful interactions and any changes in relationships pre- to post-intervention.

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