AN ABSTRACT OF THE THESIS OF

Alicia M. Dixon for the degree of Master of Science in Movement Studies in Disability presented on December 8, 2010.

Title: Roles of Self-Efficacy and Social Support on Physical Activity Behavior in Older Adults with and without Intellectual Disabilities

Abstract approved:

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In order to increase life expectancy without long periods of morbidity, physical activity should be a component in every older adult's lifestyle. It is proven that regular physical activity can improve health and quality of life for older adults; however, the older population is one of the most sedentary populations with less than 40% participating in any physical activity (Hughes, Seymour, Campbell, Whitelaw, & Bazzarre, 2009). In addition, physical activity patterns of older adults with intellectual disabilities (ID) have not been the focus of empirical research studies. It has been shown that adults in this population are not participating in enough physical activity to

receive health benefits (Stanish, Temple, & Frey, 2006). The key to determining why older adults are not participating in physical activity is to examine the barriers associated with physical limitations, and the psychological barriers that are limiting older adults with ID to initiate physical activity. The current study was designed to provide insight to why older adults, with and without intellectual disabilities, are not participating in sufficient amounts of physical activity to receive health benefits. The study provides valuable information about physical activity patterns of the older population with intellectual disabilities and information for future physical activity interventions specific to this aging population. The purpose of this study was to compare the roles of self-efficacy (SE) and social support (SS), as outlined in Social Cognitive Theory (Bandura, 1987), on the physical activity (PA) behavior of older adults with and without intellectual disabilities.

Methods: A total of 119 participants, older adults with ID (n= 35), younger adults with ID (n= 49), and older adults without ID (n= 34), completed validated scales, SS and SE for Physical Activity Participation (Peterson et al., 2009), and wore a pedometer (OmronHJ-720ITC) and accelerometer (GT3X-ActiGraph) for seven consecutive days.

Analysis/ Results: Correlation coefficients and one-way ANOVAs with Bonferroni technique were calculated to examine the relationships and differences between study variables. Physical activity level was significantly different among groups for both pedometer walking steps (F= 5.547, p<.01) and moderate-to-vigorous physical activity

(MVPA) (F= 6.633, p<.01). Older adults with ID had significantly lower walking steps (3864 ± 2061) than both comparative groups; older adults without ID (6109 ± 3031) and younger adults with ID (5926 ±2975). The results in average minutes per day of MVPA are as follows: younger adults with ID =40 ± 35 minutes, older adults with ID =15± 17 minutes, and older adults without ID =34 ± 31 minutes. Older adults with ID had significantly less MVPA than younger adults with ID. SE was significantly different among groups, F =11.883, p <.001. SE was significantly higher for older adults without ID (15.82 ±2.35) compared to younger (12.56 ± 3.75) and older adults with ID (12.38 ± 3.61). SS from family and SS from peers were also significantly difference among groups (F =4.592, p= <.05; F = 4.812, p= <.01). Older adults with ID had significantly lower SS from family (9.41 ±3.92) compared to younger adults with ID (11.82 ± 3.60). Younger adults with ID had significantly higher SS from peers (9.78 ±2.89) than older adults without ID (7.94 ±2.37).

Conclusion: Older adults with ID need programs to facilitate higher SE to empower them to participate in PA. Health promotion interventions should include strategies to increase perceived personal skills, which is a source of decreased efficacy for those with ID (Temple, 2009). Additionally, interventions should focus on decreasing negative supports for physical activity and creating better role models for those aging with ID. Incorporating both those with ID and their supports may be an optimal way to change PA behavior.

Roles of Self-Efficacy and Social Support on Physical Activity Behavior in Older Adults with and without Intellectual Disabilities

by

Alicia M. Dixon

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I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

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Alicia M. Dixon, Author

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CONTRIBUTION OF AUTHORS

Dr. Miyoung Lee, Oregon State University, was involved with the conceptualization of the study and research design, data analysis, and reviewing the proposal and thesis documents.

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CHAPTER 1

Introduction

The overall age demographics of the people in United States will change considerably within the next 50 years. As the "baby boomers" age, the prevalence of the older population will also rise drastically. By 2050, there will be 80 million older adults, which is 1 in 5 individuals being 65 years or older (Perkins, Multhaup, Perkins, & Barton, 2008).

Understanding the health behaviors of older adults, especially older adults with intellectual disabilities (ID) is an area within public health (PH) where little is known. With increases in life expectancy over the past decade, adults with ID are going to be a visible part of the aging community. Although today's older population with ID still have a shorter life span to the general population (approximately 65 years), the current younger generation of adults with ID are expected to have comparable longevity to the general population (76.9 years) (Bigby, 2004; Fisher & Ketti, 2005; Torr & Davis, 2007). With increases in life expectancy, adults aging with ID are developing chronic conditions such as cardiovascular disease, diabetes, heart disease, and cancer at similar rates to the general population (Bigby, 2004; Bittles, Petterson, Sullivan, Glasson, & Montgomery, 2002; Fisher & Ketti, 2005).

Physical activity (PA) is one particular health behavior influencing the onset of chronic conditions. Little is known about the PA patterns of older adults with intellectual disabilities, and the factors affecting this behavior. A previous study by Peterson, Lowe, Peterson, Nothwehr, Janz, and Lobas, (2008b), examined PA in adults with ID, to determine if personal and environmental factors played a mediating role in this behavior. The study (*n*= 150) found a trend for adults with ID (35-60 years) to have lower PA levels, lower self-efficacy (SE), and decreased social support (SS) from family for PA. Further support for research was demonstrated in Stanish, Temple, and Frey (2006) review of the literature where age, an unexplored factor, *appears* to be negatively associated with PA for those with ID. As the majority of our society ages, it is important to evaluate factors affecting health outcomes, especially in disability populations. One reason being those with disabilities start life with a "thinner margin of health" (Pitetti & Campbell, 1991), having more frequent use of health care, exhibiting more unhealthy lifestyle behaviors, and having lower access to health promotion (HP) programs (Drum, Krahn, Peterson, Horner-Johnson, & Newton, 2009a). This demonstrates an increased risk for a widened gap between the health of older adults with and without disabilities.

Only until recently has the focus on chronic conditions and lifestyle behaviors of those with disabilities been included in public health initiatives. Public health in the past has focused on the prevention of disability in the traditional perspective of avoiding the negative outcome of having a disability. Those with disabilities were

often referred to as failures of public health efforts and left out of health promotion programs. As a result, individuals with disabilities are potentially the largest underserved group of Americans with evident health disparities (Drum, et al., 2009a). The more contemporary approaches to disability and public health have begun to examine health disparities and the prevention of secondary conditions. As described in Drum, et al. (2009a), PH has started to look at the disability status being affected by social factors impacting health. This perspective provides a pathway to fill in the gaps of preventable disparities in subpopulations of disability by examining social determinants of health.

In order to design appropriate HP interventions, determinants of health and risk factors for chronic conditions need to be further examined in subpopulations of disabilities. One essential determinant of health for those with ID is the social environment. Social support is included as one of the World Health Organization's ten social determinants of health (Drum et al., 2009a). The social environment plays a role in PA behavior for many with ID, because these individuals depend on their supports for routine activities of daily living (Krahn, Hammond, & Turner, 2006). Rimmer and Rowland (2008) further emphasized that environment can exacerbate secondary conditions through discouraging or preventing participation in health promoting activities. This is true of those with ID whose environments are often structured by their supports.

Another aspect affecting on PA behaviors is the amount of confidence an individual has in their abilities to overcome barriers (environmental, social, and attitudinal). Self-efficacy for PA is shown in research to decrease with age in the general population (Lee, Arthur, & Avis, 2008). There is lack of evidence to show if decreases in SE is also evident in adults aging with ID. Relationships between the social environment, self-efficacy, and PA are important to examine in older disability populations, especially for those who are dependent on their supports to teach them skills to increase confidence and participation in health- promoting activities.

The use of the Social Cognitive Theory (SCT) will provide the theory-based approach needed to examine the interactions of the psychological and contextual environment on physical activity behavior. According to Peterson et al. (2009a), the SCT is a key theory of health behavior change for individuals with disabilities, and has been successfully used in HP programs involving individuals with ID, for example, the *Exercise and Nutrition Health Education Curriculum for Adults with Developmental Disabilities* (Heller, Marks, & Ailey, 2001). The core components of the SCT and basis for this study are personal factors in the form of self-efficacy, perceptions of the social environment related to social support, and behavior in the form of physical activity.

The lack of evidence related to physical activity and factors affecting this behavior could be detrimental to the health of older adults with ID. Moreover, accumulating knowledge to create appropriate HP programs in this population is

critical to prevent negative health outcomes for younger adults with ID who will be a visual subset of the aging community in the future. Therefore, the purpose of this study is to examine PA as it relates to social support and self-efficacy in older adults with ID in comparison to younger adults with ID and older adults without ID.

Methods

Participants

There were 119 participants included in this cross-sectional study, 35 older adults with ID, 34 older adults without ID, and 49 younger adults with ID. The older adults with ID were over the age of 50 (50-77 years), which is the set point determined in literature to be aging within this population (Grant, 2001; Hatzidimitriadou & Milne, 2005). Older adults without ID were over the age of 65 (65-89 years), which is a set point for aging without a disability (Spirduso, Francis, & MacRae, 2005). The younger adults with ID were between the ages of 20 and 49 years. Further demographic characteristics of the participants are included in *Table 1: Participant Demographics*. The adults with ID were identified as having mild to moderate ID by the agency in which they received services (supported living, foster care, and occupational services). Exclusion criteria included adults with severe ID, due to the nature of the self-report, and individuals who used an assistive device for walking.

The participants in the study were a convenient sample recruited in Oregon and Pennsylvania from supported living agencies, occupational agencies, and Special

Olympics events. A proxy from each site was available throughout the process for those with ID to assist in the consent process and survey materials. A proxy was someone who had regular contact with the participant and knew them very well. This included parents, caregivers, and staff. The criteria for being a proxy was working with the participant at least eight hours a week and knowing the participant for at least three consecutive months. For younger adults with ID, 18% of the proxies were parents or legal guardians and 82% were staff. Older adults with ID had 100% staff proxies. All participants signed an informed consent approved by the university IRB for the protection of human subjects.

Measures

Social Support and Self-Efficacy for Physical Activity Participation (Peterson, et al., 2009b): The self-efficacy scale is six questions with responses ranging from no, maybe, and yes. The social support scales are separated into subcategories related to family, friends, and staff. The social support scales are similar with six questions for the family scale, six questions for the staff scale, and five questions for the peer scale. The social support scales for family and staff contain questions referring to four types of social support: emotional, instrumental, informational, and appraisal. The social support scale for peers did not include questions about instrumental support.

The validity and reliability of these scales were measured through confirmatory factor analysis, Rasch modeling, Cronbach alpha, and intraclass correlation reliability analysis (J. Peterson, N. Peterson, Lowe, & Nothwehr, 2009b;

Lee, Peterson, & Dixon, 2010). The validity of the SE and SS scales were measured by the goodness-of-fit index (GFI) and the comparative fit index (CFI). The results indicated that the scales fell within the desired range >0.9. The Cronbach alpha for the four scales (three scales of social support, one scale of self-efficacy) ranged from 0.70-0.74, indicating satisfactory reliability. The ICC for the SS scales ranged from 0.76-0.79, indicating excellent reliability. The ICC of the SE scale was 0.49, indicating fair reliability.

Rasch modeling determined that all six items for the SE scale fit the construct model well between 0.6 and 1.4. Among the 18 items of SS, 17 items showed good-fit in both infit and outfit between 0.9 and 1.1 with all items measuring a single-construct. Item difficulty for SE ranged from 0.91 to 0.58 (logits), and SS items were from 1.39 to 1.66. No items showed evidence for differential functioning by the level of ID (Lee et al., 2010).

Physical Activity (Accelerometer & Pedometer): The GT1M Actigraph accelerometers (Flordia, USA) were used to determine physical activity intensity of the participants in relation to sedentary, light, and moderate to vigorous physical activity (MVPA). Accelerometers were chosen because they are practical and easy to use/operate. Additionally, motion detectors provide strong, objective measures of physical activity frequency, duration, and intensity, especially for those in free-living environments. According to a literature review on *Health-Promoting Physical Activity of Adults with Mental Retardation*, the accelerometer is a strong instrument to use for

those with ID, because there is no recall demand and many have successfully used this device within this population (Stanish et al., 2006).

According to Berlin, Storti, and Brach (2006) review of physical activity monitors in free-living conditions, accelerometers are a validated and reliable tool. Accelerometer validity has been approved for the older population, children, individuals who are obese, people with physical disabilities, slow gait speeds, ect. Additionally, accelerometers have been validated against direct observation (heart rate monitors and measures of energy expenditure). Reliability of Actigraph accelerometers was tested through test-retest for walking behavior and resulted in a correlation coefficient of $r = 0.85$ (Berlin et al., 2006).

The Omron HJ 720ITC Pedometer (Omron Health, Japan) were also used to measure physical activity behavior. This device monitors PA patterns in steps taken across weekdays, weekends, and hours of the day using time-stamped technology. The empirical results from Stanish's (2004) study showed that pedometer counts for those with ID were highly consistent with actual step counts during normal and fast paced walking on two ground surfaces. The data indicated that pedometers are accurate and a reliable measurement for assessing walking activity in adults with ID. The intraclass correlation coefficients were all above 0.95 supporting high levels of consistency between pedometer and hand counting. In addition, the Omron pedometer has been validated for use in slower walking populations (older adults and adults with Down Syndrome), validated on various walking surfaces (flat sidewalk, stairs, and mixed

surfaces), and has accuracy of step counts in various locations (waist, backpack, shirt pocket, and jacket) (Lee, Zhu, Yang, Bendis, & Hernandez, 2007; Pitchford & Yun, 2010; Zhu & Lee, 2010).

According to Stanish et al. (2006), the use of multiple measures of PA allows for a more comprehensive understanding of physical activity behavior, since single methods are limited in scope. Thus, the combined methods of motion sensors, pedometer, and self-reports instruments will likely provide the best assessment of the quality and quantity of movement for those with ID.

Procedures

In the initial visit, the researcher went through the informed consent process. The participant then completed the questionnaires (demographics, social support, and self-efficacy scales) with assistance from the lead researcher and proxy for those with ID. The questionnaires were administered by the researcher during face-to-face interviews (approximately 30 minutes in duration). The interview process was a three way answer seeking process, where the investigator asked the participant the question, the participant responded to the question, and the proxy, based on their familiarity with the participant, verified if the participant was providing accurate information. Additionally at this meeting, the participants learned how to wear the PA devices, and body composition assessments were measured (height, weight, waist, and hip circumferences). The participants wore the two devices for seven consecutive days

following the initial meeting. Nominal compensation was provided at the second meeting, when the participants returned the devices.

Statistical Analysis

Participants that wore devices for at least four days were included in data analysis. The data was additionally reviewed for non-wear time. According to Trost, Mciverm, and Pate (2005), four days of at least 10 hours of wear time is the amount of days and time necessary to accurately measure habitual physical activity behavior. Wear time in this study was determined by pedometer hourly data, and compared with accelerometer results. Days with less than eight hour wear time were deleted from data analysis. Younger adults with ID had an average wear time of 12 hours. Older adults with ID also averaged 12 hours of wear time, and older adults without ID averaged 14 hours of wear time. The percentage of the participants who worn the devices over 10 hours include: Younger adults with ID 83.7% (n=36), older adults with ID 85.2% (n=23), and older adults without ID 97% (n=32).

Subsequently, the normality of the data was examined using histograms, examining skewness and kurtosis. To examine the internal consistency of the SS and SE scales, Cronbach alpha was measured. Means and standard deviations of study variables were measured for each group and included in the correlation matrices in Tables 2, 3, & 4. A one-way analysis of variance (ANOVA) was used to examine the differences in physical activity levels, self-efficacy, and social support between groups. All alpha levels for the statistical significance were set at 0.05. Bonferroni

technique was used for multiple ANOVA analyses for each study parameter (PA, SE, & SS). Pearson correlations were applied to examine the relationships between SS and SE on PA levels by groups, and included in the correlation matrices in Tables 2, 3, & 4. Statistical analysis was conducted using statistical program, SPSS 18.0.

Results

Table 1 displays participants' demographic information. Differences were observed between those with ID and the older adults without ID in the following variables: age, education, living arrangement, income, working vs. non-working status, and martial status.

The Cronbach's alpha values for the four scales ranged from 0.87 - 0.76. The alpha value for the SE scale was 0.83, SS from family was 0.87, SS from staff was 0.74, and SS from peers was 0.76. Satisfactory reliability was found for all scales of self-efficacy and social support. There were no differential changes in reliability between individuals with and without ID. All three groups had satisfactory reliability in all four scales.

The univariate ANOVA statistic was used for physical activity constructs MVPA and pedometer steps. The Bonferroni adjusted p-value was $p < .025$. MVPA was significantly different between the three groups, $F = 6.633$, $p < .01$. The Tukey post hoc analysis showed younger adults with ID had significantly higher MVPA than older adults with ID, $p = .001$. *Figure 1: Mean Moderate to Vigorous Physical Activity*

displays the post hoc analysis graph for MVPA. The results in average minutes per day of MVPA are as follows: younger adults with ID =40 ± 35 minutes; older adults with ID =15± 17 minutes; older adults without ID =34 ± 31 minutes. MVPA was determined by adding the average minutes per day of moderate and vigorous activity determined by the accelerometer cutpoints (Freedson, Melanson, & Sirard, 1998). Pedometer steps were also significantly different between groups, F= 5.547, p<.01. Tukey post hoc analysis for walking steps showed older adults without ID (6109 ± 3031) and younger adults with ID (5926 ±2975) had significantly higher steps than older adults with ID (3864 ± 2061), p = .009 and p = .012, respectively. *Figure 2: Mean Pedometer Steps* displays the post hoc analysis graph for pedometer steps.

Self-efficacy for PA was significantly different between the groups, F =11.883, p <.001. Tukey post hoc analysis revealed statistically higher SE for PA, based on an 18 point scale, between the older adults without ID (15.82 ±2.35) and both groups of adults with ID, younger adults with ID (12.56 ± 3.75), p<.001 and older adults with ID (12.38 ± 3.61), p< .001. *Figure 3: Mean Self-Efficacy for Physical Activity* displays the post hoc analysis graph for self-efficacy.

The univariate ANOVA statistic was used three times for the social support constructs. The Bonferroni adjusted p-value was p < .016. There were no statistical differences for staff support between younger and older adults with ID. However, social support from family, based on an 18 point scale, was statistically different, F =4.592, p= .012, respectively. The Tukey post hoc analysis showed younger adults

with ID (11.82 ± 3.60) had significantly higher SS from family for PA than older adults with ID (9.41 ±3.92), p = .010. *Figure 4: Mean Social Support for Physical Activity: Family* displays the post hoc analysis graph for social support from family. Social support from peers, based on a 15 point scale, was also statistically different between groups, F = 4.812, p=. 010. Younger adults with ID (9.78 ±2.89) had significantly higher social support from peers for PA compared to older adults without ID (7.94 ±2.37), p < .01. *Figure 5: Mean Social Support for Physical Activity: Peers* displays the graph of the post hoc analysis for social support from peers.

Tables 2, 3, & 4 display Pearson correlation matrices for younger adults with ID, older adults with ID, and older adults without ID. Based on the study variables, the following associations were important to the study results and will be further examined in the discussion. Younger adults with ID had a negative association between SS for PA from family and age (r = -0.474). Older adults with ID showed the following trends: SE for PA had positive associations with pedometer steps and SS for PA from family (r = 0.411 & r = 0.407). SS for PA from staff shows negative trends for moderate PA (r = -0.335), vigorous PA (r = -0.465), and pedometer steps (r = -0.368). For older adults without ID, SE for PA was negatively associated with sedentary behaviors (r = -0.573), positively associated with moderate PA (r =0.389), pedometer steps (r = 0.390), and SS for PA from family (r = 0.486).

Discussion

Physical Activity Behavior

Moderate-to-Vigorous Physical Activity: According to the Centers for Disease Control and Prevention (2009), older adults, 65 years and older, are advised to accumulate 30 minutes of moderate exercise on most days of the week to receive improvements in physical functioning and health. The study results displayed in *Tables 2, 3, & 4: Correlation Matrices* show participants in the sample spent the majority of their time pursuing sedentary and light activities, approximately 11 hours per day of sedentary behaviors, and 3-4 hours of light activities on average per day. Based on the ANOVA, younger adults with ID had significantly higher MVPA than older adults with ID. However the proportions of each group achieving 30 minutes of moderate intensity physical activity were low for all groups. The proportions of each group achieving an average of 30 minutes of MVPA per day throughout the week were: younger with ID 35%; older with ID 4%; older without ID 23%.

Spirduso et al. (2005) explained that older adults do not need to participate in vigorous exercise to receive health benefits. However, a large amount of sedentary behavior can be detrimental to health. Current research by Owen, Healy, Matthews, and Dunstan (2010) demonstrated that sedentary behavior is a predictor of chronic disease, especially for increased risk of type II diabetes and cardiovascular disease. Additionally, prolonged sitting has a negative affect on energy expenditure and has

independent side effects on health despite meeting recommended guidelines of 30 minutes of moderate intensity activity most days of the week (Healy et al., 2007).

Therefore, when promoting PA in this population meeting recommended guidelines of 30 minutes of moderate intensity activity may not be a successful strategy. Focusing on moving and performing light physical activity throughout the day to purposefully reduce sedentary behavior would be recommended.

Pedometer Walking Behavior: Walking at various times throughout the day is a positive way to reduce sedentary behaviors. The results from this study show statistically higher pedometer steps for both younger adults with ID (5926 ± 2975) and older adults without ID (6109 ± 3031) compared to older adults with ID (3864±2061).

For those with ID, walking is the primary mode of transportation (Stanish et al., 2006). The jobs that adults with ID have also contribute to their physical activity, as most jobs include manual labor activities (bagging groceries, sweeping floors, raking leaves, janitorial, food services). Depending on the level of ID and productivity, adults with ID can work a few hours a day to an entire afternoon (Weston, 2002). As adults with ID increase in age, there will be more opportunities for retirement and perhaps decreased physical capacity to perform manual labor work, potentially decreasing planned PA. Therefore, unemployment for individuals with ID can not only decrease active engagement in society, but also lead to physical inactivity. An adult with ID's preference for sedentary behaviors also heightens the concern for decreased activity with unemployment. As Frey, Buchanan, & Sandt (2005) described, those with ID

lead routine and structured lives often planned around TV shows or sedentary activities.

Therefore, one potential contributor to lower PA in the older adults with ID is their employment status. Based on demographic information, younger adults with ID have a higher percentage of planned jobs to attend (88%) verses older adults with ID (51%). As a secondary data analysis, an univarate ANOVA determined significantly lower PA walking steps for adults with ID (both groups combined) who were non-workers (3755 ± 1690) vs. workers (5899 ± 3138), F= 7.225, p <0.01. Additionally, adults with ID who were nonworkers had significantly lower MVPA compared to those who were workers; 7 ± 6 minutes compared to 23 ± 20 minutes, F= 12.442, p <0.01. Older adults without ID have the highest percentage of nonworkers or retired individuals (88%). When this group was added to the ANOVA, no significant differences were determined between non-workers vs. workers for walking steps. Older adults without ID had no significance differences between nonworkers vs. workers for MVPA. Demonstrating, older adults without ID are pursuing PA out of preference verse necessity of transportation/ occupation. Unfortunately, adults with ID may only be pursuing PA out of necessity of employment instead of enjoyment or to receive health benefits.

Furthermore, according to Braddock, Hemp, and Rizzolo (2005), *The State of the States in Developmental Disabilities,* the percentage of individuals with intellectual or developmental disabilities served through employment services was only 24% in

2002. The sample in this study had higher percentages of employment due to higher levels of functioning (mild to moderate ID). Physical inactivity may be a larger concern for those with severe disabilities with less employment opportunities. Further research is needed to determine negative health outcomes associated with unemployment for adults with ID.

Another factor affecting PA for older adults with ID is reduced opportunities for meaningful leisure activities compared to younger counterparts with ID (Bigby, 2004). It is important for health promotion programs to focus on providing resources to first replace employment PA for those unemployed, and second to increase meaningful PA opportunities for those aging with ID. The overall low physical activity may part be due to personal preference, unemployment, or lack of opportunities. However, the evidence in this study suggests self-efficacy and social support could also be determinants of PA for those aging with ID.

Self-Efficacy for Physical Activity

Self-efficacy in relation to physical activity means one's belief they can perform physical activity even when faced with challenges. Self-efficacy stems from personal factors such as age, gender, health, and environmental factors which include safe facilities, transportation, and social support (Anderson, Wojcik, Winett, & Williams 2006). Factors in this study, age and social support are potential contributors to decreased efficacy for PA in adults with ID.

Based on a univariate ANOVA, older adults without ID had significantly higher SE for PA than both groups of adults with ID. SE for PA is shown to decrease with age in the general population (Anderson et al., 2006). This is a primary concern. Younger adults with ID, in this study, have significantly lower SE than the older adults without disability, demonstrating potential for a large gap in SE for younger adults with and without ID. Further comparative research is needed to determine the differences in SE for physical activity in younger adults with and without ID.

Tables 2, 3, and 4: Correlation Matrices show older adults without ID having stronger associations between SE and study variables than both groups of adults with ID. As previously mentioned, walking is the primary mode of transportation for those with ID. Further research is needed to determine if participants perceive lack of confidence in their abilities to perform leisure-time PA outside of employment related activity.

Although self-efficacy is a relatively new construct for adults with ID similar results for decreased SE were found in other studies. For instance, Heller, Hsieh, and Rimmer (2004) exercise intervention found at baseline half of the 53 adults with Down syndrome lacked self-efficacy in their abilities to increase their strength and flexibility. Qualitatively, Temple (2009) interviewed 13 active adults with ID to determine factors associated with PA. Perceived lack of personal skills was a barrier and contributor to physical activity in active adults with ID.

In addition, social support is shown to be a mediating factor for increased self-efficacy for older adults (Anderson et al., 2006). The results from this study support previous research findings, as Table 3 & 4 show significant positive associations between SE and SS from family for older adults with and without ID. Based on previous findings in aging research and for those with ID, the results depict that SS for PA from family is likely increasing older adults without and with ID's confidence to participate in PA (Anderson et al., 2006; Peterson et al., 2008b).

The results from the current study provide important information for public health interventions for older adults with ID. As Rimmer and Rowland (2008) described, if a person is going to be highly receptive to a health promotion intervention they must both have a disability-friendly environment, as well as, a strong personal interest and motivation to change behavior. According to the results of this study, younger and older adults with ID need programs to facilitate higher self-efficacy to empower them to respond to a health promotion program targeting PA.

Social Support for Physical Activity

Individuals with intellectual disabilities receive the majority of their social support from three groups of individuals: Family, staff, and friends (Robertson et al., 2001). Furthermore a study by Robertson et al. (2001) examined social networks of 500 adults with ID, and determined younger participants had larger social networks and were more likely to have a relative or a friend with ID in their network. This study further suggested an increased risk for social isolation for older adults with ID. Older

adults with ID have a unique transition in social relationships. As individuals with ID age and outlive their parents, siblings become their closest relatives and staff becomes the basis of their support system (Bigby, 2004). The change in social relationships as an individual with ID ages is critical when determining their basis of social support for physical activity.

Social Support: Family: The results from this study showed younger adults with ID had significantly more support for PA from family than older adults with ID. For younger adults with ID, the correlations displayed negative relationships between SS from family and age. Correlations potentially depict the importance of maintaining strong family supports as role models for older adults with ID(r = 0.407), as a way to increase self-efficacy for PA. Table 2 and 3 display the correlations between variables for younger and older adults with ID.

Younger adults with ID receive family support primarily from parents and siblings within the home. For individuals in the general population, transitioning out of the family home typically occurs upon maturity (e.g. attending college, obtaining a job, marriage, etc). In middle age, most individuals without ID have spouse support and potentially support from their children. A study by Whemeyer and Metzler (1995) suggested adults with ID do not have options to marry or have children. The perceptions of parents, staff, and special education teachers were unchanged in the Aunos and Feldman (2002) article where many of these supports agreed that those with ID should not marry or bear children. The population represented in this study is

mostly unmarried, as depicted in *Table 1: Participant Demographics*, potentially as a result of these thoughts and perceptions. Therefore, other family members (parents, siblings, etc), staff, and peers are the main sources of support for this population.

Social Support: Peers: Social support from peers was significantly lower for older adults without ID compared to younger adults with ID. This finding may be in part due to older adults without ID depending more on spousal support for PA. This was expressed often during the survey process, especially by older women without ID.

Another explanation for differences in peer support is adults with ID live in group home settings and have more interactions with roommates. Younger adults with ID are transitioning into group home settings at younger ages, typically after transitional services (age 21). At this time, younger adults with ID are able to create relationships with their roommates in group homes and maintain those relationships for long periods of time. Peers can be a strong social support for PA for those with ID, because of their everyday interactions with roommates. However, if roommates are living in similar environments with insufficient supports and role models all individuals involved could be at a disadvantage. Further research is needed to determine if increased staff support for PA could increase PA support among peers and roommates for those with ID.

Additionally, older adults with ID had lower support from peers than their younger counterparts. The lower peer support may in part be due to adults with ID being transitioned out of institutions or the family home at older ages due to inclusive

practices and/or outliving caregivers. Transitioning at an older age makes it more difficult to maintain existing friendships and create new relationships in an unfamiliar environment. Moorman and Greenfield (2010) described a similar situation for older adults without ID who transition into nursing homes and lose control of maintaining friendships in the community. This leads to negative effects on health and possible isolation. More research is needed to determine the health effects of transitioning into a group home or nursing home for older adults with ID.

Social Support: Staff: Results from this study demonstrate significant correlations between social support from staff and PA behavior. *Table 3: Correlation Matrix: Older Adults with ID* shows with higher SS for PA from staff there is a positive association for sedentary behavior and negative relationships with physical activity (moderate, vigorous, and pedometer steps).

Some critical explanations for the negative associations between SS from staff and PA are as followed. First, it may be difficult for adults with ID to develop a supportive relationship with their staff, due to the high turnover rates. Staff turnover has been identified in literature to be a barrier to quality care and health status of those with ID (Krahn et al., 2006). Secondly, perhaps staff are not using appropriate tactics in approaching older adults with ID about PA, and/or not being effective role models.

Qualitative studies have been conducted to determine the influence of social support by examining staff and participants' perceptions about physical activity. Frey et al. (2005) study revealed a salient barrier unique to this population, "negative

supports" for PA. There were caregivers, coaches, teachers, and other role models reinforcing sedentary behaviors for reasons consisting of lack of knowledge about physical activity, fear for their safety, ignorance that this population can improve health, and lack of time to take individuals to active programs. Krahn et al. (2006) also describes that residential settings supporting inactivity and poor nutrition is a factor that contributes to the observed poor health of those with ID. Health promotion programs focusing on increasing SS from staff and creating better role models would be a primary way to change behavior in this population.

Limitations

Physical Activity Wear Time: The amount of time the participants wore the physical activity devices is important to note when discussing PA intensities and walking behaviors. *Tables 5, 6, 7: Physical Activity by Wear Time* displays the physical activity of the participants who wore the devices an average of 8-10 hours, 10-12 hours, 12-14 hours, and over 14 hours during the day. Upon further secondary data analysis, there were no statistical differences between the amount of walking steps taken among the categories of wear times for younger adults with ID (F= 1.270, p< 0.298) and older adults without ID (F=2.626, p < 0.069). Older adults with ID showed significant differences between wear time and physical activity walking steps (F= 5.118, p< 0.01), specifically between 8-10 hours of wear time and wear time over 14 hours (p<0.01) and 10-12 hours and over 14 hours of wear time (p<0.05). Thus, a limitation exists when determining how to compare participants with 8-12 hours of

wear time and those who wore the devices over 14 hours during the day. Additionally examining Tables 5, 6, and 7, one can observe potential differences between wear time and PA intensities. Therefore, the limitation of wear time when interpreting PA, in any study involving devices to be worn across the duration of a day, should be acknowledged.

Validation of Accelerometer Cut-Points: Additionally, accelerometers have been validated for use in older populations (Berlin et al., 2006). However, the accelerometer solely measures movement, therefore does not take into account the physiological response to activity. Physiologically, older adults' have decreased maximum heart rate, overall less muscle mass to exercise at higher intensities, decreased ability to redirect blood from organs to muscles, and a decreased efficiency of muscles to utilize oxygen (Spirduso et al., 2005). Thus, older adults may perform lighter activity at higher intensities. It is noted, the 2003-2004 National Health and Nutritional Examination Survey (NHANES) used accelerometers to measure PA across all age groups, including older adults, to determine PA intensity with the cutpoints specified for the adult population (Troiano, Berrigan, Dodd, Masse, Tilert, & McDowell, 2008). Nevertheless, the acknowledgment of the validity of intensity cutpoints for older adults is important for HP interventions designed to increase PA in older adults. Until accurate cutpoints are determined, the focus of interventions should be based on decreasing sedentary time and increasing light intensity activities such as

walking and routine activities of daily living (washing dishes, cleaning house, gardening, etc).

Self-Reports and Proxy Measures: In addition, self-reports and proxy measures are often criticized in the older population and for those with ID due to their reliance on cognition and recall. The scales used in this study have evidence of reliability and validity in the ID population, and were derived from valid scales used for those without ID (Peterson et al., 2009b). Although a proxy may be a limitation due to their under recognition of health concerns (Krahn et al., 2006), they have been shown to increase the accuracy of the results for those with ID (Temple & Walkey, 2003). Thus, the surveys and proxies were used in this study based on the psychometric properties of the surveys, and to gain the most accurate information on participants' behavior and demographics.

Differentiating Severity of Intellectual Disability: Another limitation in this study is the lack of specific IQ for individuals with ID. The agencies were able to determine if the participant had mild to moderate intellectual disabilities, as well as, the lead researcher confirming severity based on responsiveness to questions. The following were the researcher's expectations for IQ and responsiveness during the survey process. If the participant could not respond to questions (non-verbal), could not comprehend questions asked, highly agreeable to all questions (stating yes or no for all responses),or if the majority of the responses were inconsistent with proxy's understanding of the participant, then the participant was not used in data analysis.

Therefore, without specific IQs the researcher was unable to analyze the differences between mild and moderate ID in relation to study variables. In addition, the results of this study can not be generalized to the entire population of ID, because those with severe and profound ID were not included in the sample. Based on the literature, individuals with severe ID age at a quicker rate and have higher risk for premature death, because of the presence of other serious associated conditions. Having a severe ID is also associated with limited mobility and lower levels of functioning (Bigby, 2004).

Future Directions in Health Promotion for Older Adults with ID

Further Preparation for Health Promotion Intervention: The development of focus groups through triangular qualitative methods with older adults with ID, staff, and family may provide further explanations about the quantitative results observed in this study. Rimmer, Riley, Wang, Rauworth, and Jurkowski (2004) developed methodology to examine multiple groups as it related to barriers and facilitators for PA participation for persons with disabilities. Focus groups may be a useful way to gain multiple perspectives about the psychological and environmental barriers and facilitators to PA for older adults with ID. In addition, Drum et al. (2009b) HP guidelines specify that caregivers and family should be part of the development and implementation of HP interventions. Therefore, asking each group what would motivate them to participate in a physical activity HP intervention should also be included in the focus group discussion.

Health Promotion Conceptual Model: As a way to bridge current evidence to a HP intervention, *Figure 6 Rimmer and Rowland's (2008) Health promotion dyad for people with disabilities: Empowering the person and enabling the environment* could be a useful tool. This model could be implemented along with the social cognitive theory to further theory-based HP interventions for older adults with ID.

This model emphasizes the social model of disability, where the disability is shifted from the individual (underlying condition/impairment) and is placed on the barriers faced when interacting with the environment. The key factor for this HP disability model is that both sides of the dyad need to be addressed to achieve optimal health outcomes (Rimmer & Rowland, 2008). Below are suggestions for enabling the environment and empowering the person for those aging with ID.

Enabling the environment: The interactions with the environment differ for various disabilities (Peterson, et al., 2009a). Temple (2009)'s qualitative research describes how adults with ID depend on social supports to "show them how" to be active and to be active role models. If role models (staff and family), do not value the benefits of a healthy lifestyle themselves, then those with ID may follow similar paths and continue practicing negative lifestyle behaviors (Heller, Hsieh, & Rimmer, 2002). Thus, the importance of education and PA behavior change should not only be targeted to the individual with ID, but also with their "role models." Determining ways to incorporate a HP intervention for both the individual with ID and their supports would be the optimal way to change behavior.

Empowering the Person: A successful health promotion intervention should empower people with disabilities to better manage their own health. For those with ID, a HP intervention should teach individuals with ID how to play an active role in achieving better health. As evident in Heller, Mark, and Ailey (2001) HP program *Exercise and Nutrition Health Education Curriculum for Adults with Developmental Disabilities*, adults with ID were able to learn strategies and personal skills that resulted in increased self-efficacy for exercise, development of goals and preference-based plans for PA and nutrition, and positive outcome expectations for health promoting behaviors. This program focused on empowering the person with ID through health education. Future HP intervention for those with ID should also focus on increasing SE through the development of personal skills and successful strategies to resolve problems and overcome barriers, rather than only providing solutions or offering assistance (Rimmer & Rowland, 2008).

Conclusion

According to Stanish et al. (2006), the lack of data on promotion for physical activity in those with ID has significant concerns for three reasons. First, healthcare costs for inactivity of the general population estimates $75 billion in the United States. There is currently no data for the cost of inactivity for those with ID, but the medical and nonmedical costs associated with the diagnoses of ID (e.g., physician visits, inpatient hospital stays) are estimated over $12.3 billion (Honeycutt et al., 2004). Second, indirect costs of inactivity such as premature death, lost wages, and work

limitations are estimated over $38 million and account for 76% of the total lifetime costs related to ID diagnoses. It is reasonable that a portion of these costs are related to inactivity. The third reason is even though the emotional and social aspects are difficult to assess for inactivity, individuals with ID express desire for control of their lives (Stancliffe, 2001). If inactivity is an indicator of health, then independence will be compromised with lack of PA.

This research study has provided a snapshot of PA, SE, and SS in older adults with ID compared to younger adults with ID and older adults without ID. It also provides suggestions for use of a conceptual model for HP interventions for adults with ID. In addition to the suggested conceptual model, guidelines have been developed to effectively implement HP interventions for those with disabilities (Drum et al., 2009b). These guidelines were developed by experts in the disability, public health, and other associated fields to assist the implementation of HP interventions and programs for individuals with disabilities. These guidelines can be found at, http://www.ohsu.edu/oidd/rrtc/, and are strongly encouraged to use as the best available set of practices for implementing HP programs for those with disabilities. Furthermore, there are few, if any, HP interventions targeted for those aging with a disability. By establishing effective health promotion programs, we can increase healthy behaviors that reduce secondary conditions, increase functioning, and increase quality of life for those aging with a disability.

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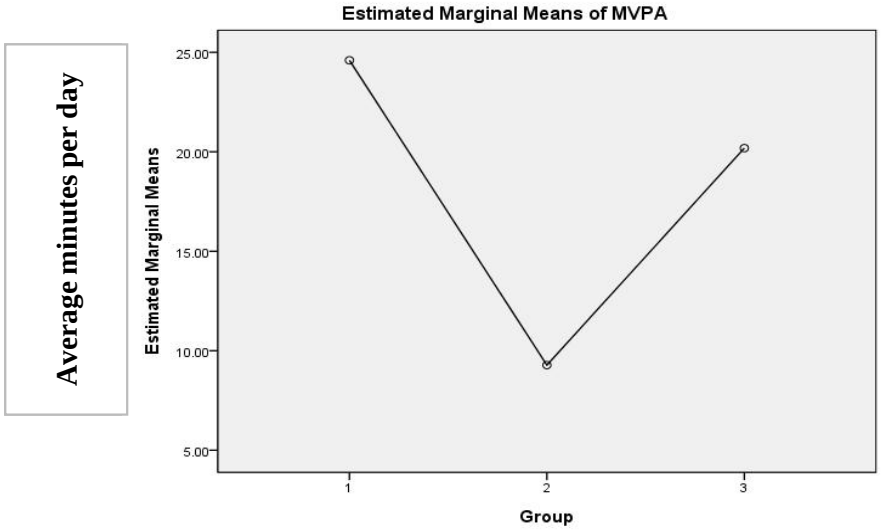
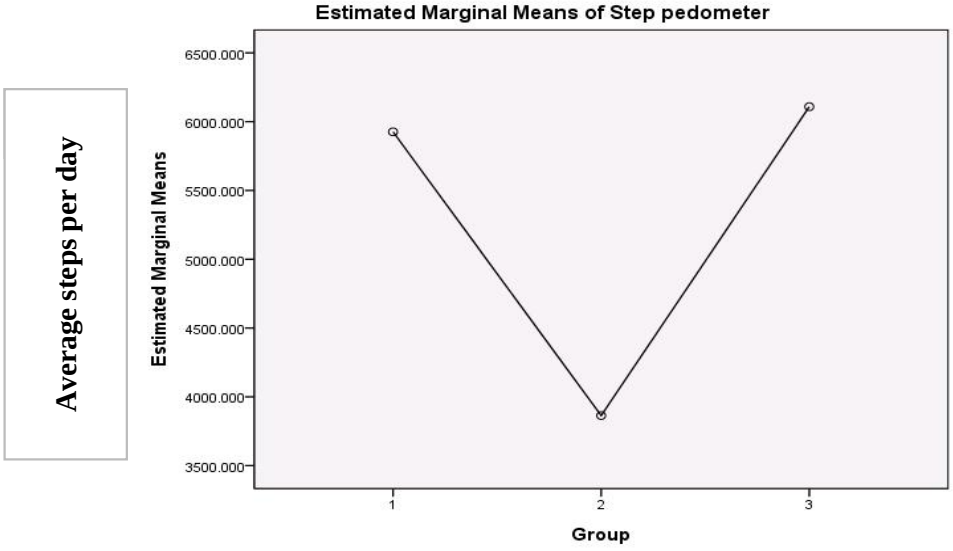
Figure 1: Mean Moderate to Vigorous Physical Activity



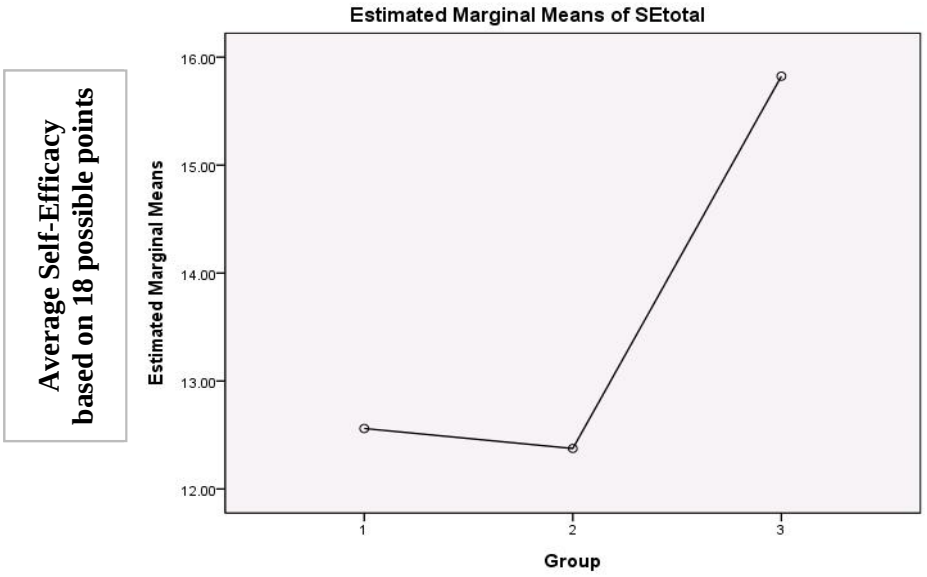
Group 1: Younger Adults with ID; **Group 2**: Older Adults with ID;
Group 3: Older Adults without ID

Figure 2: Mean Pedometer Steps



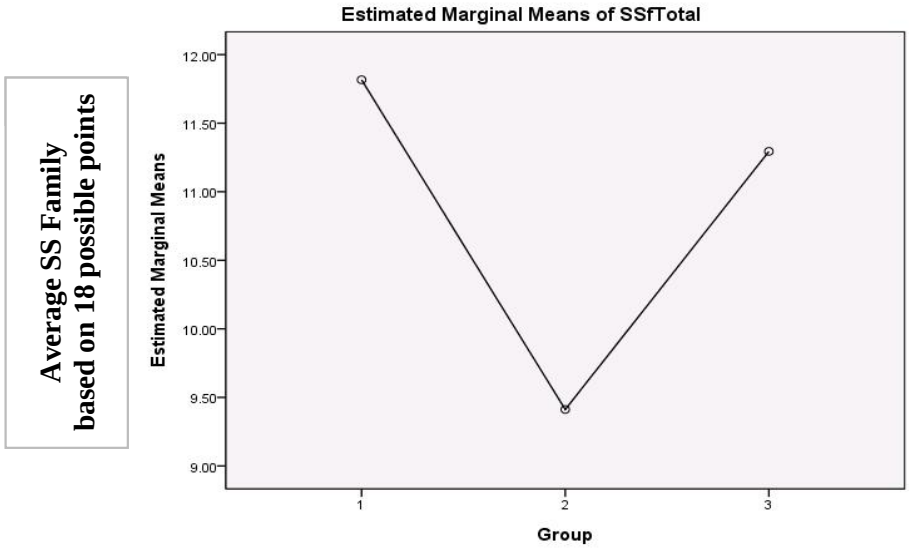
Group 1: Younger Adults with ID; **Group 2**: Older Adults with ID;
Group 3: Older Adults without ID

Figure 3: Mean Self-Efficacy for Physical Activity



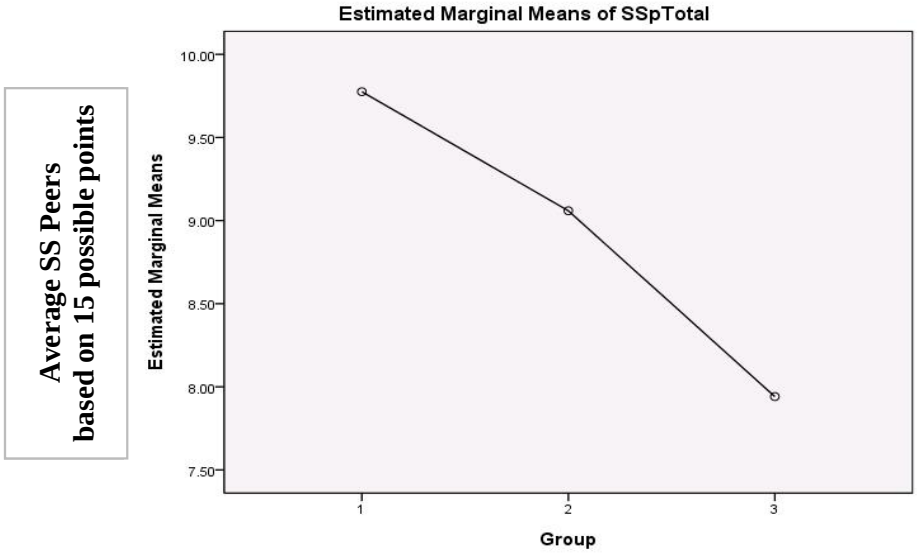
Group 1: Younger Adults with ID; **Group 2**: Older Adults with ID; **Group 3:** Older Adults without ID

Figure 4: Mean Social Support for Physical Activity: Family



Group 1: Younger Adults with ID; **Group 2**: Older Adults with ID; **Group 3:** Older Adults without ID

Figure 5: Mean Social Support for Physical Activity: Peers



Group 1: Younger Adults with ID; **Group 2**: Older Adults with ID; **Group 3**: Older Adults without ID

Figure 6: Rimmer and Rowland (2008)

Health Promotion dyad for people with disabilities:

Empowering the person and enabling the environment

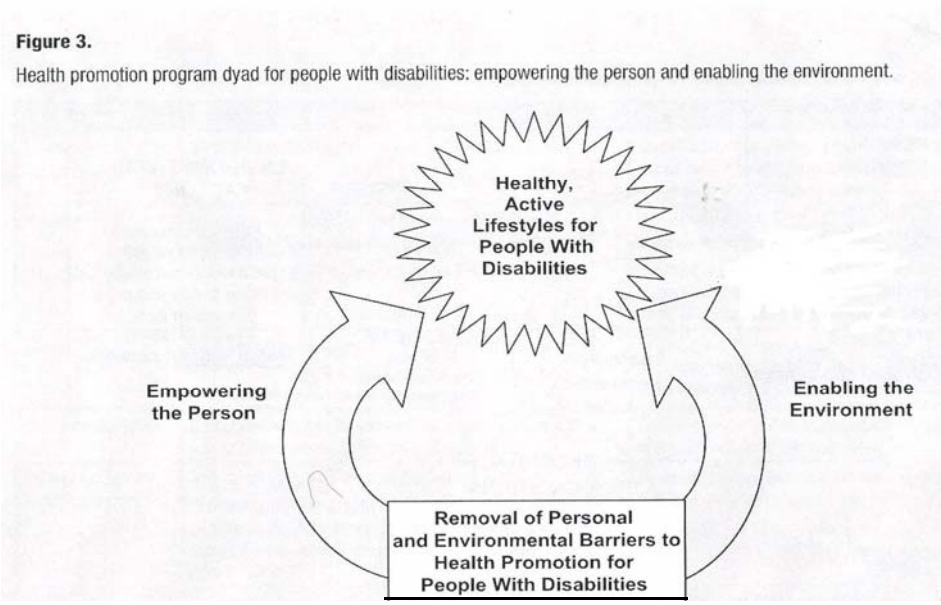


Table 1: Participant Demographics

Variable		Adults w/ ID (N = 49)	Older Adults w/ ID (n= 35)	Older Adults (n= 34)
Age (range)		20-49	50-77	65-89
	Mean	32.67	57.89	72.94
	SD	8.77	6.61	5.92
Gender (n, %)				
	Male	26 (52%)	22 (63%)	16 (47%)
	Female	23 (46%)	13 (37%)	18 (53%)
Height (range)		48.8 -78.00	54.25-73.00	59.00-73.50
	Mean	63.84	63.26	66.07
	Sd	6.06	4.94	3.87
Weight (range)		89.54- 280.00	103.00-230.00	112.60- 273.20
	Mean	164.46	154.93	162.10
	SD	45.22	37.59	36.04
BMI (range)		16.72-44.09	17.72- 48.06	19.40- 54.71
		28.21	27.38	26.19
		6.02	6.56	6.39
Waist to Hip (range)		0.75- 1.12	0.69- 1.08	0.72- 1.04
	Mean	0.87	.90	.87
	SD	0.08	.10	.10
No. Medical (range)		1.0-2.0	1.0-5.0	1.0-4.0
Conditions	Mean	0.38	.66	1.06
	SD	0.57	1.11	.89

Variable		Adults w/ ID (N = 49)	Older Adults w/ ID (n= 35)	Older Adults (n= 34)
Ethnicity (n, %)				
	Caucasian	48 (98.0%)	32 (91.4%)	34 (100%)
	Afican American	*	2 (5.7%)	*
	Asian	*	1 (2.9%)	*
	Aboriginal	1 (2.0%)	*	*
Living Arrangement (n, %)				
	Independent	3 (6%)	3 (8.5%)	33 (97.1%)
	Independent w/assistance	5 (10%)	9 (25.7%)	
	Group home/foster home	31 (62%)	23 (65.7%)	*
	Home w/ family	11 (22%)	*	1 (2.9%)
Education (n, %)				
	Grammar school	1 (2%)	9 (31.0%)	*
	High school/ equivalent	41 (85.4%)	12 (41.4%)	2 (5.9%)
	Vocational/ technical	1 (2%)	1 (3.4%)	*
	Some college	3 (6%)	*	7 (20.6%)
	Bachelors degree	*	*	10 (29.4%)
	Masters degree	*	*	10 (29.4%)
	Doctoral degree	*	*	5 (14.7%)
	Life skills training	*	7 (24.1%)	*
Income (n, %)				
	<10,000	25 (51.0%)	17 (48.6%)	*
	$10,000-$19,999	3 (6.1%)	11 (31.4%)	*
	$20,000-$39,999	1 (2%)	1 (2.9%)	7 (20.5%)
	$40,000-74,999	1 (2%)	*	12 (35.3%)
	$75,000- $100,000	*	*	10 (29.4%)
	Rather not say	19 (38.9%)	6 (17.1%)	5 (14.7%)

Variable		Adults w/ ID (N = 49)	Older Adults w/ ID (n= 35)	Older Adults (n= 34)
Marital Status (n, %)				
	Single	48 (96%)	30 (85.7%)	*
	Married	*	3 (8.6%)	31 (91.2%)
	Divorced	1 (2%)	1 (2.9%)	1 (2.9%)
	Separated	1 (2%)	*	*
	Widowed	*	1 (2.9%)	2 (5.9%)
Working (n, %)				
	Workers	44 (88%)	18 (51.4%)	4 (11.8%)
	Nonworkers	6 (12%)	17 (48.6%)	30 (88.2%)

Table 2: Correlation Matrix : Younger Adults with ID

		Mean	SD	1	2	3	4	5	6	7	8	9	10
1	Sedentary	19.58	1.58	1									
2	Light	3.70	1.38	-.886**	1								
3	Moderate	.36	.32	-.585**	.346**	1							
4	Vigorous	.01	.01	-0.239	0.166	.380*	1						
5	Steps	5219.44	2905.68	-.610**	.486**	.829**	0.267	1					
6	SE ^	12.69	3.77	0.055	0.015	-0.041	0.036	0.077	1				
7	SSfamily#	14.04	4.03	0.158	-0.19	-0.134	-0.053	-0.104	0.075	1			
8	SSstaff#	14.24	3.04	-0.126	0.107	-0.026	0.077	-0.171	0.175	0.139	1		
9	SSpeer#	9.71	2.96	-0.249	0.198	-0.030	-0.075	0.039	0.192	-0.030	0.095	1	
10	Age (years)	32.00	8.29	0.102	-0.084	-0.045	-0.091	-0.059	-0.057	-.474**	-0.159	0.019	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

^ SE self-effiacy; # SS social support

Note: Activity intensities (sedentary, light, moderate, and vigorous) are average hours per/day

Steps are average steps per/day

SE scale is out of 18 possible points; SS family is 18 point scale; SS staff is 18 point scale; SS peer is 15 point scale

Table 3: Correlation Matrix: Older Adults with ID

		Mean	SD	1	2	3	4	5	6	7	8	9	10
1	Sedentary	11.92	1.51	1									
2	Light	3.87	1.40	-.975**	1								
3	Moderate	.15	.16	-.419*	0.292	1							
4	Vigorous	.00	.01	-0.308	0.127	0.231	1						
5	Steps	3863.66	2061.10	-.696**	.580**	.730**	0.396	1					
6	SE ^	12.38	3.61	0.012	-0.058	0.160	0.087	0.411	1				
7	SSfamily#	9.41	3.92	-0.171	0.105	-0.056	0.365	0.124	.407*	1			
8	SSstaff#	13.97	2.78	0.071	0.068	-0.335	-.465*	-0.368	0.009	-0.045	1		
9	SSpeer#	9.06	2.55	-0.307	0.261	-0.054	.411*	0.292	0.277	0.186	-0.042	1	
10	Age (years)	57.89	6.61	0.104	-0.077	0.049	-0.250	-0.088	0.089	-0.263	0.132	-0.195	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

^ SE self-effiacy; # SS social support

Note: Activity intensities (sedentary, light, moderate, and vigorous) are average hours per/day

Steps are average steps per/day

SE scale is out of 18 possible points; SS family is 18 point scale; SS staff is 18 point scale; SS peer is 15 point scale

Table 4: Correlation Matrix: Older Adults without ID

		Mean	SD	1	2	3	4	5	6	7	8	9
1	Sedentary	11.48	1.27	1								
2	Light	4.19	1.15	-.979**	1							
3	Moderate	.32	.26	-.530**	0.35	1						
4	Vigorous	.02	.05	-0.219	0.138	0.267	1					
5	Steps	6108.56	3031.18	-.697**	.582**	.802**	0.214	1				
6	SE ^	15.82	2.35	-.573**	.543**	.389*	0.086	.390*	1			
7	SSfamily#	11.29	3.38	-0.347	.368*	0.099	-0.135	0.014	.486**	1		
8	SSpeer#	7.94	2.37	-0.194	0.197	0.086	-0.023	0.177	0.253	0.165	1	0.082
9	Age (years)	72.94	5.92	.450*	-.420*	-0.339	-0.051	-.433*	-0.055	0.214	0.082	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

^ SE self-effiacy; # SS social support

Note: Activity intensities (sedentary, light, moderate, and vigorous) are average hours per/day

Steps are average steps per/day

SE scale is out of 18 possible points; SS family is 18 point scale; SS staff is 18 point scale; SS peer is 15 point scale

Table 5: Younger Adults with ID Physical Activity by Wear Time

	8-10 hours			10-12 hours			12-14 hours			>14 hours		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Sedentary	7	1201.57	97.44	11	1152.75	70.46	16	1159.58	72.43	8	1103.45	79.56
Light	7	191.35	39.17	11	253.04	55.46	16	255.53	54.38	8	303.95	66.12
Moderate	7	24.96	25.10	11	26.89	19.11	16	18.94	13.05	8	31.92	30.53
Vigorous	7	.57	1.51	11	.18	.28	16	.08	.25	8	.66	1.39
Steps	7	5435.41	3639.14	12	5675.30	3022.16	16	5418.08	2094.52	8	7746.81	3642.83

Note: Activity intensities (sedentary, light, moderate, and vigorous) are average hours per/day
Steps are average steps per/day

Table 6: Older Adults with ID Physical Activity by Wear Time

	8-10 hours			10-12 hours			12-14 hours			> 14 hours		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Sedentary	4	20.83	74.76	7	20.16	84.88	12	19.60	74.53	3	16.95	42.69
Light	4	3.12	71.13	7	3.66	81.55	12	4.14	62.39	3	6.08	87.57
Moderate	4	.05	3.76	7	.18	8.74	12	.26	19.79	3	.50	29.55
Vigorous	4	.00	.00	7	.00	.00	12	.00	.48	3	.03	2.13
Steps	4	1857.51	1570.09	7	3448.59	1598.51	13	4894.50	3091.44	3	9239.22	3152.40

Note: Activity intensities (sedentary, light, moderate, and vigorous) are average hours per/day
Steps are average steps per/day

Table 7: Older Adults without ID Physical Activity by Wear Time

	8-10 hours			10-12 hours			12-14 hours			> 14 hours		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Sedentary	1	22.55	.	1	21.82	.	12	19.99	58.87	16	18.75	48.06
Light	1	1.45	.	1	2.15	.	12	3.66	48.58	16	4.88	44.48
Moderate	1	.00	.	1	.03	.	12	.33	19.25	16	.35	12.03
Vigorous	1	.00	.	1	.00	.	12	.02	1.84	16	.02	3.84
Steps	1	867.00	.	1	1611.43	.	13	5689.27	3152.06	18	6952.41	2566.65

Note: Activity intensities (sedentary, light, moderate, and vigorous) are average hours per/day
Steps are average steps per/day

APPENDIX A

LITERATURE REVIEW

REVIEW OF LITERATURE

Introduction

The overall age demographics of the United States will change considerably within the next 50 years. As the “baby boomers” age, the prevalence of the older population will also rise drastically. By 2050, there will be 80 million older adults, which is 1 in 5 individuals b

eing 65 years or older (Perkins, Multhaup, Perkins, & Barton, 2008). With advanced age comes, increased risk for functional disability, co-morbid conditions, and chronic conditions leading to an overall lack of quality of life (Elavsky et al., 2005).

Individuals with intellectual disabilities (ID) are also becoming a larger visible subset of our aging population. The life expectancy of individuals with ID has increased drastically in the past century. For example, the life expectancy in 1930 was 20 years for those with ID, and as of 2005 has increased to an average of 66.1 years (Fisher & Ketti, 2005; Hatzidimitriadou & Milne, 2005). Now, younger adults with intellectual disabilities are expected to live as long as their non- ID peers, 76.9 years (Bigby, 2004; Fisher & Ketti, 2005). Since individuals with mild to moderate intellectual disabilities are beginning to have similar life spans to the general population, they are also developing many of the same chronic illnesses such as cardiovascular disease, diabetes, heart disease, and cancer (Bigby, 2004; Bittles, Petterson, Sullivan, Glasson, & Montgomery, 2002; Fisher & Ketti, 2005).

Estimates suggest that individuals with intellectual disabilities make up 0.4% of the general population, 55 years and older, and will increase in the future as individuals with ID continue to increase their life expectancy (Bigby, 2004). According to the literature, a threshold age of 50 years has been set for the beginning of 'old age' for individuals with ID (Grant, 2001; Hatzidimitriadou & Milne, 2005). Depending on the severity and type of the disability, many live with high levels of functional capabilities until at least 50 years of age. Those with severe disabilities or complex needs may experience age-related affects as early as 30 years of age (Hatzidimitriadou & Milne, 2005). Overall, individuals with ID are living longer than they did in the past, for instance, in a study conducted by Bittles, et al., (2002) a recruited participant with ID was over 96 years of age.

With the potential for longevity, an explanation is needed to why those with ID are experiencing premature aging and poor health. One explanation is genetic factors contributing to higher rates of associated conditions. Associated conditions are medical conditions that have led to the impairment, for instance, individuals with Down syndrome experience higher rates of Alzheimer disease and thyroid conditions. Another reason for decreased health is social circumstances. Those with ID are characterized by having lower income, increased social isolation, vulnerability to abuse, and decreased attention for health care needs. Inadequate health care access is another contributor to decreased health through poor management of associated health conditions and late diagnosis of comorbid and secondary conditions. Comorbid conditions are health problems unrelated to underlying disease or disability that also

have an adverse impact on health. For instance, cancer and hypertension are considered comorbid conditions. Secondary conditions are conditions that persons with certain preexisting disabilities experience at a higher rate than the general population and are often preventable. Common secondary conditions for those with ID are bowl obstructions and depression. Lastly, individual behaviors contribute to poorer health. For those with ID, this is often due to the lack of acquired knowledge about healthy choices, residential facilities supporting poor nutrition and physical inactivity, and inaccessible health promotion programs for high risk behaviors like smoking, sexual activity, alcohol abuse, and physical inactivity (Krahn, Hammond, Turner, 2006).

Physical Activity and Aging

Decreased functioning and disease is often mistaken for primary aging or the evitable process of growing older. Primary aging, *the aging process*, is universal changes with age. It is the gradual and inevitable process of body deterioration that takes place throughout life. This is the accumulation of biochemical damage that occurs just by aging. In older adults, this may lead to slowed movements, faded vision, impaired hearing, or a reduced ability to adapt to stress. Secondary aging, *process of aging*, results from disease and poor lifestyle practices. It is the effects of both the environment and disease. This type of aging is often preventable through changes in lifestyle and modern medicine. Therefore, changing negative lifestyle behaviors (e.g physical inactivity) is a positive way to manage and control the rate of the aging process (Spirduso, Francis, & MacRae, 2005).

Older adults can continue to see benefits from physical activity (PA) later in life. Physical activity has the capability to change the progression of physical decline associated with age (Perkins et al., 2008). Studies have shown that with PA and exercise, older adults can increase their strength, increase functional performance, and lose weight. Other health benefits from PA include reductions in the risk of coronary heart disease, diabetes, hypertension, obesity, as well as, improvements in bone health and muscle mass. Additionally, physical activity allows older adults to maintain their independence and perform activities of daily living; thus, leading to an improved quality of life (Mazzeo & Tanaka, 2001). Furthermore, physical inactivity is described as a risk factor for physical decline in older adults (Booth et al., 2000). It is estimated that half of the decline in older adults, in general, is due to their physical/mental disuse and lack of exercise rather than to illness or biological change (Bigby, 2004).

Evidence also supports that physical activity is associated with positive psychological health, for example decreasing symptoms of depression. Depression is a large concern in the older population. According to the World Health Organization, within this century, depression will be the leading cause of early death/disability among adults in the developed world (Fiatarone Singh, 2004). Depression is also a condition with high prevalence for individuals with ID, and often misdiagnosed in this population. Depression for those with ID is due to multiple interacting factors including lack of social support, poor social skills, lack of stimulating environments, brain damage, medical and physical problems, and the inability to think adaptively about themselves and their world. The rate of mental illness in older adults with ID

exceeds that of their younger peers, and is four times higher than older adults without ID (Bigby, 2004).

According to Fiatarone Singh's (2004) article, physical activity was shown to be associated with more positive psychological attributes and lower prevalence of depressive symptoms in cross-sectional, prospective epidemiologic studies, and experimental trails. PA is effective in reducing depressive symptoms in both young and older adults, and can be approximately as successful as antidepressants (Fiatarone Singh, 2004).

According to the Centers for Disease Control and Prevention (2009), older adults, 65 years and older, are advised to accumulate 30 minutes of moderate exercise on most days of the week to receive improvements in physical functioning and health. The *Physical Dimensions of Aging* text by Spirduso et al., (2005) further explains that older adults do not need to participate in vigorous exercise to receive health benefits. In fact, the biggest predictor of extended longevity was simply not being in the lowest fit category or participating in no physical activity. Therefore, 30 minutes of walking accumulated throughout the day is sufficient for older adults to receive positive health benefits (Spirduso et al., 2005).

Moreover, the benefits of physical activity and exercise are demonstrated through many resources and have been proven to promote successful aging (Centers for Disease Control and Prevention, 2009; Fiatarone Singh, 2004; Mazzeo & Tanaka, 2001; Spirduso, Francis, & MacRae, 2005). However, knowing the benefits of regular physical activity is not enough to change the behaviors of the older population. The

aging population, 65 years and older, is one of the most sedentary populations with 60% not participating in any leisure-time physical activity and only one fifth participating in enough physical activity to lead to health benefits (Hughes, Seymour, Campbell, Whitelaw, & Bazzarre, 2009; Lee, Arthur, & Avis, 2008). These statistics emphasize the risk for rapid secondary aging for older adults, and further demonstrate the need for health promotion research in the area of PA and aging.

Physical Activity: Adults Aging with Intellectual Disabilities

Similar to the general population, physical activity is expected to be lower in older adults with intellectual disabilities. Unlike the general population, physical activity has not been explored for those aging with ID (50 + years) (Stanish, Temple, & Frey, 2006). Therefore, it is uncertain the actual physical activity patterns of this aging population. Bigby (2004) article suggests that individuals aging with ID have reduced opportunities for meaningful leisure activities compared to their younger counterparts, possibly contributing to a less active lifestyle.

To further understand the physical activity patterns of adults with ID, the following eight studies examined PA according to current published recommendations of 30 minutes of moderate activity on most days of the week or 10,000 steps per day guideline (Draheim, McCubbin, & Williams, 2002a; Draheim, Williams, & McCubbin, 2002b; Draheim, Williams, & McCubbin, 2003; Frey, 2004; Stanish & Draheim, 2005a; Stanish & Draheim, 2005b; Temple, Anderson, & Walkley, 2000; Temple and Walkley, 2003). According to Stanish, et al (2006) review article, there are large variability in the following eight studies. Based on the limited findings, they

concluded that less than one-third of the population with ID engages in sufficient enough PA to receive health benefits.

The studies using accelerometer technology determined frequency, intensity, and duration of physical activity behaviors for adults with ID. Temple and Walkey (2003) study included 37 adults with mild to moderate ID ages 19-60 years. Data from the accelerometer and a PA diary recall from a proxy were collected for three days. The results showed that 32% of the participants in the study met the recommended 30 minutes of moderate intensity physical activity per day (Temple & Walkey, 2003). Frey (2004) study found similar results when using the accelerometer. Participants wore the physical activity device for 22 days and were compared to age and gender matched controls. Two groups of controls were used in this study as comparisons, an active control group and a sedentary control group. The results showed that those with ID accumulated less minutes of moderate to vigorous physical activity than both the sedentary and active controls. The results in average minutes per day of moderate to vigorous physical activity are as follows: ID =19.7 minutes; sedentary control =31.6 minutes; active control =55.9 minutes. The proportions of each group achieving 30 minutes of moderate intensity physical activity were: ID 28%; sedentary controls 47%; active controls 89% (Frey, 2004).

Other studies have evaluated walking behaviors of adults with ID with the use of pedometers. Walking is the primary mode of transportation for many individuals with ID, making pedometer steps an obvious measure of physical activity in this population. According to Stanish et al. (2006) article, individuals who accumulate

over 10,000 steps per day have less body fat and lower blood pressure than less active individuals. In the Stanish and Draheim (2005a) study, walking patterns were examined in 103 adults with ID. The results showed those with ID walked an average of 7,832 steps per day, with only 21% meeting the 10,000 steps per day guideline. Stanish's (2004) study of 20 adults with mild ID, showed significantly less walking steps on the weekends, than weekdays with only 20% reaching the 10,000 criteria on weekends and 45% of the participants reaching the criterion on weekdays.

To build on previous research of walking patterns for adults with ID, Peterson, Janz, and Lowe (2008) study used time-stamped technology to measure PA across weekdays, weekends, and hours of the day. The study consisted of a large sample of 131 adults with mild to moderate ID who wore the pedometer for seven consecutive days. The results showed only 20 participants (15.3%) achieved the public health guideline of 10,000 steps per day. Adults with ID were more active during weekdays verse weekend days, with more steps during morning and afternoon time periods. One explanation given for these walking patterns were fewer work and organized activity options in the evenings and on the weekends, leading to decreased steps. This study demonstrates the need for health promotion interventions to focus on evening hours and weekends to increase leisure-time physical activity in this population. Although undetermined, decreases in overall PA may occur in older adults with ID who no longer work and lack planned activities. Further studies are needed to determine if physical inactivity is due to personal preference or the lack of social supports, self-efficacy, resources, and opportunities (Peterson et al., 2008a).

As previously explained, the vast majority of those with ID are not getting the recommended amount of PA needed to receive health benefits and prevent secondary conditions. The *Healthy People 2010* report noted that more individuals with disabilities, 56%, reported no leisure-time physical activity than 36% of the general population. The report suggests that environmental factors like architectural, knowledge barriers, social support, and polices/procedures may be the reasons for the differences in physical activity (US Department of Health and Human Services, January 2000). When compared to the older population, those with ID are participating in similar amounts of PA, 60% are inactive in the older population verse 56% of adults with ID. These statistics prove the need for health promotion targeting physical activity for those aging with and without a disability.

Furthermore, as an individual with ID ages, lifestyle including PA plays a critical role for health and physical capacity later in life (Bigby, 2004). Research shows that older adults with mild to moderate ID have older age-related conditions comparable to the general population (Evenhuis et al., 2001). These conditions are exacerbated, in the community setting, when individuals with ID are offered more choices. Individuals with mild ID, when given the choice will often choose risky lifestyle behaviors and physical inactivity, often leading to negative health outcomes such as obesity, cardiovascular disease, diabetes, poor nutritional intake, sexually transmitted diseases, etc (Evenhuis et al., 2001; Frey, Buchman, & Sandt, 2005).

Obesity is a large health concern for those with ID due in part to their sedentary lifestyles. In the United States, 50% of adults with ID are overweight

compared to a third of the general population (Bigby, 2004; Janicki et al., 2002). Janicki et al. (2002) conducted a survey with 1,371 adults with ID, ages 40-79. The findings suggest lower rates of exercise and higher rates of dietary insufficiency. Over half of the participants in the study were classified as obese according to body mass index (BMI) (Janicki et al., 2002). According to Stanish and Draheim (2005a), 80% of adults with mild to moderate intellectual disability in the community setting are overweight or obese (including 45% obese and 8% severely obese). This is a concern due to the morbidity associated with being overweight and the risk factors related to cardiovascular disease (CVD) (Stanish & Draheim, 2005a). These studies also indicated that the prevalence of obesity increases with age (Draheim, 2006). Janicki et al. (2002) study showed a direct relationship with increasing age and the occurrences of cardiovascular, musculoskeletal, respiratory conditions, and sensory impairments.

The increase in sedentary behaviors in the aging population has raised concerns for overall health and well-being in later life. One of the biggest problems in today's society related to health is cardiovascular disease making it the leading cause of death in the United States. This is also the leading cause of death for those with ID. Physical activity can control some of the risk factors associated with CVD. These risk factors include elevated cholesterol, elevated LDL levels, low HDL levels, obesity, and diabetes. One possible explanation to the increase in the prevalence of CVD for those with ID is due to the increasing life expectancy of this population. Since CVD starts earlier in life and progress with age, individuals with ID are now living long enough to see effects of negative lifestyle behaviors (Draheim, 2006).

Health Promotion for Persons with Intellectual Disabilities. There is a scarcity of literature on health promotion (HP) for individuals with disabilities, which has left a gap in understanding how to improve health and reduce secondary conditions in this population. In *Healthy People 2000*, an expert panel observed the absence of health-related data for those with disabilities. Within the past decade, there has been a slow but steady increase in the importance of health promotion for those with disabilities (US Department of Health and Human Services, January 2000). Now, in the national public health initiative, *Healthy People 2010*, it mentions individuals with disabilities in 5 out of 15 sections in the guidelines and has included a section for the prevention of secondary conditions for individuals with disabilities (US Department of Health and Human Services, November 2000).

The current text, *Disability and Public Health* (2009), emphasizes a new perspective of disability that no longer views disability as a negative health outcome. The text separates and examines the conceptual ideas of decreased health and its associations with having a disability. The publication of *Disability and Public Health* has developed awareness in the field of public health to include those with disabilities in health promotion programs as a primary prevention of secondary conditions and other preventable health outcomes (Drum, Krahn, & Bersani, 2009a).

As a blue print for including and designing HP programs for those with disabilities, experts in the disability, public health, and other associated fields recently established guidelines for use by practitioners and researchers implementing HP programs. The following guidelines were determined for creating appropriate HP

programs for those with disabilities: 1) Include an underlying theoretical framework, 2) Implement process evaluation, 3) Use disability-appropriate outcome measures, 4) Include all stakeholders in the development and implementation of the program, 5) Consider the beliefs, practices, and values of the targeted group, 6) Make program socially, behaviorally, programmatically, and environmentally accessible to participants, and 7) Create an affordable program. to assist the implementation of HP interventions and programs for individuals with disabilities. These guidelines are strongly encouraged to use as the best available set of practices for implementing HP programs for those with disabilities (Drum et al., 2009b).

In a current evaluation of community-based health promotion programs specifically for those with ID, several themes emerged as effective ways to implement HP programs. One key component is having a "buy-in" from all program partners including those with ID, staff, family, agencies, and other stakeholders involved with the program. Discussions are needed to inform and educate all stakeholders involved in order to achieve the proper "buy-in." It is important to establish clear expectations of deadlines, assessments, and schedules to ensure accountability and support for the program. Another element of a successful HP program for those with ID is recruitment. The lay work prior to the onset of the program is critical. It is especially important to develop and foster existing relationships with those with ID, their staff, community agencies, and families. Other suggestions for effective HP programs for those with ID include keeping a low cost program, providing transportation or choosing an appropriate location for the program, acknowledging and addressing staff

turnover, keeping simple assessments, including motivational strategies, and incorporating a control group. As a result, the community-based HP program review authors determined the following five components as key points in the development of an effective HP program for those with ID: 1) theoretical support, 2) supportive environments, 3) educational focus, 4) core activities, and 5) evaluation (Marks, Sisirak, Heller, & Wagner, 2010).

Lastly, there is a lack of health promotion programs for those with ID. The deficit in HP efforts has significant concerns for three reasons. First, healthcare costs for inactivity of the general population estimates $75 billion in the United States. There is currently no data for the cost of inactivity for those with ID. Second, indirect costs of inactivity such as premature death, lost wages, and work limitations are estimated over $38 million and account for 76% of the total lifetime costs related to ID diagnoses. Portion of these costs are predicted to be from inactivity. The third reason is even though the emotional and social aspects are difficult to assess for inactivity, individuals with ID express desire for control of their lives. If inactivity is an indicator for health, then independence will be compromised with the lack of activity. Thus, affecting their ability to choose and control their lives (Stanish et al., 2006). Additionally, health promotion interventions targeted for older adults needs to be a priority as our nation moves into the “baby boomer” society. This is especially important, since health care costs are expected to rise drastically for older adults with and without ID, particularly for nursing care required for those with functional limitations (Resnick, 2002).

Social Cognitive Theory

There is a lack of theory-based health promotion research and interventions for individuals with disabilities (Peterson, Hammond, & Culley, 2009a). Drum et al., (2009b) article, *Health Promotion Guidelines for Individuals with Disabilities*, suggests health promotion programs for those with disabilities should have an underlying theoretical framework in order to combine knowledge of health promotion science, build on theory, and provide a way to assess program effects. According to Peterson et al., (2009a), the social cognitive theory (SCT) is a key theory of health behavior change for individuals with disabilities, and has been successfully used in HP programs involving individuals with ID, for example, the *Exercise and Nutrition Health Education Curriculum for Adults with Developmental Disabilities* (Heller, Marks, & Ailey, 2001). The curriculum helped participants a) develop positive outcome expectations through education about their benefits, b) increase their self-efficacy for exercise, and c) develop goals and preference-based plans for promotion of healthy behaviors (Heller et al., 2001).

The social cognitive theory by Bandura (1986) tries to combine the interactions of psychological and environmental factors to explain behavior. This theory provides reasonable explanations to why older adults are not utilizing physical activity to promote healthy aging. The first initial publications on the SCT by Bandura, (1986) shifted the view of human actions towards the idea of cognitive driven processes for

adapting and changing behavior. Through this theory, human behavior is based on reciprocal interactions between personal, environmental, and behavior factors. *Personal factors* in the form of cognition, affect, and biological events, *behavior* as the action to perform the task, and *environmental influences* created through interactions with others that influence aspirations to perform the behavior (Pajares, 2002). Moreover, the core components of the SCT and basis for this study are the interactions of personal factors in the form of self-efficacy (SE), perceptions of the social environment in the form of social support (SS), and its affect on physical activity behavior.

Based on the strength and influence of the factors involved, the effect of personal and environmental factors have a direct or indirect affect on the PA behavior. Personal factors within the SCT affecting on physical activity include demographic variables, but also include psychosocial variables such as self-efficacy, self regulation, and outcome expectations (Anderson, Wojcik, Winett, & Williams, 2006). Bandura (1986) further emphasizes one of these elements of personal factors through deriving an associated theory of self-efficacy, stating that outcome expectations are dependent on one's self-efficacy (Bandura, 1986; Resnick, 2002). Additionally, the environmental factor most associated with physical activity adherence involves the concept of social support. Environments and social systems influence behavior change, through psychological mechanisms increasing self-efficacy beliefs, personal standards, emotional states, and other self-regulatory influences (Pajares, 2002). Thus,

the influence of social support on PA behavior is often an indirect relationship through increasing self-efficacy to be active.

Personal Factor: Self- Efficacy. Although knowledge creates the precondition for behavior change, personal factors need to be conquered in order to adopt and maintain healthy lifestyle behaviors. Other health theories assume individuals have the knowledge to understand potential health risks. It is essential for individuals to first be aware of their lifestyle habits, and how it is affecting their health. However, it is not a productive practice to lecture about bad habits and health risks, especially when many individuals have no desire to go through the hard work of changing unhealthy behaviors they particularly enjoy. This is particularly true for those with ID. Individuals with ID enjoy the short term benefits of physical inactivity, and have difficulty understanding long term affects of their actions (Frey et al., 2005). Self-efficacy (SE) plays a critical role in the structure of the SCT, with personal efficacy being the major basis for action. Self-efficacy meaning unless an individual believes they can perform the action, they will have limited incentives to act or face setbacks associated with their pursued behavior (Bandura, 1998).

Self-efficacy is a core principle in the social cognitive theory. There are many different sources of self-efficacy. Bandura (1986) states that one's self-knowledge about their efficacy whether it is true or false, is based on four sources of information which are 1) performance attainments, 2) vicarious experiences, 3) verbal persuasion and social influence, and 4) psychological states. Performance attainments include an individual's mastery experiences in a particular area of interest. Positive experiences

in the past raise one's self-efficacy to perform the task again. Failure in performing a task lowers self-efficacy, especially if it is early in life and does not reflect a lack of effort. Vicarious experiences are viewed through observations of other individuals with similar capabilities succeeding in a specific task. Verbal persuasion and social influence is a source of self-efficacy given by others. This is feedback that is given to performers during the activity to encourage them to believe in their capabilities to perform a task. The last source of self- efficacy is physiological states or somatic indicators that allow an individual to evaluate their abilities to perform the task. These indicators include pain, fatigue, physical limitations, and fear or anxiety (Bandura, 1986).

Self-efficacy in relation to physical activity means one's belief they can perform physical activity even when faced with challenges. Self-efficacy stems from personal factors such as age, gender, health, and environmental factors which include safe facilities, transportation, and social support. Individuals with high self-efficacy for physical activity are shown to have increased benefits associated with physical activity including decreased stress, improve physical fitness, greater overall well-being, and avoidance of many health problems (Anderson et al., 2006).

Self-efficacy is shown to decrease with age. Age is a powerful factor in self-efficacy judgments because of its influences with self-evaluation and perceptions of self. Many barriers associated with physical activity engagement, especially for older adults, are altitudinal including the concept of self- efficacy (Lee et al., 2008). There are many misconceptions within the older population that physical activity may cause

activity restriction or it's irrelevant for their older age. Many older adults feel that aging is evitable and irreversible, making physical activity pointless in later life (Lee et al., 2008). In addition, both older and younger adults believe that older individuals should not participate in PA, due to the risk of injury (O'Neil & Reid 1991).

In a study by Booth, Bauman, Owen, and Gore (1997), among the general population aged 60 to 78 years, injury or poor health were the most frequently cited barriers to activity. However, another mentioned barrier by the older population was being too 'old' to be active or lack of self-efficacy to participate in PA (Booth, Bauman, Owen, & Gore, 1997). The concept of being "too old," was also identified in the O' Brien Cousins (2000) article, where older adults believed they were "too old" to exercise or felt they were not physically capable to perform physical activity. According to O'Brien Cousin (1998), psychological barriers are essential factors when looking at barriers for exercise in the older population. In addition, O' Neil and Reid (1991) describe four types of barriers that older adults need to overcome in order to participate in PA, one being psychological and the others including physical health, administrative concerns, and lack of PA knowledge. Potentially, all of the above barriers could be resolved with an appropriate health promotion program.

For those with intellectual disabilities, the idea of self-efficacy is a new concept. There are currently two other published studies that examined self-efficacy in adults with intellectual disabilities (Heller, et al., 2004; J. Peterson, Lowe, N. Peterson, Nothwehr, Janz, & Lobas, 2008b). J. Peterson, N. Peterson, Lowe, & Nothwehr (2009b) and Lee, Peterson, and Dixon (2010) were the first to validate self-efficacy

and social support scales for this population. Now with the validation of scales specific for those with ID, additional research is promising in this area.

There is a clear lack of studies specifically examining the effects of self-efficacy for older adults with intellectual disabilities. A study by Peterson et al., (2008b) provided some of the first empirical evidence for evaluating self-efficacy towards leisure-time physical activity for those with ID. The study results were consistent with other studies involving self-efficacy and physical activity. In both the younger and older sample in this study, self-efficacy was a significant factor associated with physical activity behavior with a correlation of 0.37 for the younger adult subgroup and a correlation of 0.32 in the older adult subgroup. In this population, self-efficacy worked as a mediating role between social support and physical activity behavior. Even though the relationship between social support and physical activity behavior was in part a direct relationship, it was also partly mediated by self-efficacy. This study shows that social support is a significant factor affecting an individual with ID's confidence to overcome barriers to participate in PA (J. Peterson et al., 2008).

Furthermore, Heller et al., (2004) conducted an exercise intervention that examined self-efficacy in adults with ID. The results from this intervention showed that at baseline half of the 53 adults with Down syndrome did not feel that they could increase their strength or flexibility. However, all those who participated in the exercise intervention increased their self-efficacy to perform exercise. This study was important to show that individuals with intellectual disabilities, at baseline, have lower levels of self-efficacy similar to other special populations, and they also have the potential to increase self-efficacy during and after interventions.

Qualitatively, Temple (2009) interviewed 13 active adults with intellectual disabilities to determine factors associated with physical activity participation. The results from a semi-structured interview showed that active adults with ID depend on social and environmental supports to "show them how" to be active and give them confidence. Their lack of personal skills was a barrier for PA, which explains perceived confidence as a strong indicator for PA participation. Additionally, role modeling was very important in their PA success. When factors in this article were compared to correlates for PA in the general population, many of the same influences were identified including self-efficacy and social support.

Environmental Factor: Social Support. Social support is an environmental variable that can affect physical activity behavior. Social support can be separated into four categories including 1) emotional, 2) instrumental, 3) informational, and 4) appraisal. Emotional support comes in the form of empathy, love, and trust. Instrumental support is the exchange of tangible services such as aids, money, or transportation. Informational support provides communication for the result of problem-solving. For example, teaching another individual how to perform a task. The last category is appraisal support which is the communication of information for self-evaluation, for example, receiving positive reinforcement or encouragement about their participation in an exercise program (House, 1981).

Duncan and McAuley's (1993) study provides further explanation on the role of social support for physical activity behavior. The following are key points expressed in this article: 1) Individuals examine their own capabilities from vicarious and symbolic sources of self-efficacy through their constant interactions with their

social environments. 2) The interactions from an individual's social network can facilitate successful coping behaviors through direct assistance, advice, and encouragement. 3) Coping endeavors developed through interactions with social supports can assist in the challenge of complying with an exercise or a physical activity program.

The influence of social support networks on health behavior has been examined from a multidimensional perspective. Robert Weiss (1974) proposed a theory of social relations that describes six social functions that can be gained from social relationships: 1) Attachment or emotional support, 2) Social integration or network support, 3) Reassurance of worth or esteem worth, 4) Reliable alliance or tangible aid, 5) Guidance or informational support, and 6) Opportunity for nurturance which is assisting others to increase own self-worth. Weiss (1974) notes that all six functions are needed for an individual to feel supported and to cope with stressful life situations. Coping has two major functions. The first function is to regulate emotion and the second function is to mange problems that cause stress. Furthermore, stressful situations perceived as controllable are generally followed by efforts to change the situation. Physical activity behaviors are under the individual's control, thus, the functions of social relations such as attachment, guidance, and social integration are appropriate to help an individual in their struggle to comply with physical activity regimens. Moreover, the idea of social relationships aiding in coping with the challenge of being physically active particularly plays an important role for at-risk populations (Duncan & McAuley, 1993).

In the older population, social support from family and friends is an important factor in the prediction of physical activity (King, 2001; Lee et al., 2008; Stahl et al., 2001). Older women typically depend more on social support than males. For both male and female, having a spouse or friend who is physically active is associated with physical activity participation (Booth et al., 2000; Plonczynski, Wilbur, Larson, & Thiede, 2008; Stahl et al., 2001). Anderson et al. (2006) study showed older participants, 54 years and older, had higher perceived social supports than younger participants. Nevertheless, even with large amounts of social supports a stronger barrier existed, decreased self-efficacy. The social support described in this study was not strong enough to exceed the negative thoughts associated with their perceived physical limitations and decreased confidence for PA. It is also noted that within the aging population, social support is shown to affect physical activity indirectly through self-efficacy, making social support a strong factor that could increase SE for PA (Anderson et al., 2006; McAuley et al., 2003; McNeil, Wyrwich, Brownson, Clark, & Kreuter, 2006).

The social environment plays a role in PA behavior for many with intellectual disabilities. Rimmer and Rowland, (2008) emphasize that environment can exacerbate secondary conditions through discouraging or preventing participation in health promoting activities. This is true of those with ID whose environments are often structured by their supports. Krahn et al., (2006) also describes that residential settings supporting inactivity and poor nutrition is a factor that contributes to the observed poor health of those with ID.

Individuals with intellectual disabilities receive the majority of their social support from three groups of individuals: Family, staff, and friends (Robertson et al., 2001). In the study by Robertson et al., (2001), when examining social networks of 500 adults with ID they determined that the younger participants had larger social networks. The younger adults with ID were also more likely to have a relative or a friend with ID in their network. The data in this study also emphasized an increased risk for social exclusion for older adults with ID, potentially from transitioning into group homes later in life or the loss of a guardian (e.g. parent) (Robertson et al., 2001).

In addition, a 1995 article suggests adults with ID did not have options to marry or have children. The perceptions of parents, staff, and special education teachers were unchanged in a 2002 article with most of these supports agreeing those with ID should not marry or bear children (Aunos & Feldman, 2002; Whmeyer & Metzler, 1995). Therefore, other family members, staff, and peers are their source of support due to the lower cases of marriage and primary family (children) in this population. This could potentially be leading to decreased physical activity in later life, as older adults without ID are shown to be more active with support from their spouse (Booth et al., 2000; Plonczynski, Wilbur, Larson, & Thiede, 2008; Stahl et al., 2001).

The older population with ID has a unique transition in social relationships. The closest social relationship for adults with ID is the family, because most individuals with ID did not marry or have children, only until recently. Therefore, as individuals with ID age and outlive their parents, siblings become the closest relatives

and staff then becomes the basis of their support system. The maintenance of previous friendships in this stage of their lives becomes difficult unless staff recognize these friendships and provide active support to allow continued contact (Bigby, 2004).

The change in social relationships as an individual with ID ages is critical when determining their basis of social support for physical activity. There is currently one study that empirically examined social support and physical activity for those with ID (Peterson et al., 2008b). The results from Peterson et al., (2008b) study display the transitions in social support for those aging with ID, with the strongest correlation between social support and PA for those 18-34 years being family, (r = 0.36), and the strongest correlation between social support and PA for those 35-60 years being staff, (r = 0.41).

Qualitative studies have been conducted to determine the influence of social support by examining staff and participants' perceptions about physical activity. Frey, Buchman, & Rosser Sandt, (2005) describes a lack of guidance for physical activity for those with ID. During the interview process of individuals with ID and their care staff, a salient barrier unique to this population became a recurrent theme, negative supports. There are caregivers, coaches, teachers, and role models reinforcing sedentary behaviors for reasons consisting of lack of knowledge about physical activity, fear for their safety, ignorance that this population can improve health, and lack of time to take individuals to active programs (Frey et al., 2005). The importance of support systems and authority figures is really powerful for individuals with ID, when promoting health and physical activity. In addition, individuals with ID do

perceive benefits to physical activity similar to the general population i.e., awards (scoring and winning), looking good, social interactions, and feeling good (Frey et al., 2005). However, regardless of confidence or benefits associated with PA, those with ID were restricted from participation because of "negative supports" (Frey et al., 2005).

Further evidence demonstrates the influence of social support on PA for those with disabilities; a study conducted determined staffs' perceptions of PA strongly influence the activity level of those with cerebral palsy (CP). The caregivers' perception about the benefits of exercise for the adult with a disability greatly influenced the degree in which the individual participated in exercise. For staff and caregivers that perceived more benefits from exercise, the person with CP was more likely to be active. Staff and caregivers that had poor health and lacked interest in PA were more likely to not provide support and guidance for exercise. These outcomes demonstrate that in order to increase physical activity behaviors for those with disabilities, staff and caregivers need to become educated about exercise, and provide proper support and guidance (Heller, Hsieh, & Rimmer, 2002).

In addition, interventions have also shown that with proper guidance those with ID can increase knowledge and participation in physical activity. For instance, Heller's (2004) program "*Exercise and Nutrition Health Education Curriculum for Adults with Developmental Disabilities*" and Mann, Zhou, McDermott, and Poston's (2006) program "*Steps to Your Health*" both explain how social support is an aspect needed to increase healthy behaviors. This is true, because just giving advice and

screening alone in these programs were not effective in reducing obesity (Marshall, McConkey, & Moore, 2003). Thus, the importance of education and PA behavior change should not only be targeted to the individual with ID, but also with their social supports. Determining ways to incorporate a health promotion program for both the individual with ID and their supports would be the optimal way to change PA behavior.

The social environment would also include the space in which an individual lives. Accordingly, researchers need to evaluate the affects of living arrangements on health behaviors. In the past 40 years, there has been a drastic shift in living arrangements in the United States for those with ID. Older adults with ID are more likely to live in shared supported living arrangements rather than homes with family or friends. In addition, the current aging population with ID is more likely to be relocated to aging care facilities at much younger ages than other residents (Bigby, 2004). This is partly due to past discrimination and efforts to "hide" those with ID from the community. It was common in the first half of the twentieth century to house individuals with ID in institutions away from visual sight of the public. Therefore, most older adults, 50 years and older, were influenced by the disability rights movement, which caused integration from secluded institutions into community settings (Ward, 2009).

As a result, researchers creating health promotion interventions need to be aware of this shift and the impact it has on the health status of those with ID. For instance, those living in institutional settings are shown to have better health-risk

profiles when compared to those living in a group home or family setting. In Rimmer, Braddock, and Marks, (1995) article, it was suggested that individuals in institutional setting are consistently watched, meals scheduled, and every day choices are planned leading to positive health risk profiles for these individuals. Adults with ID in least restrictive settings such as group homes and family homes have less supervision, more choices, and lack awareness of the their health behaviors (Rimmer et al., 1995). Therefore without proper supports, individuals living in residential setting or with family members are not choosing healthy lifestyles.

Conclusion

There are many health benefits for participating in physical activity; however, many older adults are inactive. In the decades to come, there will be an increase in the older population. By 2050, 80 million individuals will be 65 years or older, that is 1 in 5 Americans being in this aging category (Perkins et al., 2008). In order to increase life expectancy and decrease morbidity, physical activity needs to be a part of the aging population's lifestyle. This study will use the social cognitive theory to combine aspects of personal and environmental factors to explain why older adults are not utilizing physical activity to promote healthy aging.

It is essential not only to look at aspects related to aging in the general population, but to also examine personal and environmental factors associated with physical activity in the aging population with an intellectual disability. With limited research, this study is needed to empirically examine physical activity patterns of older adults with intellectual disabilities, and the effects of self-efficacy and social support

on physical activity behaviors. Furthermore, a study examining the psychological and environmental factors associated with physical activity behavior is helpful when determining how to implement health promotion interventions for adults aging with a disability.

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APPENDIX B

IRB APPROVAL

Institutional Review Board ● Office of Research Integrity
B308 Kerr Administration Building, Corvallis, Oregon 97331-2140
Tel 541-737-8008 | **Fax** 541-737-3093 | IRB@oregonstate.edu
February 24, 2010
http://oregonstate.edu/research/ori/humansubjects.htm

NOTIFICATION OF APPROVAL

Principal Investigator:	Miyoung Lee, PhD	Department:	Nutrition and Exercise Science (NES)
Study Team Members:			
Student Researcher:	Alicia Dixon		
Study Number:	4404		
Study Title:	Roles of Self-Efficacy and Social Support on Physical Activity Behavior in Older Adults with and without Intellectual Disabilities		
Funding Source:	Special Olympics International (CDC)		
Submission Type:	Project Revision received 01/07/10		
Review Category:	Expedited	Category Number:	7
Waiver(s):	None	Number of Participants:	210
Risk level for children[1]:	N/A		

The above referenced study was reviewed and approved by the OSU Institutional Review Board (IRB).

Approval Date: 02/23/2010
Expiration Date: 09/03/2010

Annual continuing review applications are due at least 30 days prior to expiration date

Documents included in IRB approval:

☒ Protocol
☒ Consent forms
☐ Assent forms
☒ Recruiting tools
☒ Test instruments
☐ Attachment A: Radiation materials
☐ External IRB approvals
☐ Translated documents
☐ Attachment B: Human
☒ Grant/contract
☒ Letters of support
☐ Other:

☒ Project revisions: Received funding from Special Olympics International which created the need to revise the protocol and all other documents noted above to account for the funding and more diverse participant population.

[1] Where parental permission is to be obtained, the IRB may find that the permission of one parent is sufficient for research to be conducted under §46.404 or §46.405. Where research is covered by §§46.406 and 46.407 and permission is to be obtained from parents, both parents must give their permission unless one parent is deceased, unknown, incompetent, or not reasonably available, or when only one parent has legal responsibility for the care and custody of the child.

Principal Investigator responsibilities for fulfilling the requirements of approval:

- All study team members should be kept informed of the status of the research.
- Any changes to the research must be submitted to the IRB for review and approval prior to the activation of the changes.
- Reports of unanticipated problems involving risks to participants or others must be submitted to the IRB within three calendar days.
- Only consent forms with a valid approval stamp may be presented to participants.
- Submit a continuing review application or final report to the IRB for review at least four weeks prior to the expiration date. Failure to submit a continuing review application prior to the expiration date will result in termination of the research, discontinuation of enrolled participants, and the submission of a new application to the IRB.

If you have any questions, please contact the IRB Office at IRB@oregonstate.edu or by phone at (541) 737-8008.

APPENDIX C

INFORMED CONSENT (WITHOUT ID)

Nutrition and Exercise Science
Oregon State University, 123 Women's Building, Corvallis, Oregon 97331
Tel 541-737-5927| http://search.oregonstate.edu/web/ movement+studies+in+disability

INFORMED CONSENT DOCUMENT

Project Title: **Roles of Self-Efficacy and Social Support on Physical Activity Behavior in Older Adults with and without Intellectual Disabilities**

Principal Investigator: **Dr. Miyoung Lee, Department of Nutrition and Exercise Science; Movement Studies in Disabilities**

Co-Investigator(s):**Alicia Dixon, Department of Nutrition and Exercise Science; Movement Studies in Disabilities**

WHAT IS THE PURPOSE OF THIS STUDY?

You are being invited to take part in a research study. A research study is a special way to find out about something. We are trying to find out about your physical activity and what factors affect your physical activity. These factors are your confidence for physical activity and your social support you may have for physical activity. The results and outcomes of this study will be used as a student thesis and publication.

We are conducting this study because we want to determine appropriate public health interventions for the aging population to increase physical activity. By examining both older adults with and without intellectual disabilities, we can discover physical activity habits of the older population. This is the first step to increasing health for older adults with and without disabilities.

WHAT IS THE PURPOSE OF THIS FORM?

This consent form gives you information, so you can decide whether to be in the study or not. Please read the form carefully. You may ask any questions about the study, the possible risks and benefits, your rights as a volunteer, and anything else that is not clear. When all of your questions have been answered, you can decide if you want to be in this study or not.

WHY AM I BEING INVITED TO TAKE PART IN THIS STUDY?

You are being invited to take part in this study because you are an adult over the age of 65 years, can walk independently without the use of a device, and interested in participating in a physical activity study.

WHAT WILL HAPPEN DURING THIS STUDY AND HOW LONG WILL IT TAKE?

If you decide to participate in this study you will be asked to wear a belt with two physical activity devices called an accelerometer and pedometer for seven consecutive days.

- The accelerometer measures the how much and how hard you perform physical activity.
- The pedometer will track how many steps you are taking.

At the initial meeting, at a location of your choice, we will give you the belt with the devices and instructions on how to wear it. We will also measure your weight, height, and waist and hip measurements during this time.

At the second meeting following the seven days of wearing the physical activity devices, you will meet with the student researcher and complete an interview process with questionnaires about your physical activity confidence, social support, physical activity, and health characteristics.

The initial meeting will be for approximately 30 minutes to give you the devices and explain the protocol. The second meeting will be between 30- 45 minutes for the questionnaires. The length of time between the initial visit and the second visit will be one week.

WHAT ARE THE RISKS OF THIS STUDY?

The possible risks and/or discomforts described in this study are very small. You will be asked to perform normal activities while wearing the physical activity devices. The questionnaire, height, weight, waist and hip measurements will be done in a private room. For the height, weight, and circumference measurements you will just need to wear loose fitting clothing. Your results will always be private throughout the process.

WHAT ARE THE BENEFITS OF THIS STUDY?

One possible benefit to participating in this study is to learn about your current physical activity habits!

In addition, we hope that in the future other people might benefit from this study. The results from this study may further influence new health interventions to successfully increase physical activity, health, and wellness for those aging with and without disabilities

WILL I BE PAID FOR PARTICIPATING?

You will get a $20.00 for completing the study. You will receive this after all information is collected. If you have proxy assisting you, they will also receive $10.00 for their help.

WHO WILL SEE THE INFORMATION I GIVE?

The information you provide during the research study will be kept private to the extent permitted by law. To help protect your confidentiality, we will use a coding system to identify you in the study. All forms used including the your questionnaires, your physical activity results, your weight, height, hip and waist measurements will use your identifiable code. The only form that will have your name and information will be this consent document. This document and other documents from the study will be locked in a filing cabinet only viewed by the study team.

The study team will take all necessary precautions to keep your identify private. However, with more than one researcher in the study team a breach of confidentiality may occur unintentionally. This means that your information has the potential to be seen by others accidentally.

If the results of this project are published your name will not be used.

DO I HAVE A CHOICE TO BE IN THE STUDY?

If you decide to take part in the study, it should be because you really want to participate. You will not lose any benefits or rights if you choose not to volunteer. You can stop at any time during the study and will still keep the benefits and rights you had before

volunteering. If you decide not to be in the study, your decision will have no effect on the services you receive.

You will not be treated differently if you decide to stop taking part in the study. Also on the questionnaires, you can skip any questions that you don't want to answer. If you choose to stop participating in the study before it ends, the study team may keep information collected about you and use the information in study reports.

If you have any questions about this research project, please contact: Alicia Dixon by email at dixona@onid.orst.edu or by phone (814) 934-0757. You may also contact Dr. Miyoung Lee by email at Miyoung.Lee@oregonstate.edu or by phone at (541) 737-4649**.**

If you have questions about your rights as a participant, please contact the Oregon State University Institutional Review Board (IRB) Human Protections Administrator, at (541) 737-4933 or by email at IRB@oregonstate.edu.

Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

Participant's Name (printed):
_____

_____ _____
(Signature of Participant) (Date)

Proxy Name (printed): _____

_____ _____
(Signature of Proxy) (Date)

APPENDIX D

INFORMED CONSENT (ID)

Nutrition and Exercise Science
Oregon State University, 123 Women's Building, Corvallis, Oregon 97331
Tel 541-737-5927| http://search.oregonstate.edu/web/ movement+studies+in+disability

INFORMED CONSENT DOCUMENT (ID)

Project Title: **Roles of Self-Efficacy and Social Support on Physical Activity Behavior in Older Adults with and without Intellectual Disabilities**

Principal Investigator: **Dr. Miyoung Lee, Department of Nutrition and Exercise Science; Movement Studies in Disabilities**

Co-Investigator(s):**Alicia Dixon, Department of Nutrition and Exercise Science; Movement Studies in Disabilities**

WHAT IS THE PURPOSE OF THIS STUDY?

You are being invited to take part in a research study. We are trying to find out about your physical activity and what factors affect your physical activity. These factors are your confidence for physical activity and how your friends, family, and staff support your physical activity.

We are doing this study because we want to gain knowledge about physical activity of those with intellectual disabilities. In the future, this could help others to be more active and healthier.

WHAT IS THE PURPOSE OF THIS FORM?

This form is about the study, so you can learn about it and decide if you want to be in the study or not. You may ask any questions about the study and this form. When all of your questions have been answered, you can decide if you want to be in this study or not.

WHY AM I BEING INVITED TO TAKE PART IN THIS STUDY?

I am over the age of 18 years . YES_____ NO_____

I have an intellectual disability. YES_____ NO_____

I am able to walk independently. YES_____ NO_____

WHAT WILL HAPPEN DURING THIS STUDY AND HOW LONG WILL IT TAKE?

If you decide that you want to be in this study, we will ask you to do several things.

1. Wear physical activity devices for one week
   - The devices are a pedometer to measure your walking steps and an accelerometer to measure how hard you're doing physical activity
2. Answer questions on a survey
   - You may ask your proxy for help during the survey
3. Check your weight, height, waist and hip measurements
   - Your proxy will be with you while the student researcher measures you
   - You will need to wear loose fitting clothing
4. Meet with the student researcher two times to complete these items
   - The first meeting will be 30 minutes to give you the devices and check your height, weight, waist and hip measurements.
   - The second meeting will be 30- 45 minutes to do the questionnaires.

WHAT ARE THE RISKS OF THIS STUDY?

The possible risks in this study are very small. You will perform your normal activities while wearing the physical activity devices. The questionnaire, height, weight, waist and hip measurements will be done in a private room with your proxy present.

WHAT ARE THE BENEFITS OF THIS STUDY?

One possible benefit to participating in this study is to learn about your current physical activity habits!

In addition, we hope that other people might benefit from this study in the future. The results from this study may help other people with intellectual disabilities be more active and healthier.

WILL I BE PAID FOR PARTICIPATING?

You will get a $20.00 for completing the study! Your proxy or person helping you will get a $10.00 for their help.

WHO WILL SEE THE INFORMATION I GIVE?

When we are done with the study, we will write a report about what we found. We won't use your name in the report. We will not put your name on any of the papers. The only paper that will have your name will be this consent form. We will lock this paper and your other papers from the study in a filing cabinet, where only the study team can see them.

The study team will be very careful not to let others see your information. However, with more than one researcher in the study team a breach of confidentiality may occur. This means that your information has potential to be seen by others by accident.

DO I HAVE A CHOICE TO BE IN THE STUDY?

You don't have to be in this study. It's up to you. If you say okay now, but you want to stop later, that's okay too. All you have to do is tell us. You will not be treated differently if you decide to stop being in the study.

WHAT IF I HAVE QUESTIONS?

If you have any questions about this research project, please contact: Alicia Dixon by email at dixona@onid.orst.edu or by phone (814) 934-0757. You may also contact Dr. Miyoung Lee by email at Miyoung.Lee@oregonstate.edu or by phone at (541) 737-4649**.**

If you have questions about your rights as a participant, please contact the Oregon State University Institutional Review Board (IRB) Human Protections Administrator, at (541) 737-4933 or by email at IRB@oregonstate.edu.

Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

If you want to be in this study, please sign your name.

I, _____, want to be in this research study.
(Print your name here)

_____ _____
(Sign your name here) (Date)

Proxy Name (printed): _____

_____ _____
(Signature of Proxy) (Date)

APPENDIX E

PARTICIPANT PROTOCOL PACKET

Roles of Self-Efficacy and Social Support on Physical Activity Behavior in Older Adults with and without Intellectual Disabilities

Participant's Guide to Study Protocol

Dear Participant,

As part of this study, I would like to measure your current physical activity levels. As you have read in the informed consent document, there are two meeting times for this study. In the first meeting, we will complete the questionnaires, measure your height, weight, and waist and hip circumferences, and distribute the physical activity devices. Then, we will meet again in seven days for the collection of the devices and to provide you with nominal compensation for your efforts.

This packet is intended to give you a brief description of the testing protocol and provide you with some directions and information.

If you have any questions please contact:

Alicia Dixon, Masters Student
dixona@onid.orst.edu
814-934-0757
Dr. Miyoung Lee, Assistant Professor
Miyoung.Lee@oregonstate.edu
541-737-4649

Movement Studies in Disability
College of Health and Human Sciences
Department of Nutrition and Exercise Sciences
Oregon State University

Physical Activity Devices- Accelerometer & Pedometer

Instructions for wearing:

1) You are asked to put the belt on after you get up in the morning and take it off right before you go to bed.
2) Please put the belt on your waistline and make sure that the two devices are facing front and vertical (up and down), one placed on each hip (see picture).

NOTES:

- We will practice putting on and taking off the devices during the first meeting.
- You do no need to push anything on the device, simply leave it attached to the elastic band.
- The belt should be taken off during any water activities and during sleeping hours.

Survey

The survey is intended for adults with and without intellectual disabilities. For those with intellectual disabilities, there may be some questions in the survey that may be difficult to understand, so it is asked that a parent, caregiver, or staff accompanies the participant to act as a proxy. The proxy must see the participant at least 8 hours a week and known the participant for at least three consecutive months.

The survey can be conducted in a location most convenient for the participant and will take approximately 30-45 minutes to complete.

There are four sections that will be addressed in the survey:

1) Demographics and health information
2) Physical activity levels and Readiness for physical activity
3) Self-efficacy for physical activity
4) Social Support for physical activity

The survey will be conducted by the primary researcher, Alicia Dixon. A break will be provided after the first two sections of the survey process, if needed. Breaks can also be accommodated throughout the survey.

APPENDIX F

QUESTIONAIRE PACKET

ID Number:_____ G / ID (staff only)

Physical Activity Stages of Change

- For each of the following questions, check yes or no.

- ***Physical Activity*** or exercise includes activities like: walking briskly to the store, jogging, bicycling, adult group fitness, swimming, or any other activity that is as difficult as these activities.

	Yes	No
1. I am currently physical active?		
2. In the next 6 months, I want to become more physical active?		

- For an activity to be ***REGULAR***, you must perform a total of 30 minutes or more of physical activity per day or at least 5 days a week.
- Example: You take three 10 minute walks a day will equal 30 minutes of physical activity.

	Yes	No
3. I currently do ***REGULAR*** physical activity?		
4. In the last 6 months, I have been doing ***REGULAR*** physical activity?		

Godin Leisure-Time Exercise Questionnaire

Instructions: Considering a **7-Day** period (this last week), how many times on average do you do the following kinds of exercise for more than **15 minutes** during your **free time**. Please write the appropriate number on each line.

		Times Per Week
A)	**STRENUOUS EXERCISE** (HEART BEATS RAPIDLY) i.e. running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling	_____
B)	**MODERATE EXERCISE** (NOT EXHAUSTING) i.e. fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing	_____
C)	**MILD EXERCISE** (MINIMAL EFFORT) i.e. yoga, archery, fishing from river band, bowling, horseshoes, golf, easy walking	_____

Self-Efficacy for Physical Activity

We are going to talk about doing the physical activities that you do. For this part, your answers can be no, maybe, or yes.

	No	Maybe	Yes
1. Do you think that you can set aside time for physical activities almost every day?			
2. Do you think that you can do physical activities even when you are very busy?			
3. Do you think that you can do physical activities even when you are feeling sad or depressed?			
4. Do you think that you can do physical activities even after a long, hard day at work?			
5. Do you think that you can do physical activities on days when you don't have much energy?			
6. Do you think you can do physical activities when you are feeling lazy?			

Social Support for Physical Activity

Now we are going to talk about other people around you and the physical activities that you do. For this part, your answers can be no, sometimes, or a lot.

Family

First, I'm going to ask about your family. Remember, the choices are NO, SOMETIMES, or A LOT.

Does anyone in ***your family or significant others***…	**No, never**	**Yes, sometimes**	**Yes, a lot**
1. Remind you to do physical activities?			
2. Do physical activities with you?			
3. Plan physical activities when you spend time with them?			
4. Show you how to do physical activities?			
5. Tell you that you are good at physical activities?			
6. Pay for you to do physical activities somewhere or buy you things that you need to do physical activities?			
7. Drive you somewhere to do physical activities when you need them to?			

Staff

Now, I'm going to ask about your staff. Remember, the choices are NO, SOMETIMES, or A LOT.

Does anyone in ***your staff***…	**No, never**	**Yes, sometimes**	**Yes, a lot**
1. Remind you to do physical activities?			
2. Do physical activities with you?			
3. Plan physical activities when you spend time with them?			
4. Show you how to do physical activities?			
5. Tell you that you are good at physical activities?			
6. Drive you somewhere to do physical activities when you need them to?			

Friends

Now, I'm going to ask about your friends. Remember, the choices are NO, SOMETIMES, or A LOT.

Does anyone in ***your roommates or friends*** …	**No, never**	**Yes, sometimes**	**Yes, a lot**
1. Remind you to do physical activities?			
2. Do physical activities with you?			
3. Ask you to do physical activities with them, or is it ever their idea?			
4. Show you how to do physical activities?			
5. Tell you that you are good at physical activities?			

Demographic Information

Secondary Source (proxy) Information:

Age:_____ Gender:_____

What is your relationship to the participant (i.e. family member, legal guardian, group home staff)?	
Does the participant live with you?	
How much time do you spend with the participant?	hours per week _____ hours per day _____

Participant Information:

Age:		**Gender**:	
Height (inches):		**Weight** (lbs):	
Waist (cm):		**Hip Circumference** (cm):	
IQ (Provided by caregiver):			

How would you classify yourself?

_____ Arab
_____ Asian/Pacific Islander
_____ Black
_____ Caucasian/White
_____ Would rather not say
_____ Indigenous /Aboriginal
_____ Latino
_____ Multiracial
_____ Hispanic
Other:_____

What is your current marital status?

_____ Divorced
_____ Separated
_____ Living with another
_____ Single
_____ Married
_____ Widowed
_____ Would rather not say

What is the highest level of education you have completed?

_____Grammar school
_____Bachelor's degree
_____High school or equivalent
_____ Master's degree
_____ Vocational/technical school
_____Doctoral degree
_____ Some college
Other:_____

Which of the following categories best describes your area of employment?

_____ Homemaker
_____ Information - Other
_____ Retired
_____ Arts/ Entertainment
_____ Student
_____ Finance/ Insurance
_____ Unemployed
_____ Construction
_____ Agriculture
_____ Mining
_____ Broadcasting
_____ Utilities
_____ Education/ University
_____ Software
_____ Education - Other
_____ Processing
_____ Legal Services
_____ Military
_____ Manufacturing - Other
_____ Publishing

_____ Religious _____ Retail

_____ Hotel/ Food Services _____ Wholesale

_____ Scientific or Technical Services

_____ Telecommunications

_____ Government and Public Administration

_____ Education - Primary/Secondary (K-12)

_____ Real Estate, Rental, or Leasing

_____ Information - Services and Data

_____ Manufacturing: Computer/Electronics

_____ Health Care and Social Assistance

_____ Transportation and Warehousing

Other: _____

What is your current household income?

_____ Under $10,000 _____ $40,000 - $49,999

_____ $10,000 - $19,999 _____ $50,000 - $74,999

_____ $20,000 - $29,999 _____ $75,000 - $99,999

_____ $30,000 - $39,999 _____ $100,000 - $150,000

_____ Would rather not say _____ Over $150,000

What is your current living arrangement?

_____ Independent _____ Community dwelling (independent)

_____ Semi-independent _____Community dwelling (w/ assistance)

_____ Group home _____Retirement Community

_____ Institutional Setting _____Assisted Living

_____ Home w/family member _____ Nursing Home

With whom do you live?

____ Own family (spouse and/or children)

____ Roommates

____ Alone

____ Parents

____ Other (Please specify):_____

How do you rate your health?

_____ Excellent

_____ Good

_____ Average

_____ Fair

_____ Poor

Do you smoke? Circle yes or no

If yes, how many cigarettes a day?_____

weekly:_____

Do you drink alcohol? Circle yes or no

If yes, how many drinks do you have daily? _____ weekly: _____

Health History

Have you previously had: (Check all that Apply)

___ a heart attack

___ heart surgery

___ cardiac catheterization

___ coronary angioplasty (PTCA)

___ pacemaker/implantable cardiac defibrillator/rhythm disturbance

___ heart valve disease

___ heart failure

___ heart transplantation

___ congenital heart disease

Additional Health Questions: (Check all that Apply)

___ Do you take heart medications?

___ Are you diabetic or take medicine to control your blood sugar?

___ Do you have musculoskeletal problems?

___ Is your blood pressure is greater than 140/90?

___ Is your blood cholesterol level is >240 mg/dL?

___ Do you have a close blood relative who had a heart attack before age 55 (father or brother) or age 65 (mother or sister)?

Is there any other health concerns not mentioned that could affect your physical activity level?

If so please specify:

_____

APPENDIX G

APPARATUSES

Anthropometric Apparatuses

Health-O-Meter 500KL

Professional Fitness Scale

QM2000 Measure Mate

Physical Activity Apparatuses

Omron HJ 720ITC Pedometer

GT1M Actigraph Accelerometer