


A Study of Leisure Walking Intensity Levels on Mental Health and Health Perception of Older Adults

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Abstract

Research suggests that different levels of intensity of leisure walking can affect the mental health of older adults. Unfortunately, insufficient evidence exists as to the recommended intensity levels of leisure walking for their health benefits. The purpose of this study was to investigate how leisure walking intensity levels are associated with the mental health and health perceptions of older adults. Using a purposive sampling method, the data of 4,737 adults over the age of 65 were drawn from the 2017 California Health and Interview Survey. The results of analysis of these data showed that older adults who engaged in moderate and vigorous leisure walking reported higher health perceptions than those involved in light leisure walking. In addition, older adults who participated in moderate leisure walking reported higher mental health than those who engaged in light leisure walking. This study suggests that moderate and/or vigorous leisure walking can increase the mental health and health perceptions of older adults.

Keywords

leisure walking, mental health, health perception, older adults

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Introduction

The number of adults aged 65 years and older has been rapidly increasing worldwide. According to the Administration for Community Living (ACL, 2018), this population in the United States reached 49.2 million in 2016 and is projected to be 98 million in 2040. With such growth of the aging population, geriatric health promotion and health protection have become critical issues for health care professionals. Prior research has demonstrated that older adults are likely to experience a variety of health problems associated with chronic diseases, such as diabetes, cancer, heart disease, hypertension, and stroke (Elsawy & Higgins, 2010). In addition, older adults report high levels of cognitive challenges and impairments such as gradual memory loss, dementia including Alzheimer's disease, and a lack of attention skills (Schubert et al., 2017). Such health problems may lead to psychological problems and concerns, such as loneliness, social isolation, depression, and anxiety, which result in diminished mental health (Holt-Lunstad et al., 2015; Potvin et al., 2011).

Substantial evidence exists to show that insufficient physical activity is associated with social isolation and psychological distress among older adults (Ball et al.,

2007; Mortazavi et al., 2012). For instance, Mortazavi et al. (2012) demonstrated that older adults who did not participate in physical activity reported that they experienced higher levels of psychological problems than those adults who regularly participated in physical activity. In addition, research has shown that older adults who only pursue sedentary activities are more likely to experience an increased risk of chronic diseases than older adults who are physically active (Booth et al., 2011).

A growing body of literature has stressed the importance of physical activity to the physical and mental health of older adults (e. g., Pollard & Wagnild, 2017; Shigematsu et al., 2009). Among the various physical

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activities that have been studied, leisure walking is considered the most cost-effective therapeutic form of exercise as it does not require specific training or skills (WHO, 2017). Prior studies have associated leisure walking with increased physical activity participation (Kassavou et al., 2013), reduced mortality and cardiovascular disease rates (Manson et al., 2002; Patel et al., 2018), amelioration of depressive symptoms (Krogh et al., 2011), and preservation of cognitive health (Prohaska et al., 2009) among older adults. With regard to intensity, Julien et al. (2015) found that moderate or high levels of walking were associated with lower depressive symptoms and suggested that the amount of walking influenced mental health.

Other researchers also found that walking, as a moderate intensity activity, improved older adults' mental health and significantly reduced the severity of their pain severity as well as their levels of stress, and anxiety (Pereira et al., 2008; Shigematsu et al., 2009). In addition, Pollard and Wagnild (2017) suggested that older adults who regularly participated in low impact activities, such as slow dancing and leisure walking, reported improved psychological well-being and reduced depression. Thus, while multiple studies suggest that a fair amount of physical activity such as walking contributes to health benefits for older adults, some studies suggest that higher amounts of walking can be detrimental to some older adults. Therefore, more research is needed to determine an effective amount of walking in improving health-related quality of life. Accordingly, the aim of this study was to provide insight into how different levels of leisure walking intensity are associated with psychological health benefits for older adults. Toward this end, we compared measures of mental health and health perception among three groups of older adults who engaged in different intensity levels of leisure walking (i.e., light, moderate, and vigorous walking).

Havighurst's (1961) activity theory of aging proposes that older adults who are involved with activities and maintain an active lifestyle tend to experience wellbeing and life satisfaction. Previous studies have demonstrated a positive relationship between frequency of older adults' participation in activities and health benefits of (Lawton et al., 1999; Scarmeas et al., 2001; Wilson et al., 2002). Also, older adults' active engagement in physical activity and attention to physical fitness have been associated with a lower mortality risk and better health outcomes including longevity (Feldman et al., 2015; Stessman et al., 2009). These studies suggest that active participation in activities contributes to successful aging.

Menec (2003) conducted a 6-year longitudinal study to investigate the relationship between daily activity participation and successful aging from the perspective of activity theory and found that a greater overall activity level was associated with greater happiness, better functional abilities, and lower mortality. On the other

hand, using conjoint analysis, De Guzman et al. (2015) examined the physical activity preferences of community-dwelling elderly Filipinos and found that they preferred mild physical activity due gradual age-related decline of physical functions. They recommended light physical activity as most beneficial for older adults to increase health benefits. Such mixed results suggest the need for further research.

Along with the benefits of physical activity, leisure scholars stress the importance of social activities for the health of older adults (Gardiner et al., 2018; Jorgensen et al., 2017; Paggi et al., 2016; Turcotte et al., 2018). For example, Chen and Kao (2011) found that increasing older Taiwanese adults' positive social interactions and expanding their social networks helped reduce their negative psychological symptoms (e.g., depression and isolation) and improve their mental health.

As noted, leisure walking is one of the most cost-effective and accessible forms of physical activity in which older adults participate. The literature on physical activity provides evidence that older adults' participation in leisure walking leads to substantial physical, cognitive, and psychological benefits. Regarding the relationship between leisure walking and physical health, prior studies have found that leisure walking is associated with a reduced risk of cardiovascular disease and mortality (Manson et al., 2002; Patel et al., 2018). In terms of cognitive benefits, Maki et al. (2012) demonstrated that walking helps to improve memory, which in turn improves affective responses to others, positive attitudes, and quality of life. In addition, conversely, Prohaska et al. (2009) found that older adults with high levels of cognitive impairment reported a lower frequency of walking in the neighborhood, which suggests that leisure walking is positively associated with cognitive health among older adults.

Researchers and practitioners have considered thus leisure walking to be a therapeutic tool for promoting the overall health and well-being of older adults and can be effective in promoting physical activity participation among older adults who pursue sedentary leisure (Kassavou et al., 2013; WHO, 2017). As discussed, multiple studies have suggested that leisure walking plays an essential role in ameliorating depressive symptoms and negative thoughts (Krogh et al., 2011; Wensley & Slade, 2012) and reducing mood disorders, which contributes to the psychological well-being of the older adult participants.

Prior studies have also provided evidence that leisure walking in groups generates social cohesion, reduces perceived stress, and increases mental well-being (Doughty, 2013; Marselle et al., 2013). Hanson and Jones (2015) conducted a meta-analysis investigating the effects of walking groups on measures of BMI, physical, and mental health and found that among many health benefits, walking helped older adults improve their levels of adherence to health regimes and reduced their risk of serious adverse effects. Thus, these studies

Table 1. Demographic Characteristics Information (N = 4,737).

	n	%
Gender		
Male	1,936	40.9
Female	2,801	59.1
Marital status		
Married	2,278	48.1
Living with partner	119	2.5
Widowed	1,191	25.1
Divorced/Separated	851	18.0
Never married	298	6.3
Education level		
No formal education or grade 1–8	178	3.8
Grade 9–11	100	2.1
High school diploma	695	14.7
Some college	897	18.9
Vocational school	117	2.5
AA or AS degree	348	7.3
BA or BS degree/Some graduate school	1,270	26.8
MA or MS degree	668	14.1
PhD or equivalent	464	9.8

indicated that older adults gained physical, emotional, and mental well-being through leisure walking.

Christian et al. (2018) assessed the importance of leisure walking on participants' health perception and found that older adults perceived taking leisurely walks with their dogs as essential, and that the activity promoted healthy social and environmental interactions and helped to improve their psychological well-being. Their study emphasized that strong emotional links between older adults and their dogs strengthened the owners' motivation to exercise by walking their dogs.

Methods

Participants and Procedures

In this study secondary data analysis was conducted on data released from the 2017 California Health and Interview Survey (CHIS, 2017), which is a nationally representative survey of non-institutionalized adults in the United States. Using a purposive sampling method, the data of 4,737 adults over the age of 65 with the capacity to engage in leisure walking (Yang et al., 2017) were drawn from the survey results. The CHIS data includes a wide range of health information, such as health status, health behaviors, and health care utilization. The variables selected from the CHIS data for this study were leisure walking, general health, and mental health.

The participants' demographic characteristics, such as gender, marital status, and education level, are presented in Table 1. The analysis, as presented in this section, is based on the information provided by the participants at the time of the data collection as obtained from CHIS (2017). The 4,737 participants comprised 2,801 (59.1%)

females and 1,936 (40.9%) males. About 51% were either married or living with a partner, while 43% were widowed, divorced, or separated. Only 6.3% mentioned that they had never been married. Half of the participants had at least a bachelor's degree, while another 29% had attended some college or a vocational school or had an associate degree. About 15% had a high school diploma certificate, 2% had a 9th to 11th grade education, and the rest had lower or no formal education.

Variables and Instruments

Dependent variables. Health perception as a dependent variable was measured using the following question: "Would you say that, in general, your health is excellent, very good, good, fair, or poor?" This item was reverse coded and rated on a 5-point Likert type scale ranging from 5 (poor) to 1 (excellent). This measurement has been widely applied to health studies (Kim et al., 2016; Lee et al., 2019).

In order to measure the participants' mental health, six measuring mental health items from the K6 Mental Health Assessment, which was used in collecting the CHIS data, was utilized in this study. These items focused on how the participant felt in the last 30 days. The questions were as follows: "How often during the past 30 days did you feel nervous?" "How often during the past 30 days did you feel hopeless?" "How often during the past 30 days did you feel restless or fidgety?" "How often during the past 30 days did you feel so depressed that nothing could cheer you up?" "How often during the past 30 days did you feel everything was an effort?," and "How often during the past 30 days did you feel worthless?" The questions were rated on a 5-point Likert type scale ranging from 5 (none of the time/never) to 1 (all of the time).

Independent variables. Leisure walking was evaluated based on the duration and time a week that individuals engaged in leisure walking. In order to measure the intensity levels of the leisure walking, two questions were asked: "How many times did you walk for at least 10 minutes for fun, relaxation, exercise, or to walk the dog?" and "How long did your walk take/On average, how long did those walks take?" The answers were open-ended responses. As such, the continuous scores for leisure walking were calculated with the following formula: The Metabolic Equivalent of Task (MET) levels \times minutes (or hours) of activity per day \times days per week. MET is the objective measure of the ratio of the rate at which a person expends energy, relative to the mass of that person, while performing a specific physical activity compared to a reference set by convention at 3.5 ml of oxygen per kilogram per minute, which is roughly equivalent to the energy expended when sitting quietly. The individual's MET intensity levels help him/her understand which levels of physical activity are

Table 2. Descriptive Statistics on Health Perception and Mental Health.

Levels of leisure walking	Health perception	Mental health
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Light walking	3.50 (1.05)	4.58 (0.50)
Moderate walking	3.73 (1.02)	4.65 (0.43)
Vigorous walking	3.78 (1.01)	4.62 (0.48)

needed to burn calories and determine the most effective activities for meeting particular goals. The participants were then categorized into three leisure walking groups according to intensity levels (Ainsworth et al., 1993, 2000): (1) light walking group (individuals who reported 2.9 or fewer MET-hours/week), (2) moderate walking group (individuals who reported 3.0-5.9 MET-hours/week), and (3) vigorous walking group (those individuals who reported 6.0 or more MET-hours/week).

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive analysis was used to identify demographic and study construct characteristics. To test the significance of group differences a one-way multivariate analysis of variance (MANOVA) was conducted with the intensity of leisure walking as the independent variable and health perception and mental health as the dependent variables. The use of MANOVA is appropriate when the dependent variables are correlated and two correlations met the criterion (French et al., 2008): general health and mental health ($r = .327$, $p < .01$). A Dunnett T3 post-hoc test was conducted to measure the differences among the groups.

Results

Table 2 presents the mean scores and standard deviation of health perception and mental health according to the three intensity walking levels. The participants who engaged in vigorous walking reported the highest mean scores for health perception (mean = 3.78, $SD = 1.01$), and those who engaged in moderate walking reported the highest mean score for mental health (mean = 4.65, $SD = 0.43$), while participants who engaged in light walking reported the lowest mean scores for health perception (mean = 3.50, $SD = 1.05$) and mental health (mean = 4.58, $SD = 0.50$).

To test for the effect of the intensity of the leisure walking differences on health perception and mental health, the MANOVA analysis was conducted. Prior to the test, the homogeneity of the covariance using Box's M test was examined. A statistical test for equality of covariance matrices was found to be significant (Box's $M = 53.008$, $F = 8.825$, $p < .001$). Therefore, a more conservative Pillai's Trace test was used instead of Wilks'

lambda for determining statistical robustness (Tabachnick & Fidell, 2001). The MANOVA results showed that there are statistically significant differences in the dependent variables (i.e., health perception and mental health), Pillai Trace = .013, $F = 15.872$, $p = .000$, multivariate $\eta^2 = .007$ (see Table 3).

The univariate tests (Table 4) showed a statistically significant difference in health perception among the three different intensity levels of leisure walking groups ($F = 29.63$, $\eta^2 = .012$, $p < .001$). This indicates that older adults who participated in vigorous and moderate intensity levels of leisure walking reported better perceived health than those who participated in light intensity walking. The univariate tests also revealed a statistically significant difference in mental health between groups engaging in two different intensity levels of leisure walking ($F = 7.84$, $\eta^2 = .003$, $p < .001$). That is, older adults who participated in moderate intensity levels of leisure walking reported better mental health than those who participated in light intensity levels of leisure walking. A Dunnett T3 post-hoc test (Table 4) indicated that mean scores on health perception were significantly lower for the light walking group than for either the moderate walking or the vigorous walking groups, while no significant difference was found between moderate walking and vigorous walking groups. With regard to mental health, the Dunnett T3 post-hoc test showed that moderate walking participants had significantly higher scores than those in the light walking group (Table 4).

Discussion

This study was an exploration of the associations of different levels of leisure walking with the mental health and health perceptions of older adults. The results indicated that a higher level of leisure walking led to better health perception and mental health. This study therefore suggests that older adults are more likely to gain psychological health benefits through participation in moderate and/or vigorous leisure walking than light leisure walking, and that these intensity levels of leisure walking can be used as an effective tool for promoting the health and well-being of older adults.

Prior studies have suggested that leisure walking reduces depressive symptoms and increases positive feelings and emotions among older adults (Krogh et al., 2011; Wensley & Slade, 2012). Noh et al. (2015) showed that, by stimulating the central nervous system, leisure walking is effective for reducing stress, decreasing depressive symptoms, and improving performance in individuals of all ages and genders. The results of the current study suggest that such positive outcomes can contribute to improving the mental health and health perception of older adults. Thus, this study is in line with the current knowledge that a positive relationship exists between leisure walking and mental health.

Table 3. Multivariate Tests for Health Perception and Mental Health by Intensity Levels of Leisure Walking.

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial η^2
Intercept	Pillai's Trace	.981	121,876.740	2.000	4,733.000	.000***	.981
Leisure walking	Pillai's Trace	.013	15.872	4.000	9,468.000	.000***	.007

*** $p < .001$.

Table 4. Significant Univariate Effects and Post-Hoc Test for Levels of Leisure Walking.

Dependent value	Sum of squares	df	MS	F	p	Partial η^2	Observed power	Dunnett T3
Health perception	63.677	2	31.838	29.629***	.000	.012	1.000	2, 3 > 1
Mental health	3.706	2	1.853	7.838***	.000	.003	.953	2 > 1

Note. 1 = Light walking (less than 3.0 METs), 2 = Moderate walking (3.0–5.9 METs), and 3 = Vigorous walking (more than 6.0 METs).

*** $p < .001$.

Numerous clinical studies of the relationship between different intensities of physical activities and mental health have found that vigorous physical activity was most effective for increasing mental health (Asztalos et al., 2010; Cox & Whaley, 2004; Craft, 1997). On the other hand, some studies have demonstrated that moderate to light intensity physical activity is most beneficial for promoting psychological well-being and enhancing positive mood (Berger & Motl, 2000; Ford et al., 1991). These previous studies have indicated that a complex relationship exists between different levels of physical activity and mental health benefits. The current study indicates that moderate intensity of leisure walking is most beneficial for mental health among older adults, suggesting that vigorous leisure walking is not an ideal exercise form for promoting the mental health among older adults. In addition, the finding of this study that moderate walking can be effective in reducing older adults' depressive symptoms, partially support Julien et al.'s (2015) study showing that moderate or high levels of walking were associated with lower depressive symptoms.

Previous studies have stressed the importance of high levels of physical activity participation for health perception and health-related quality of life (Amireault et al., 2013; Ergun et al., 2013). The results of the current study support the idea that increased leisure walking participation helps older adults improve their health perceptions. This study also indicates that moderate leisure walking may be the optimal level of engagement for increasing the health perceptions of older adults. In addition, the descriptive statistics showed that older adults who reported high health perceptions tended to participate in more vigorous leisure walking, which suggests that one's self-perception of health can be an important motivational factor in regard to physical activity participation, such as leisure walking.

Some limitations in the present study need to be addressed. First, a cross-sectional and self-reported design was employed. An inverse relationship between leisure walking and health benefits may exist; that is,

older adults who perceive better health and well-being may participate in leisure walking more frequently. Future research is needed to explore this inverse relationship and may produce useful information on mutual effects of mental health and health perceptions and participation in physical activity. Second, other important variables that may affect leisure walking, such as social and physical environments (e.g., urban vs. rural), leisure preferences, and community-based programs were not explored in this study. Older adults who experience positive neighborhood bonding and utilize leisure resources may participate in more leisure-time physical activities. Future researchers might consider these factors when investigating physical activity participation. Third, other socio-demographic characteristics that may affect older adults' participation in leisure walking, such as education and socio-economic status, were not addressed and might be explored in further research. Finally, in this study previous medical conditions and histories that may affect leisure walking were not taken into account. Different types of disabilities or disorders should be considered in future studies.

Conclusion

Some implications may be drawn from this study as to how activity professionals and recreational therapists could design and implement leisure walking as an intervention for older adults. Substantial evidence exists to show that insufficient physical activity is associated with psychological problems among older adults such as social isolation, loneliness, depression, stress, and anxiety (Ball et al., 2007; Mortazavi et al., 2012). Activity professionals and recreational therapists need to create strategic plans for ways motivate and encourage older adults to engage in moderate levels of leisure walking. One method would be to create a walking buddy program. Providing the social dimension of participating in leisure walking with peers, could significantly increase older adults' motivation to engage in leisure walking.

In this regard, activity professionals and recreational therapists need to create community-based walking programs and activities for older adults by inviting friends and family members to serve as a social support system. Such community-based walking programs can encourage older adults who tend to pursue only sedentary leisure activities to participate in leisure walking. Activity professionals and recreational therapists might also design programs to encourage older adults currently pursuing moderate leisure walking to increase their levels of intensity to vigorous leisure walking, which might result in improved health perception.

Another implication is that leisure education programs that explain the importance of leisure walking and provide information about leisure resources might be implemented, especially for older adults who pursue only Knowledge of the benefits of leisure walking and resources available for participating might motivate these older adults to seek out leisure walking partners.

In addition, intergenerational walking programs would be effective programs that older adults could be encouraged to participate in. By interacting with a younger generation through leisure walking, older adults can share their experiences and create unique bonds.

This study was an initial exploration of the differences in mental health and health perception among older adults participating in different levels of leisure walking. The results of this study show that moderate and vigorous levels of walking intensity can lead to stronger mental health and health perceptions among older adults. Such positive health outcomes can contribute to successful aging. Further, leisure walking may be utilized as a strategy for preventing mental health issues among older adults. Therefore, activity professionals and recreational therapists should strive to provide richer opportunities for older adults to engage in leisure walking.

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