Archives of Gerontology and Geriatrics 73 (2017) 120–124

Contents lists available at ScienceDirect

Archives of Gerontology and Geriatrics

journal homepage: www.elsevier.com/locate/archger

The relationship between physical activity, meaning in life, and subjective vitality in community-dwelling older adults

Haewon Ju

Department of Psychology, Chung-Ang University, 84, Heukseok-ro, Dongjak-gu, Seoul, Republic of Korea

ARTICLE INFO

Keywords:
Meaning in life
Physical activity
Vitality
Fatigue
Older adults

ABSTRACT

The present study examined the potential contribution of meaning in life to the relationship between physical activity and subjective vitality in older adults. Two-hundred and fifty community-dwelling elders completed the instruments assessing physical activity, meaning in life, and subjective vitality. Results from structural equation modeling indicated that physical activity was positively associated with both meaning in life and subjective vitality. Further, the relationship between physical activity and vitality was partially mediated by meaning in life. Although previous studies have consistently found a positive impact of physical activity on vitality, the current study suggested that it is more productive to focus not only on physical activity, but also on meaning in life, in order to vitalize elders. Further, a focus on meaning in life can be a productive way to continue to vitalize older adults who are unable to engage in regular physical activity.

1. Introduction

There has been a growing interest in finding early signs of aging-related declines and subsequently developing preventive interventions aimed at slowing the aging process (Avlund, 2010). Increased fatigue or loss of vitality, which has been shown to be a common complaint among older adults, is known as a strong indicator of aging-related decline (Avlund, 2010; Eldadah, 2010; Karagozoglu, Arikan, & Eraydin, 2012; Liao & Ferrell, 2000). Fatigue is defined as "a subjective lack of energy," and also used interchangeably with tiredness, exhaustion, decreased vitality, and loss of energy (Avlund, 2010; Eldadah, 2010; MS Council for Clinical Practice Guidelines, 1998). Subjective vitality is defined as a feeling of energy and aliveness, and represents an inner force facilitating mental and somatic health (Ryan & Frederick, 1997).

Previous research has examined whether the experience of subjective vitality or fatigue could be an early indicator of aging-related decline. According to Avlund (2010), low vitality predicts functional declines, disability, and mortality from young-old age to old–old age and across gender and regions. Moreover, fatigue in 40-year old women was shown to be associated with early menopause (Nilsson, Möller, Köster, & Hollnagel, 1997). Another longitudinal study on the aging process showed that tiredness relating to one or more of 6 daily activities predicted nearly twice the risk of hospitalization and need for home care (Avlund, Damsgaard, & Schroll, 2001), and that a low-morale cohort was at an increased risk of death in old populations (Benito-León et al., 2010).

Considerable evidence indicates that physical activity could contribute towards enhanced vitality. Subjective vitality was higher in the high physical-activity group of university students than in the low physical-activity group (Molina-García, Castillo, & Queralt, 2011). This relationship was in line with that in investigations in which older adults participated, wherein physical activity was positively related to subjective vitality in community-dwelling elders (Olsson, Hurtig-Wennlöf, & Nilsson, 2014), but negatively related to fatigue among older adults staying in rest homes (Soyuer & Şenol, 2011). Ryan et al. (2010) reported an interesting result, showing that even imaginary physical activity had a positive effect on subjective vitality. People reported higher vitality when reading "physically active" vignettes, compared to "sedentary" ones.

Similarly, there is a positive relationship between meaning in life and subjective vitality. The concept of meaning in life is defined as two components, namely, seeking meaning in life and feeling meaning in life (Steger, Frazier, Oishi, & Kaler, 2006). A sense of meaning in life can give one zest for life and vigor, whereas lack of it can result in psychological distress, such as depression, with the most extreme sense of meaninglessness being suicide (Frankl, 2006; Hooker & Masters, 2016; Takkinen et al., 2001). Meaning in life was found to be positively linked to subjective vitality and self-rated health in adults and older adults (McMahan & Renken, 2011; Reker, Peacock, & Wong, 1987), but negatively related to burnout in firefighters and fatigue in cancer survivors (Krok, 2016; Thompson, 2007).

Various sources in one's life could contribute to perceptions that life is meaningful (De Vogler, & Ebersole, 1981; Pan, Wong, Chan, & Joubert, 2008). Previous research has shown that physical

E-mail addresses: haewonju@cau.ac.kr, hwju310@gmail.com.

http://dx.doi.org/10.1016/j.archger.2017.08.001
Received 20 May 2017; Received in revised form 16 June 2017; Accepted 1 August 2017
Available online 02 August 2017

activity could increase meaning in life. For example, participation in physical activity has been positively related to the belief that one's life is meaningful and goal-directed (Brassai, Piko, & Steger, 2015; Hooker & Masters, 2016), and longitudinally predicted a sense of meaning in life among the elderly (Takkinen et al., 2001). These findings imply that physical activity could boost subjective vitality through the mediational role of meaning in life.

However, very little attention has been paid to how physical activity and meaning in life work together in accounting for variation in subjective vitality. The purpose of the present study was to explore the relationship between meaning in life, physical activity and subjective vitality in older adults. Three hypotheses were tested based on guidelines on the demonstration of mediation (Baron & Kenny, 1986). First, physical activity would be positively associated with subjective vitality. Second, physical activity would be positively related to meaning in life. Third, meaning in life would mediate the association between physical activity and subjective vitality.

2. Method

2.1. Participants and procedure

A total of 239 community-dwelling elderly women participated in this study, which was conducted from May to September 2012. Participants who had no dementia or other significant cognitive impairment were recruited from four senior welfare centers in Seoul, Korea, and consented to the release of their data for research purposes. Participants' age ranged from 61 to 87 years (M = 72.44; SD = 6.76). The demographic variables in this study were living arrangement (living alone, with their family, and with only their spouse), economic status (high, middle, and low) and health status (very poor, poor, fair, good, and very good). The frequencies and percentages of the sample's demographic variables are presented in Table 1. Each participant completed a questionnaire comprising measures of demographics, physical activity, meaning in life, and subjective vitality, during a one-on-one meeting with a trained investigator.

2.2. Measures

Physical activity was assessed with two items evaluating the frequency of exercise per week and the degree thereof. Participants respond on a 5-point Likert scale (on the former item: 1 = once a week, 2 = twice a week, 3 = 3 days, 4 = 4 days, 5 = more than five days; on the latter: 1 = absolutely untrue through 5 = absolutely true), where higher scores reflect engagement in frequent exercise. An alpha coefficient of .70 was obtained in the current sample. According to Worthington and Whittaker (2006), it is acceptable to compose and use a scale with only two items, if the items are highly correlated.

Meaning in life was measured using the Korean version (Won, Kim, & Kwon, 2005) of the Meaning in Life Questionnaire (MLQ; Steger et al., 2006), which contains ten items measuring participants' appraisals that life is purposeful and meaningful. The MLQ consists of two subscales, presence of meaning and search for meaning. Responses were scored on a 5-point Likert scale anchored by "absolutely untrue" and "absolutely true," and higher scores represent a greater presence or search for meaning in life. The Korean version exhibits strong evidence of validity (Won et al., 2005) and in this sample, Cronbach's alpha coefficients for the presence of meaning and search for meaning subscales were .82 and .85, respectively.

Subjective vitality was assessed with the Korean version (Yoo & Im, 2011) of the Subjective Vitality Scale (SVS; Ryan & Frederick, 1997), which measures feelings of mental and physical vitality, aliveness, and vigor. In the Korean version of the SVS (K-SVS), composed of six items, participants respond on a 5-point Likert scale ranging from 1 (absolutely untrue) to 5 (absolutely true), where higher scores reflect a higher level of subjective vitality. The K-SVS displays strong evidence of validity (Yoo & Im, 2011), with an alpha coefficient of .77 obtained for the present sample.

2.3. Statistical analysis

Structural equation modeling (SEM) was used to test the hypotheses. The meditational model was constructed and examined using Amos 21.0 (Arbuckle, 2012). Multiple fit indices were used to evaluate the model, including χ^2, normed χ^2, the root-mean-square error of approximation (RMSEA), goodness of fit index (GFI), normed-fit index (NFI), incremental fit index (IFI), Tucker Lewis index (TLI), and the comparative fit index (CFI). An adequate fit to the proposed model is indicated by a non-significant χ^2, values $\leq$3.0 for normed χ^2, values $\leq$.08 for the RMSEA, and values $\geq$.90 for the GFI, NFI, IFI, TLI, and the CFI (Saris & Satorra, 1993).

The supplementary analyses were conducted on the basis of evidence that somatic conditions were significantly associated with decreased levels of felt energy (Contrera et al., 2016; Ryan & Fredrick, 1997). The extraneous variable, health status, was placed in the first block of hierarchical multiple regression analyses, to determine whether the meditational model would still be significant after controlling for the potential effect of health status on subjective vitality.

3. Results

The means, standard deviations and bivariate correlations of each of the measures are presented in Table 2. All of the measures significantly correlated with each other.

The mediational model of meaning in life demonstrated a satisfactory fit to the data, with $\chi^2(df)$ = 87.14(32), $p >$ .05, normed χ^2/df = 2.72, RMSEA = .08, GFI = .92, NFI = .90, IFI = .93, TLI = .90, CFI = .93. As shown in Fig. 1, the SEM results revealed a significant direct effect of physical activity on subjective vitality (β = .47, $p <$ .001) and on meaning in life (β = .32, $p <$ .001). The results also revealed a direct effect of meaning in life on subjective vitality

Table 1
Demographic characteristics (N = 239).

Demographic variables	N (%)
Living arrangement	239 (100)
Living alone	66 (27.6)
Living with family	87 (36.4)
Living with spouse only	86 (36.0)
Economic status	239 (100)
High	60 (25.1)
Middle	156 (65.3)
Low	23 (9.6)
Health status	239 (100)
Very poor	39 (16.3)
Poor	68 (28.5)
Fair	63 (26.4)
Good	51 (21.3)
Very good	18 (7.5)

Table 2
Means, standard deviations, and bivariate correlations between measures (N = 239).

Measures	M	SD	1	2	3	4
1. Health status	2.75	1.18	–			
2. Physical activity	6.29	2.22	.20**	–		
3. Presence of meaning	19.00	3.75	.17**	.18**	–	
4. Search for meaning	19.46	3.81	.18**	.28**	.79**	–
5. Subjective vitality	21.18	3.81	.27**	.48**	.50**	.58**

** $p <$ .01.