

Korean Dance Based Gymnastic Dance Program Applying for Dementia Patient Care Spouses

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Abstract: In Korea, dementia increases exceeding and dementia care families and the elderly dementia care spouses were 39%. Dementia care families face problems like deterioration health and fatigue that leading to depressing and desperation, social isolation, and exposed to the economic problem. Therefore, the purpose of the study is verified to emphasize providing a proper provision supporting the exercise program should be activated for the dementia care spouse. Subjects were dementia care spouses participating 'Korean Gymnastic Dance' program that consists of the body movement and walking based program. 10 Participants (age 75.76 ± 4.84) trained 20 times in spring and fall. Lower leg muscle strength, dynamic balance, and static balance have measured. Data analyzed by paired *t*-test and Cohen *d* for effect size. Results of the pre-test and post-test showed lower leg strength (12.3 ± 3.02 , 15.0 ± 2.94), dynamic balance (8.79 ± 1.57 , 7.30 ± 1.99), left static balance (10.58 ± 8.27 , 13.42 ± 10.92), and right static balance (20.39 ± 20.26 , 21.72 ± 20.38). Paired *t*-test result between lower leg strength ($t = -4.045$, $p = .003$), dynamic balance ($t = 2.796$, $p = .021$) appeared significantly. Left static balance ($t = -.881$, $p = .400$) and right static balance ($t = -.451$, $p = .663$) appeared insignificantly. ES *d* appeared high lower leg strength 0.9, high dynamic balance 0.8, medium left static balance 0.3, and low right static balance 0.1. In conclusion, a proper gymnastic program will be activated for the dementia care family.

Keywords: dementia, dementia care spouse, senior fitness test, caregiving elderly, Korean Dance Gymnastics

1. INTRODUCTION

In Korea, the population of patients with dementia exceeds 700,000 individuals and is assumed to be approximately 750,488 people. This leads to an assumed dementia care partner population of 891,035 individuals and an associated annual cost of 14,633,740 won (Korea National Institute Dementia, 2019). Thus, the prevalence of dementia has risen gradually and rapidly, as the number of dementia care families has reached 3.5 million (Ministry of Health and Welfare, 2018). Moreover, in the past, approximately 39% of patients with dementia had spouses in 2014 (the Ministry of Health and Welfare, 2018; the Seoul Metropolitan Medical Center, 2014), with an increase in the number of elderly spouses and partners due to the social environment. Families of dementia patients face many difficulties, including physical problems such as fatigue and poor health; psychological and social problems such as anxiety, depression, and social isolation; and economic problems (doctorsnews, 2018). Dementia family support programs should be developed to alleviate these difficulties and the burden that is associated

with dementia support and depression (Lee & Kim, 2017). Furthermore, an article that was published by 'Aaysi Family guide for in-home dementia care' emphasized the importance of professional care for patients with dementia (Comfort home Care, 2019). Grigorovich et al. (2016) also published an article, entitled 'Adult sons and daughters differ on dementia care responsibilities; Caregiver SOS' in health and wellness that describes related difficulties. The report and the results of dementia family care suggest that the spouses of patients with dementia also tend to be elderly. Furthermore, 35.4% of dementia care families are aware of the poor health condition of the patients with dementia. Altogether, enabling 'health-related consult with dementia care experts' and 'health promotion for dementia care families' is imperative. This can be supported through exercise and physical activity programs (Dementia Center of Ministry of Health and Welfare, 2019).

Furthermore, the families of patients with dementia (Women economic, 2015) spend an average of nine hours a day providing in-home

care to patients with dementia. The Korea Institute for Health and Social Affairs released a report about improving the quality of life of patients and their families (Ko & Jung, 2016) through enabling physical, mental, psychological, and social public care for patients with dementia. The families that care for patients with dementia face problems associated with health deterioration and fatigue, which lead to depression, desperation, social isolation, and economic problems. Alleviating the difficulties that are related to these problems reduce stress, anxiety, and depression. Thus, the families that care for patients with dementia should be given the support that they require.

In this study, to propose family-based exercise support programs, promote physical, mental, psychological, and social support, promote fitness batteries for the spouses of senior patients with dementia, and generalize a proper

exercise program, a dance-based approach was investigated. For the research processing, a dance-based exercise that used Korean Gymnastic dance (KDG) was applied for families who cared for patients with dementia based on the National Community Dementia Service Center (NCDSC). Therefore, this pilot study hypothesis was assumed to verify difference between pre-test and post-test of senior physical fitness.

2. METHOD

2.1. Subject and Data Collection

A total of 13 aged male and female older dementia care spouses (76.15±7.05 Male 76.43±7.96, female 75.83±6.55) participated in the Seoul-based 'A Dementia Center Family Exercise Program' 13 subjects was extracted non-probability sampling as a purposeful sampling method.<Table 1>

Table1: General characteristics

Variable	Mean±SD	N	Frequency
Age	76.15±7.05	13	
Gender	Male76.43±7.96	7	53.8
	Female75.83±6.55	6	46.2

2.2. Korean Dance Gymnastics (KDG)

The applied exercise program consists of the 'Korean Dance Gymnastics' that composed by body movement and walking based movement. It composed of the Korean folklore dance

variation with popular Korean folklore music for the older. Basic steps and movements were combined with Korean dance variation. Breathing, tapping and meditation were performed at last <Table 2>.

Table2: Korean Dance Gymnasticsn (KDG)

Step	Exercise	Intensity	Times	duration (min)
Warm up	Basic stretch (upper & lower body)	Very lower	1	15
Main	Walking	Lower	3	3~4
	Rest	Moderate	2	2
	Arm	Moderate	1	3~4
Cool down	Breathing meditation	Very lower	1	10
	Finger exercise		1	

2.3. Intervention

2 seasons in spring and fall intervention provided with regularly total 20 times each 10 times for a week every season in 2018. Exercise

duration has lasted and exercise intensity was set to moderate intensity for the senior as WHO proposed (2018) < Table 3>.

Table3: Measurement Variables

Variable	Method	Tool
Lower leg muscular strength	- Put your feet on the floor & sit in the middle of the chair. - The arms are put together in an X- shaped shape on the chest. - Record the frequency of up & down within 30 seconds.	- Chair - Stop watch (per 30 second)
Dynamic Agility (balance)	- Sit on the middle of the chair with holding feet on the floor. - With the start signal, stand up from the chair, walk 3 meters & return to the chair to record the duration sit on the chair again.	- Chair - Stop watch
Balance	- Hold one foot at the beginning & lift both arms parallel to the ground. - Stop the examination if the leg is lowered. - Conduct a one-time pre- practice & 2 time trials, & recode best score.	- Stop watch

2.4. Measurement

In this study, lower leg muscle strength, dynamic balance, and static balance (Langhammer & Stanghelle, 2015) as 'The Senior Fitness Test' was measured. The definition of the measured variables are lower leg muscle strength that is an important predictor of frailty disorders decrease & increases the risk of falls (Guralnik et al, 2000). Lower body muscle was measured using climbing stairs, walking long distances, and taking place on chairs or floors essentially. Dynamic balance allows moving forward without losing balance (Roberts & Wilson, 1999)

that is related to aging. Balance increases the walking of the flat land, crowded places, slippery ground, going upstairs, balancing common measures (Langhammer & Stanghelle, 2015).

2.5. Reliability

The reliability of paired t-test was as below. Cronbach's Alpha was the lower leg strength .572, dynamic balance .603, left static balance .446, and right static balance .840. Intra Class Correlation Coefficient was the lower leg strength .570, dynamic balance .603, left static balance .391, and right static balance .824 <Table 4>.

Table 4: Chronbach's α & ICC

Trial	Variable	Chronbach α & ICC		95% CI	
				Lower	Upper
Pre-test X post-test	Lower leg strength	.572	.570	-.730	.893
	Dynamic balance	.603	.603	-.598	.901
	Left static balance	.446	.391	-1.451	.849
	Right static balance	.840	.824	.290	.849
<i>p</i> < .05					

2.6. Data Processing

Data were conducted using SPSS 22.0 and AMOS 22.0 programs. Descriptive statistics, frequency analysis, paired t-test, correlation analysis, & effect sizes were analyzed. For reliability analysis, Intra-Class Correlation Chronbach α and Inter-Class Correlation Pearson's r were applied to analyze. Cohen d was used to present for effect size. type-I error critical value of α .05 by two-tailed test.

necessity of physical fitness for the senior spouses of patients with dementia. Moreover, the development and application of general exercise programs appeared to be statistically significant.

3. RESULTS

By analyzing these data, we verified the **Table 5:** Descriptive analysis & paired t-test (p < .05)

For the spouses who cared for patients with dementia, 'KDG' was applied twice. Through descriptive analysis, the pre-test and post-test $M \pm SD$ showed differences in lower leg strength (12.3 ± 3.02 , 15.0 ± 2.94), dynamic balance (8.79 ± 1.57 , 7.30 ± 1.99), left static balance (10.58 ± 8.27 , 13.42 ± 10.92), and right static balance (20.39 ± 20.26 , 21.72 ± 20.38) <Table 5>.

Trial	Variable	M \pm SD
Pre-test	Lower leg strength	12.3 \pm 3.02
Post-test		15.0 \pm 2.94
Pre-test	Dynamic balance	8.79 \pm 1.57
Post-test		7.30 \pm 1.99
Pre-test	Left static balance	10.58 \pm 8.27
Post-test		13.42 \pm 10.92
Pre-test	Right static balance	20.39 \pm 20.26
Post-test		21.72 \pm 20.38

In our analysis of the differences between the pre-test and post-test values of the four variables, significant probabilities were observed. The results of the paired t-test were statistically lower for leg strength ($t = -4.045$, $p = .003$) and dynamic balance ($t = 2.796$, $p = .021$), which showed a significant difference between the two tests ($p < .05$). However, the left static balance ($t = -.881$, $p = .40$) and right static balance ($t = -.451$,

$p = .663$) showed no significant difference between the two tests ($p > .05$).

The results of the paired t-test Effect Size show between pre-test and post-test verified by Cohen's d to support sample size bias were in the lower leg strength 0.9 high, dynamic balance 0.8 high, left static balance 0.3 medium, and right static balance 0.1 low <Table 6>.

Table 6: Descriptive analysis & paired t-test

Trial (test)	Variable	t	p (p<.05)	Cohen d
Pre-test	Lower leg strength	4.045	.003	0.9
Post-test				
Pre-test	Dynamic balance	2.796	.021	0.8
Post-test				
Pre-test	Left static balance	-.881	.400	0.3
Post-test				
Pre-test	Right static balance	-.451	.663	0.1
Post-test				
p<.05				

4. DISCUSSION

Most spouses who care for patients with dementia are also elderly (World Health Organization, 2015). First, in the WHO ministerial conference on global action against dementia: meeting report, the WHO stated the need for physical, mental, psychological, and social support for health promotion. Another study reported that 78% of family members who cared for patients with dementia had to quit their jobs or reduce working hours, after which they experienced serious stress (Korea Dementia Association, 2016).

Thus, the families who care for patients with dementia face health deterioration, fatigue, depression desperation, social isolation, and economic problems during in-home care (Lilly et al., 2012). The family caregivers of patients with dementia can manage many dementia-related problems. Alzheimer’s comprises 60% of dementia cases (Nguyen, 2019; Walsh, 1998), and recently, it has been reported that over 70.2% of families who care for patients with dementia are impacted by Alzheimer’s (Korea Institute for Health and Social Affairs, Seoul Metropolitan Center of Dementia, 2018). Due to the difficulty of dementia care, the elderly spouses of patients with dementia often cannot provide proper health care to the affected patients. This study proposes a senior fitness test that can be used to evaluate the physical condition of patients with dementia.

Another study (Ali, & Bokharey, 2015) showed that catastrophizing, over generalizing, and blaming maladaptive cognition, such as fatigue and inconvenient sleep, were the most significant issues that were faced by families that cared for patients with dementia. Routine exercise provides health benefits for families who live with patients with dementia (Karuncharernpanit et al., 2016). Cuthbert et al (2016) described the positive results of a 12-week exercise program in terms of physical

function, physical activity, and psychological well-being of individuals who cared for adult patients with cancer.

Further, in a mental health study of spouses who cared for patients with dementia, patients and their spouses presented correlated depression symptoms (Deeken et al., 2018) (Armstrong et al., 2019). In another study of spouses of patients with dementia, those who cared for spouses with dementia presented an increased risk of mental health problems (Lwi et al., 2018). In the United States, studies of caregiver support interventions have limitations, since the number of informal caregiver are expected to increase. Therefore, more studies that investigate effective support options for these vulnerable groups and focus on the spouses of elderly patients with dementia are needed in the future. (Roeder & Pisani, 2018). This study found similar result to for compare a research Alzheimer and other dementia patients (ADD) (Tang et al, 2019). Our study found similar results between patients with Alzheimer’s and those with other forms of dementia (Tang et al, 2019).

This study focused on the importance of improving the health of spouses of patients with dementia and identify how caregivers interfere with the lives of patients and the level of care support that they provide. Our findings suggest the importance of further development of support services for patients with dementia.

5. CONCLUSION

In conclusion, this study showed that lower leg strength and dynamic balance of the spouses of patients with dementia can be improved by regular exercise program participation and significantly influence health-related fitness of the elderly. Therefore, the application of a proper health promotion program for spouses of patients with dementia, such as the 'Korean Dance Gymnastics,' will support the physical health and fitness of caregivers.

ACKNOWLEDGMENT

I declare there is no conflict among the authors for responsibility for publication duties.

This paper research has presented an oral presentation in 2019 Righteous Sport Culture and Olympics in Korea international conference by KAHPERD.

This research has been supported from the Pusan National University research foundation two years research project.

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Citation: Won Chung Chung, Deuk Ja Oh. Korean Dance Based Gymnastic Dance Program Applying for Dementia Patient Care Spouses. *ARC Journal of Research in Sports Medicine*.4(2): 34-39.

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