Effects of 12 weeks complex exercise program on functional fitness and

cognitive behavioral function of elderly women

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INTRODUCTION

According to the statistics of the elderly, the proportion of the population aged 65 and over in Korea is expected to increase from 14.3% to 42.5% in 2065 (Statistics Office, 2017). Among the degenerative diseases according to the increase of the elderly, especially the cognitive function decreases, which negatively affects the overall quality of life of the elderly. In addition, the increase in age increases the prevalence of senile disease, the independence and quality of life of the elderly, and the risk of falls. Specialized exercise to prevent falls is important for the elderly, but complex exercise is effective for always maintaining overall body composition and functional movement.

MATERIAL & METHODS

This study examines the effect of 12-week complex exercise program participation on functional fitness and cognitive behavioral function for elderly women over 65 who are using the senior of A city in Gyeongsangbuk-do, and proposes an effective exercise program for the elderly in the region.

This study was measured using the senior fitness test and aging index developed by Rikli and Jones (2001). Upper body strength was measured for grip strength and dumbbell lifting, lower body strength was seated on a chair, standing up, cardiorespiratory fitness was walking for 6 minutes, flexibility was sitting and bending forward to the upper body, and 3m target return was measured by measuring dynamic balance. . Eight-way gait was measured to confirm coordination. The complex exercise program for 12 weeks was performed by strength training and senior aerobics using elastic bands and balance pads. The training time was gradually increased to 10 minutes for preparatory exercise, 45 to 55 minutes for main exercise, and 10 minutes for rearrangement exercise. Statistical analysis was carried out with repeated measures and variance analysis to obtain the mean and standard deviation of each variable and to verify the interaction effect by group and time period of each group participating in this study. For data processing, the significance level was set to α = .05 using SPSS-PC (version 22.0).

Table1. Charicteristic of Participants

Total(N=52)	EG(N=27)	CG(N=25)	t	р .258	
81.67±5.51	80.85±6.06	82.64±4.74	-1.146		
2.60±3.04	3.19±3.22	1.63±2.52	1.753	.088	
148.64±6.02	150.38±4.96	146.66±6.60	2.164	.037	
54.66±10.84	56.73±10.64	52.07±10.79	1.449	.155	
18.12±2.99	18.48±3.12	17.51±2.75	.995	.328	
36.15±7.31	36.00±6.68	36.34±8.21	152	.880	
138.05±14.21	137.87±14.28	138.24±14.48	085	.933	
73.02±8.25	70.87±7.75	75.38±8.30	-1.857	.070	
75.16±12.43	73.59±15.09	76.81±8.94	855	.398	
	81.67±5.51 2.60±3.04 148.64±6.02 54.66±10.84 18.12±2.99 36.15±7.31 138.05±14.21 73.02±8.25	81.67±5.51 80.85±6.06 2.60±3.04 3.19±3.22 148.64±6.02 150.38±4.96 54.66±10.84 56.73±10.64 18.12±2.99 18.48±3.12 36.15±7.31 36.00±6.68 138.05±14.21 137.87±14.28 73.02±8.25 70.87±7.75	81.67±5.51 80.85±6.06 82.64±4.74 2.60±3.04 3.19±3.22 1.63±2.52 148.64±6.02 150.38±4.96 146.66±6.60 54.66±10.84 56.73±10.64 52.07±10.79 18.12±2.99 18.48±3.12 17.51±2.75 36.15±7.31 36.00±6.68 36.34±8.21 138.05±14.21 137.87±14.28 138.24±14.48 73.02±8.25 70.87±7.75 75.38±8.30	81.67±5.51 80.85±6.06 82.64±4.74 -1.146 2.60±3.04 3.19±3.22 1.63±2.52 1.753 148.64±6.02 150.38±4.96 146.66±6.60 2.164 54.66±10.84 56.73±10.64 52.07±10.79 1.449 18.12±2.99 18.48±3.12 17.51±2.75 .995 36.15±7.31 36.00±6.68 36.34±8.21 152 138.05±14.21 137.87±14.28 138.24±14.48 085 73.02±8.25 70.87±7.75 75.38±8.30 -1.857	

RESULTS

This study conducted a 12-week complex exercise program for 25 control groups and 27 exercise groups for 52 elderly people voluntarily participating among women aged 65 years or older who are using the local A city local convenience facilities. As a result, among the physical fitness variables, the control group decreased in the left grip force (p = .005) and the exercise group increased, resulting in an interaction effect between the periods * groups, and the control group decreased with cardiopulmonary endurance (p = .003). And the exercise group increased. In addition, significant interaction was found in upper extremity muscle strength (p = .003) and coordination stress (p = .003).

> р a .112

> b .241

c.985

a .760

b .603

c.482

a .519

b.248

c.545

a .001

b .885

c.942

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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		CG(N=25)	13.79±4.50	11.47±4.25	a .197	Variable	Group	Pre	Post
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Lt. Grip (kg)						CG(N=25)	23.80±2.86	24.70±2.54
Rt. Grip (kg) EG(N=27) 19.58±4.83 20.46±5.05 c.280 K.FES CG(N=25) 67.10±22.63 63.10±29.3 63.10±20.4 63.31 63.10±29.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.3 63.10±2.	Rt. Grip (kg)			-			FG(N=27)	24 85+3 00	25.73±2.30
Upper Strength (dumbbell/30sec) CG(N=25) 17.45±5.16 18.61±3.40 a.001 K-FES Lower Strength (stand/30sec) EG(N=27) 19.52±6.42 23.15±5.43 c.003 EG(N=27) 68.60±26.98 69.56±24.1 Lower Strength (stand/30sec) CG(N=25) 14.76±4.38 13.86±3.73 a.046 b.296 K-ABC EG(N=27) 1040.00±382.3 1062.40±39 Cardiovascular Fitness (step/6min) CG(N=25) 234.94±148.04 233.81±174.41 a.004 b.287 EG(N=27) 1040.00±382.3 1062.40±39 Cardiovascular Fitness CG(N=25) 13.03±6.12 9.75±4.85 a.013 b.397 SF-8 EG(N=27) 360.01±53.14 396.01±37. Flexibility (cm) EG(N=27) 13.61±6.95 12.58±6.48 c.177 b.397 b.533 EG(N=27) 360.01±53.14 396.01±37. Balance (sec) EG(N=27) 9.14±2.39 8.62±2.77 c.182 b.633 C.172 CG(N=25) 23.56±8.47 27.23±6.57 a.200 b.327 c.182 C.172 C.162 <td></td> <td></td> <td></td> <td></td> <td>. ,</td> <td></td> <td></td>							. ,		
(dumbbell/30sec) EG(N=27) 19.52±6.42 23.15±5.43 c.003 Lower Strength (stand/30sec) CG(N=25) 14.76±4.38 13.86±3.73 a.046 K-ABC CG(N=25) 985.38±556.65 957.14±465 Cardiovascular Fitness (step/6min) CG(N=25) 234.94±148.04 233.81±174.41 a.004 EG(N=27) 1040.00±382.3 1062.40±39 Cardiovascular Fitness CG(N=25) 234.94±148.04 233.81±174.41 a.004 b.287 CG(N=25) 358.35±48.87 393.00±43. SF-8 EG(N=27) 247.18±122.10 325.36±160.98 c.003 SF-8 EG(N=27) 360.01±53.14 396.01±37. Flexibility (cm) EG(N=27) 13.61±6.95 12.58±6.48 c.177 b.633 c.177 Balance (sec) EG(N=27) 9.14±2.39 8.62±2.77 c.182 b.053 c.182 CG(N=25) 12.56±6.47 27.23±6.57 a.200 b.282 c.182	Upper Strength _ (dumbbell/30sec)	CG(N=25)	17.45±5.16	18.61±3.40					
Lower Strength (stand/30sec) CG(N=25) 14.76±4.38 13.86±3.73 a.046 K-ABC CG(N=25) 985.38±556.65 957.14±465 Cardiovascular Fitness (step/6min) CG(N=27) 17.48±6.66 15.00±5.77 c.405 EG(N=27) 1040.00±382.3 1062.40±39 Cardiovascular Fitness (step/6min) CG(N=25) 234.94±148.04 233.81±174.41 a.004 b.287 CG(N=25) 358.35±48.87 393.00±43. Flexibility (cm) EG(N=27) 247.18±122.10 325.36±160.98 c.003 SF-8 EG(N=27) 360.01±53.14 396.01±37. Balance (sec) EG(N=27) 13.61±6.95 12.58±6.48 c.177 b.633 b.633 b.633 c.182 b.633 b.633 b.633 c.182 b.633 </td <td>EG(N=27)</td> <td>19.52±6.42</td> <td>23.15±5.43</td> <td></td> <td>EG(N=27)</td> <td>68.60±26.98</td> <td>69.56±24.15</td>		EG(N=27)	19.52±6.42	23.15±5.43			EG(N=27)	68.60±26.98	69.56±24.15
(stand/30sec) EG(N=27) 17.48±6.66 15.00±5.77 c.405 EG(N=27) 1040.00±382.3 1062.40±39 Cardiovascular Fitness (step/6min) CG(N=25) 234.94±148.04 233.81±174.41 a.004 EG(N=27) 1040.00±382.3 1062.40±39 Cardiovascular Fitness (step/6min) CG(N=25) 234.94±148.04 233.81±174.41 a.004 EG(N=27) 1040.00±382.3 1062.40±39 EG(N=27) 247.18±122.10 325.36±160.98 c.003 SF-8 EG(N=27) 360.01±53.14 396.01±37. Flexibility (cm) EG(N=27) 13.61±6.95 12.58±6.48 c.177 54.387 55.38 EG(N=27) 360.01±53.14 396.01±37. Balance (sec) EG(N=27) 9.14±2.39 8.62±2.77 c.182 55.38 55.38 55.38 CG(N=25) 23.56±8.47 27.32±6.57 3.200 56.38 56.38 56.38 56.38 56.38 56.38 56.38 56.38 56.38 56.38 56.38 56.38 56.38 56.38 56.38 56.38 56.38 56.38<		CG(N=25)	14.76±4.38	13.86±3.73		K-ABC	CG(N=25)	985.38±556.65	957.14±465.3
Fitness (step/6min) CG(N=25) 234.34±142.04 233.31±174.41 CG(N=25) 358.35±48.87 393.00±43.55 (step/6min) EG(N=27) 247.18±122.10 325.36±160.98 c.003 SF-8 EG(N=27) 360.01±53.14 396.01±37.55 Flexibility (cm) EG(N=27) 13.61±6.95 12.58±6.48 c.177 5.397 5.397 Balance (sec) CG(N=25) 10.50±2.96 11.13±4.20 a.897 b.053 EG(N=27) 9.14±2.39 8.62±2.77 c.182 CG(N=25) CG(N=25)		EG(N=27)	17.48±6.66	15.00±5.77			EG(N=27)	1040.00±382.3	1062.40±399
(step/6min) EG(N=27) 247.18±122.10 325.36±160.98 c.003 SF-8 Flexibility (cm) CG(N=25) 13.03±6.12 9.75±4.85 a.013 b.397 EG(N=27) 13.61±6.95 12.58±6.48 c.177 Balance (sec) CG(N=27) 9.14±2.39 8.62±2.77 c.182 CG(N=25) 23.56±8.47 27.32±6.57 a.200		CG(N=25)	234.94±148.04	±148.04 233.81±174.41			CG(N=25)	358.35±48.87	393.00±43.3
CG(N=25) 13.03±6.12 9.75±4.85 a.013 Flexibility (cm) EG(N=27) 13.61±6.95 12.58±6.48 c.177 Balance (sec) CG(N=27) 9.14±2.39 8.62±2.77 c.182 CG(N=25) 22.58±8.47 27.23±9.57 d.200		EG(N=27)	247.18±122.10	325.36±160.98		SF-8			
EG(N=27) 13.61±6.95 12.58±6.48 c.177 Balance (sec) CG(N=25) 10.50±2.96 11.13±4.20 a.897 EG(N=27) 9.14±2.39 8.62±2.77 c.182 CG(N=25) 12.58±6.47 27.23±9.57 a.200		CG(N=25)	13.03±6.12	9.75±4.85			EG(N=27)	360.01±53.14	396.01±37.5
Balance (sec) EG(N=27) 9.14±2.39 8.62±2.77 c.182 CG(N=25) 22 55±8.47 27 23±9.57 3.200		EG(N=27)	13.61±6.95	12.58±6.48					
EG(N=27) 9.14±2.39 8.62±2.77 c.182	Balance (sec)	CG(N=25)	10.50±2.96	11.13±4.20	a .897				
CC(N=25) 22 55+9 47 27 22+9 57 a .200		EG(N=27)	9.14±2.39	8.62±2.77					
	Coordination	CG(N=25)	23.56±8.47	27.32±8.67					

CONCLUSION

In the 12 weeks complex exercise program of this study, functional fitness variables improved significantly. It can be seen that this complex exercise program helps improve physical fitness in the elderly. However, there was no significant result in the fall efficacy, which is considered to be the result of statistically dividing the group regardless of whether or not there is a fall experience in the basic questionnaire test.