

EFFECT OF ELDERLY EXERCISES ON INCREASING MEMORY

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Abstract

The purpose of this study was to examine the effect of the elderly exercise intervention on Memory (MMSE) in the elderly in Bogor Regency, West Java. Materials and Methods by conducting interviews and observations with MMSE before intervention. The next step was to give the elderly exercise treatment to increase MMSE. After the intervention was completed, a second MMSE interview was conducted. The results of the difference in the average score of the MMSE were compared to see how far the effect of elderly exercise interventions had on memory function. The minimum number of samples is determined by the mean difference test formula before and after the intervention with a total of 11 and to maintain the drop out the number of samples is 20 subjects. with dropout criteria, if they did not participate in the exercise 3 times during the intervention. Results: The overall average \pm SD age range was 95% CI 64.4 ± 3.77 with a minimum age of 60 years and a maximum of 66 years with a 95% CI (62.4 – 66.3). Where the mean age \pm SD for men is 76.0 ± 2.82 , the average age for women is 63.6 ± 3.75 . The overall average value of several cognitive components has increased after giving the elderly exercise so that there is a cognitive influence from the elderly where the cognitive value before the elderly exercise intervention is 22.00 ± 6.010 with a 95% confidence level (95% CI) between 18.91 - 25.09 and the average cognitive value after the elderly exercise intervention was 26.53 ± 68.3 with a 95% confidence level (95% CI) between 24.53 – 28.53. Conclusion: The conclusion of the intervention before and after the elderly exercise on the effect of the MMSE value showed significant results before and after the intervention of the elderly exercise.

Keywords: Elderly; Elderly Exercises; Memory (MMSE).**INTRODUCTION**

Memory decline is natural in the elderly as developing they age (Deary et al., 2009). The prevalence of memory impairment in the elderly in India as measured using the Mental State Mather Examination (HMSE) or the Modified Mini-Mental State Examination (MMSE) was reported to vary from 3.5% in Himachal Pradesh¹³ to 5.1% in Uttar Pradesh¹⁴ and 6.5% in Kashmir. A study in Kerala, southern India, found the prevalence of memory impairment to be 11.5% in those aged over 65 years. On further assessment with the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria for Alzheimer's disease, it was found to be 15.5/1000 (95% confidence interval [CI] = 9.6/1000 to 20.0/1000) and the ratio was male. Male: female for the number of

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cases is 1:1.3. A study in Ballabgarh, Haryana found the overall prevalence of Alzheimer's disease to be 0.62% in those aged > 55 years and 1.07% in those aged 65 > years (Sengupta, Benjamin, Singh, & Grover, 2014).

Appropriate aerobic exercise with soft rhythmic music and moderate intensity for effective improvement of cognitive impairment in the elderly (Cordes, Schoene, Kemmler, & Wollesen, 2021). In various studies it is said that providing exercise interventions for the elderly can have a positive impact, namely improving memory function in the elderly and helping to reduce depression, psychologically, increasing muscle strength, reducing the risk of falling, improving balance in the elderly (Han et al., 2016). West Java Province is one of the provinces included in the top 10 with the highest number of elderly people in 2015 with a percentage of the number of elderly people of 8.5% (Kemenkes, 2016).

The MMSE is used to screen patients with cognitive impairment especially memory over time, and often to assess the effects of therapeutic agents on cognitive function, especially memory (Karamanli, Ilik, Kayhan, & Pazarli, 2015). The MMSE assesses several domains, namely time and place orientation (10 points), registration (2 points), attention and calculation (5 points), recall (3 points), and language which consists of naming objects (2 points), repetition of words (1 point), naming and executing verbal commands (3 points), and writing (1 point), writing (1 point) and copying pictures (1 point).

There is also a similar study conducted by Augusta (2021), in his research entitled "The effect of brain gymnastics on improving memory in elderly people with dementia: Narrative review" In his research produced that the effect of brain gymnastics on cognitive performance and fitness levels of elderly individuals given after traditional gymnastics. And the Brain Gym seems to have no influence.

This research aimed to examine the effect of elderly gymnastic interventions on cognition in the elderly in Bogor Regency, West Java.

RESEARCH METHODS

This study used a quasi-experimental design with pre and post-design in the elderly group ≥ 60 years. By conducting interviews and observations with MMSE before intervention. The next step was to give the elderly exercise treatment to improve memory. After the intervention package for 5 weeks, a second MMSE interview was conducted. The results of the difference in the MMSE average score compared to stage 1 before the intervention

The minimum number of samples is determined by the mean difference test formula before and after the intervention with a total of 11 and to maintain the drop out the number of samples is 20 subjects. with the dropout criterion if you don't take part in the exercise 3 times during the intervention.

RESULTS AND DISCUSSION

Table 1
Distribution of the average age, MMSE before and after the intervention

Characteristics	Mean \pm SD	Min	Max	CI 95%
Age (17)	64,4 \pm 3,77	60	72	62,4 – 66,3
Male (4)	76,0 \pm 2,82	65	71	62,50 – 71,50
Women (13)	63,6 \pm 3,75	60	72	61,35 – 65,88
Time orientation				
Before	3.29 \pm 1.49	0	5	2.53 - 4.06
After	0.88 \pm 0.33	0	1	0.71 – 1.05
Place orientation				
Before	4.35 \pm 0.99	2	5	3.84 – 4.87
After	0.94 \pm 0.24	0	1	0.82 – 1.07
Registration				
Before	6.82 \pm 0,52	5	7	6.55- 7.09
After	0	0	0	0
Attention				
Before	2.24 \pm 2.25	0	5	1.08 – 3.39
After	3.18 \pm 2.03	0	5	2.13 – 4.22
Memory				
Before	2.12 \pm 1.21	0	3	1.49 – 2.74
After	2.88 \pm 0.33	2	3	2.71 – 3.05
(Verbal) reputation				
Before	0.59 \pm 0.50	0	1	0.33 – 0.85
After	0.94 \pm 0.24	0	1	0.82 – 1.07
Writing				
Before	0.65 \pm 0.49	0	1	0.39 – 0.90
After	0.88 \pm 0.33	0	1	0.71 – 1.05
(Nonverbal) duplicate				
Before	0.41 \pm 0.50	0	1	0.15 – 0.67
After	0.65 \pm 0.49	0	1	0.39 – 0.90
(MMSE) Score				
Before	22,00 \pm 6.01	13	30	18,91 - 25,09
After	26,53 \pm 68,3	18	30	24,53 – 28,53

From the data on the characteristics of the research subjects above, it can be seen that there is an average age range \pm SD overall, namely 95% CI 64.4 \pm 3.77 with a minimum age of 60 years and a maximum of 66 years with a 95% CI (62.4 – 66, 3). Where the mean age \pm SD for men is 76.0 \pm 2.82, the average age for women is 63.6 \pm 3.75.

The overall average value of several memories components has increased after intervention in elderly exercise so that there is an influence on the memory of elderly where the value before the elderly exercise intervention is 22.00 \pm 6.010 with a 95% confidence level (CI 95%) between 18.91 - 25.09 and the average value after the elderly exercise intervention is 26.53 \pm 68.3 with a 95% confidence level (95% CI) between 24.53 – 28.53.

Table 2
Characteristic Distribution based on gender

Characteristic	N	Percent
Gener		
Male	4	23,5%
Women	13	76,5%

From the demographic data of the subjects above, it can be seen that 4 elderly people (23.5%) are male and 13 are women (76.5%). According to Folstein (1975), cognitive can be categorized as Good >24, mild impairment <23, and moderate to severe impairment <17.

Table 3
Normality test before and after intervention

MMS	Normality test	Note
Before	0,030	Normal distribution
After	0,002	Not Normal Distribution

The table above shows a significant value before the intervention is 0.030 <0.05, which means that the data before the intervention above are normally distributed and after the intervention is 0.002 <0.05, which means the distribution is not normal. Because in the cognitive normality test, the results were abnormal and abnormal, the Wilcoxon test was used.

Table 4
Result of the MMSE before and after intervention elderly exercises on elderly

MMS	N	(Mean Rank)	P value
<i>Decreased</i>	2	5,50	
Increased	14	8,93	0, 003
Remain	1		
Total	17		

Wilcoxon test results, 2 MMSE subjects decreased, 14 cognitive subjects had increased, and 1 subject remained. Statistically, it showed a significant difference $p = 0.003$ ($p < 0.05$) so H_0 was rejected and H_1 was accepted, this indicates an effect on cognitive status before and after the intervention.

The results of the research data show that the average age of the elderly is 64.41 ± 3.776 years and according to sex more women with a percentage of (76.5%). Based on the frequency of research subject data obtained before the intervention, subjects who had normal cognitive (MMSE) values were 5 people (29.4%). after the intervention of subjects who had normal cognitive (MMSE) values as many as 11 people (64.7%) and there was 1 person (5.9%) who had cognitive decline, this indicated that there was an increase in MMSE scores.

This is consistent with the research [Deary \(2009\)](#) Cognitive decline is naturally experienced by the elderly as they get older and is a common thing in the elderly aged over 65 years. Likewise, it was found that the prevalence of cognitive impairment was 11.5% of those aged over 65 years ([Sengupta et al., 2014](#)). Prospectively lower attention, image memory, processing speed, and delayed memory have worse cognitive decline ([Turowicz et al., 2021](#)).

The results of this study indicate that the intervention for elderly exercise before and after the results obtained were significant $p = 0.003$ ($p < 0.05$) but had a significant difference. Thus this research/follows several theories which state that gymnastic exercises for 15 weeks in the group given the exercise and in the group not given the exercise (control) showed a significant increase in cognitive function $p = 0.006$ after being observed in both groups (Kemoun et al., 2010).

Research Witte (2016) states that gymnastics performed for 40 minutes can affect higher cognitive processes, especially executive cognitive functions, and also exercises with repeated movements to maintain each movement dance that has been performed will produce control of attention and memory.

In a study Scherder (2014) an exercise program twice a week for 6 months for elderly adults with cognitive impairments can improve frontal lobe cognitive functions such as attention, delayed memory, and verbal fluency, but not immediately remembered. A systematic review found that physical activity improves cognitive function, in particular delayed recall, in older healthy adults (Song, Doris, Li, & Lei, 2018). Karssemeijer (2019) also stated that exercise intervention 5 times a week for 6 weeks can improve cognition. A 9% increase in the MMSE score was found in the exercise group. Asle Mohammadi Zadeh (2018) stated that short-term exercise for 60 minutes in the elderly with a history of diabetes and obesity also showed weight loss and found improvements in cholesterol and triglyceride (lipid) metabolism after the intervention.

In this study, samples were collected to check vital signs, then exercise was carried out within 30-40 minutes, then for research Menez (2022) intervention was carried out during 40 minutes. 30-40 minutes for those in Bogor from warming up to cooling down then will be followed by checking vital signs again after 10 minutes after the exercise is finished.

CONCLUSION

The conclusion of the intervention before and after the elderly exercise on the effect of MMSE values showed significant results before and after the intervention of the elderly exercise. The benefits of elderly exercise on (MMSE), it can be recommended for the elderly to do regular and targeted exercise at least 2 times a week to delay the onset of cognitive impairment especially memory as they get older.

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