

The Impact of Chess Games towards Comfortableness of Cognitive Mind on Elderly

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ABSTRACT

Background: Dementia is a part of neurodegenerative process that occurs in the elderly caused by a decline in the cognitive function. Playing a board games, for instance chess, can promote the elderly's mood as well as provide more intense time to interact with each other. It is a means to reduce the dementia effect. Based on that notion, further research is required on the impact of playing chess to elders.

Objective: This study aims to analyze the impact of chess game towards a sound mind (cognitive) on the elderly with dementia.

Method: This study employed quasi-experimental study. The population in this study was elderly with dementia in Lamongan, Indonesia. The selected method to choose the research location and population was multistage sampling method, by randomly selecting a location to be the location sample in this research, as well as in deciding the sample population. The respondents in this study were 20 people, consisting of 10 people in intervention group, and 10 people in control group who were grouped by using the formula based on Judy Bean's formula in her research. The independent variable was chess game, and the dependent variable was a sound mind (cognitive). The data were collected using MoCA-Ina questionnaires and then analyzed using Paired T-Test and Independent T-Test with a significance level of $\alpha \leq 0.05$.

Results: The results suggested that chess game could provide a sound mind (cognitive) on elderly with dementia in the intervention group ($p=0.000$), and there was no influence in the control group ($p=0.758$). There was a different level of sound mind (cognitive) between the intervention group and the control group ($p=0.008$).

Conclusion: It can be concluded that chess game could generate a sound cognitive mind for elders, that may lead to a declining effect of disease. Elders became more active in thinking than before and their long term memory span increased.

Keywords: chess game, sound mind (cognitive), dementia, elderly

Introduction

Dementia is a neurodegenerative process with cognitive decline symptoms, including memory, language, attention, executive function, and visuospatial function decrease. The symptoms of dementia include decreased memory, difficulty in communicating, and

alterations in mood and habits⁽¹⁾. There are various ways that may be applied to maintain cognitive functions to keep the dementia level from being worse. Chess game is one of cognitive activities. Nevertheless, the impact of chess games towards a sound mind (cognitive) on elderly with dementia still requires a further research⁽²⁾.

A cognitive function decrease is one of the dementia symptoms. Dementia is a neurodegenerative process with symptoms of cognitive impairments, including both short and long-term memories, as well as intellectual decline. The cognitive decline can cause a decrease in the comfort level, making it difficult for the elderly to receive information⁽³⁾.

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Comfortableness in mind of human brain can be achieved if the cognitive function is in a good condition. Cognitive function is the ability to recognize conditions associated with experience and intelligence. Cognitive abilities include memory, attention, executive functions, language skills and visuospatial functions ⁽⁴⁾. Fitzpatrick (2013) and Sitzman (2011) developed Kolcaba's Theory of Comfort with the main concept referred to as the Health Care Needs defined as the need to obtain comfort and to rise from a stressful situation. The needs include physical, psychospiritual, social, and environmental needs obtained through monitoring, verbal and non-verbal reports, pathophysiological parameter-related needs, education and support, as well as the need for financial counseling and intervention ⁽⁵⁾.

Chess game is a game played by moving pieces from one cell to another, with the aim of capturing the opponent's pieces. This game has two aspects, namely psychological and social aspects. In the psychological aspect, this game can stimulate the minds of the elderly who play it into a comfort state. On the social aspect, this game allows the elderly who play it to interact with each other, resulting in a social comfort increase ⁽³⁾. Chess games performed as interventions for 14 sessions in 2 weeks with the duration of 30 minutes can enhance the cognitive function. In this study, the duration lasted 60 minutes. The objective of this study was to analyze the impacts of chess game towards comfortableness of mind (cognitive) on elderly with dementia in Karanggeneng Village, Lamongan Regency, Indonesia.

Material and Method

The research design was a quasi-experiment, which is a research method that aims to reveal cause

and effect by involving control groups in addition to the experimental group ⁽⁶⁾. In this research, a pre-test was performed before giving treatment, followed by a posttest after giving treatment.

Population, Sampling and Samples: The covered population in this study was 36 people with dementia aging 60 to 74 years-old. The inclusion criteria of this research were the elderly who were able to communicate, had the experience or could play chess, and were cooperative. The method used for the location selection was multistage sampling method, which was to randomly choose a location to represent sample locations in the study. This study selected one of the sub-districts in Lamongan from 27 sub-districts, followed by choosing one village from 474 villages randomly. The sample selection applied a simple random sampling approach to represent the population, determined by the researchers. This study employed two variables, i.e. chess game as the independent variable and comfortableness of mind (cognitive) as the dependent variable ⁽⁷⁾.

Data Collection and Processing: The instrument used to regulate the dependent variable in this study was the Montreal Cognitive Assessment that had been modified into Indonesian, abbreviated into MoCA-INA, both in the pre-test and the post-test. The complete MoCA-INA consisted of 13 test items covering 8 domains of visuospatial/executive (3 items), naming (1 item), memory (1 item), attention (3 items), language (2 item), abstract (1 item), repetition (1 item), and orientation (1 item). The highest score was 30 points. The score of 26-30 was translated as a normal condition while the score of less than 26 was labelled as below normal. Data is processed by Software Product & Service Solution (SPSS).

Result

Table 1: Results of pretest and posttest of comfortableness of mind (cognitive) in both the control group and intervention group

No.	Pre	Intervention group				No.	Pre	Control Group			
		Classification	Post	Classification	Δ			Classification	Post	Classification	Δ
1	15	Below Normal	19	Below Normal	+4	11	22	Below Normal	22	Below Normal	0
2	22	Below Normal	25	Below Normal	+3	12	20	Below Normal	19	Below Normal	-1
3	19	Below Normal	21	Below Normal	+2	13	17	Below Normal	18	Below Normal	+1
4	21	Below Normal	25	Below Normal	+4	14	19	Below Normal	17	Below Normal	-2
5	24	Below Normal	26	Normal	+2	15	24	Below Normal	24	Below Normal	0
6	20	Below Normal	23	Below Normal	+3	16	20	Below Normal	20	Below Normal	0

Conted...

7	17	Below Normal	21	Below Normal	+4	17	21	Below Normal	22	Below Normal	+1
8	21	Below Normal	25	Below Normal	+4	18	19	Below Normal	20	Below Normal	+1
9	23	Below Normal	26	Normal	+3	19	23	Below Normal	23	Below Normal	0
10	21	Below Normal	24	Below Normal	+3	20	16	Below Normal	15	Below Normal	-1
Mean		20.3		23.5		+3.2		Mean		20.10	
										20.00	
										-0.1	

Based on Table 2, there was a difference between comfortableness of mind (cognitive) scores in the intervention group and the control group, where the highest deviation for the intervention group is +4 and the lowest score is 15. In the control group, the highest deviation is -2 and the lowest score is 15.

Table 2: Respondent distribution based on pretest and post test of mind comfortableness (cognitive) in both the control group and the intervention group

No.	Comfortableness of mind (cognitive)	Intervention Group				Control Group			
		Pre		Post		Pre		Post	
		N	%	N	%	N	%	N	%
1	Normal	0	0	2	20	0	0	0	0
2	Below Normal	10	100	8	80	10	100	10	100
Total		10	100	10	100	10	100	10	100
$\alpha \leq 0.05$									
Paired T-test		p = 0.000				p = 0.758			
Independent T-test		p = 0.008							

Table 2 demonstrates the results of the Paired T-Test statistical test in the intervention group where the p value obtained is less than α ($\alpha \leq 0,05$) namely p = 0.000. The different results were indicated in the control group where the p value were greater than α ($\alpha \leq 0.05$), namely p = 0.758. The results of the Independent T-Test statistical test in both intervention group and control group obtained p value of less than α ($\alpha \leq 0.05$), namely p = 0.008.

Discussion

Based on the research results, the average score of the pre-test of the comfortableness of mind (cognitive) in the control group was 20.10 and the average score of the post test amounted to 20.0 with an average score decrease of -0.1. The results of the Paired T-Test statistical test demonstrated a p value of 0.758. This means that there was no significant change in the value of comfortableness of mind (cognitive) in the control group. Eighty percent of the respondents in the control group had a smoking habit, and 40% of them had a hereditary history of dementia which was more than the percentage in the intervention group. in the control group, there was also no stimulation to retain comfortableness

of mind (cognitive). The results of the Independent T-Test, as a comparison between the intervention group and the control group, proved that on the post-test, the chess game intervention generated a p value of 0.008.

In the visual function, the visual process begins with a series of cells and synapses that carry visual information from the environment into the brain to be processed. This process involves the retina, the optical nerves, the optical tract, the lateral geniculate nucleus (LGN), the optical radiation, and the striate cortex. Then, it proceeds further to the thalamus which is a part of the limbic system⁽⁹⁾. Likewise, in the kinesthetic functions, stimulus is received by the skin which is the outermost part of the body. It is then passed on by afferent nerves to the spinal cord, then to the parabrachial complex, periaqueductal grey, and ends in the limbic system⁽¹⁰⁾.

All stimuli and information that has arrived in the limbic system are processed by the hippocampus and amygdala. The hippocampus is a part of the limbic system that regulates memory formation, while the amygdala is a part that regulates emotions and feelings. The stimuli and information are then processed to the pre-frontal cortex⁽¹¹⁾. If conducted repeatedly, this process will

affect the comfortableness of mind (cognitive) on the elderly with dementia.

Other factors that support an increase in the level of mind comfortableness (cognitive) are the level of the respondents' education, employment, coffee consumption (lifestyle), and heredity factor⁽¹²⁾. The higher the level of one's education, the easier for them to receive cognitive stimulation in the brain. If the brain is often used to think actively, both in daily activities and in working situation, its performance can be affected and makes it capable of slowing down the cognitive function degeneration⁽¹³⁾. In this study, comfort was obtained from the intervention of chess games, making the mind (psychology) and social state of the respondents comfortable⁽⁴⁾. Mind comfortableness was also influenced by the intervening variables include internal factors such as genetics, age, and gender as well as external factors such as education, employment, and lifestyle⁽¹³⁾.

In this study, the elderly who tried to minimize the impact of dementia would also be influenced by related institutions, including the elderly's groups and communities, the community clinics, and also the hospitals⁽¹⁵⁾. The elderly will also consider where they can seek treatment, by looking for institutions that have good policies and services to reduce the impact of dementia, as well as affordable prices in every health service⁽¹¹⁾. The limitations of this study is that the proportion of respondents were entirely male so that the results obtained cannot represent female clients.

Conclusion

Based on the objective of this study, which is to determine the impact of chess game towards the elderly with dementia, this study indicated significant results for the improvement of convenience of mind in elderly with dementia by providing chess game intervention. The elderly got easier to remember things and had sharper long-term memory towards everyday problems.

Ethical Clearance: The research process involves participants in the survey using a questionnaire that was accordant with the ethical research principle based on the regulation of research ethic committee. The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, nonmaleficence, and justice.

Conflict of Interest: There are no conflict about interest of this paper and paper guaranteed 100% safe from conflict

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