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Improving Cognitive Performance with Board Activities in Older Adults

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Abstract

Cognitive function decline is one of the problems that is often experienced as we age, and this has an impact on activities of daily living (ADL), social participation, employment, psychological conditions, and independence of pre-elderly and elderly. To maintain cognitive abilities, interventions in the form of cognitive activities are needed. The purpose of this study was to determine the effect of the Monopoli Modified Board Game (Indonesian Version) on the cognitive abilities of pre-elderly and elderly. The method used was pre-experimental one-group pretest and posttest, with 28 subjects from the elderly community RW 8, Kemiri, Kebakkramat, Karanganyar. Data collection was carried out using the Montreal Cognitive Assessment Indonesian Version (MoCa-Ina) instrument, and the modified monopoly game was conducted in 8 sessions for eight weeks. The results showed that there was a significant effect of the Monopoly Modified Board Game on the cognitive abilities of pre-elderly and elderly, with a paired t-test value of Sig. (2-tailed) = 0.001, which means the p-value <0.05. The mean difference of 2.25 indicates an increase in cognitive abilities after the intervention. The majority of research subjects were female, with a pre-elderly age category of 53.5%, most were not working (60.7%), and had the last education at a low level (75%). The implication of this study shows that the Monopoli Modified Board Game (Indonesian Version) can be an effective alternative intervention in improving cognitive abilities in pre-elderly and elderly, so that it can help them maintain independence and a better quality of life.

Keywords: Cognitive impairment, Monopoly, Dementia

INTRODUCTION

Indonesia has now entered an ageing population, experiencing a very drastic increase in the number and proportion of older adults. In 2021, the number of older adults will be around 27.1 million, or around 10% of the total population in Indonesia. In 2025, the number of older adults is predicted to increase to 33.7 million people (11.8%) (Ministry of Health of the Republic of Indonesia, 2021).

Ageing is a process that occurs in human life. Getting old is a scientific process that means a person has gone through 3 stages of life stages, namely childhood, adulthood, and getting old (Sari & Herawati, 2018). Ageing can also be defined as the process of ageing, or it can also be referred to as the process of degenerative ageing that can have an impact on changes in humans; not only physical changes can occur in cognitive, psychological, social and sexual feelings (Pragholapati et al., 2021).

This study focuses on the cognitive abilities of pre-elderly and elderly people. Cognitive ability is a process of knowing and becoming more precise, attentive, thinking, knowing, learning, and making decisions. It is a structure that involves a process that uses

science, including perception, sensation, learning, attention, memory ability, language, and thinking (Dania & Novziransyah, 2021).

Cognitive function decline in pre-elderly and elderly individuals occurs when there is a decrease in speed, agility, and thought processes related to using the five senses: attention, memory, and motor and visual functions in distinguishing, comparing, and contrasting. Santrock also said that when entering old age, the elderly will choose information that is relevant to them because when entering old age, they will have difficulty digesting and understanding new information, especially if the information is in large quantities (Djajasaputra & Halim, 2019). The decline in cognitive function in the elderly can affect their daily activities (ADL), social participation, leisure, work, and independence (Yusefa et al., 2023).

Engaging in cognitively engaging "board games" can reduce the risk of cognitive function problems in pre-seniors and seniors. A board game is one in which a board and pawn or the like are used as a game tool, and the game has certain rules (Ayuni et al., 2022).

In this study, the board game used is a Monopoly game that has been modified. The modified Monopoly board game used has been designed and modified from the original version of Monopoly itself. The things that have been modified include a chance card that is changed into a card that contains questions that require cognitive ability, the monopoly board that has been modified by only containing cities in Indonesia, the money used in this game is new rupiah toy money, and simplify the rules of the game, purchase, and sale so that they can be suitable for the elderly. The modified Monopoly board game is designed to help the cognitive abilities of the elderly in terms of memory, thinking, consideration, problem-solving skills, and financial orientation skills.

Measurements were made in 2023 regarding cognitive decline in pre-elderly and elderly in RW 8 Kemiri, Kebakkramat District. It was found that in Kemiri the average pre-elderly and elderly experienced a moderate decline in cognitive function, so that efforts were needed to improve cognitive function in pre-elderly and elderly people in RW 8 Kemiri. Based on the above background, the purpose of this study is to determine and analyze the effect of the modified monopoly board game (Indonesian Version) on the cognitive abilities of pre-elderly & elderly people in the elderly community RW 8, Kemiri, Kebakkramat, Karanganyar. So that the benefit in this study is to contribute to efforts to improve the cognitive function of pre-elderly and elderly through educational board game interventions, especially the modified Monopoly game (Indonesian Version). With the results of this study, it is hoped that it can be a reference for the elderly community, health workers, and families in providing activities that can help maintain and improve cognitive abilities, and improve the quality of life of pre-elderly and elderly.

RESEARCH METHODS

This study is a quantitative research using a one-group pretest and posttest design. The population in this study is pre-elderly and elderly, and they participate in the elderly community in RW 8, Kemiri Village, Kebakkramat, Karanganyar. The sampling technique uses total sampling so that all pre-elderly and older adults who participate in the elderly association in RW 8, Kemiri Village, Kebakkramat, Karanganyar are the samples in this study, totalling 28. The instrument used in this study was the Montreal Cognitive Assessment (MoCa-Ina), which was taken before and after the intervention. The intervention using the modified monopoly board game was carried out using five board game packages consisting of 5-7 players, carried out in groups or individually for eight

intervention sessions for 30-45 minutes. The normality test in this study used Shapiro-Wilk, and the hypothesis test used a paired sample T-test.

RESULTS AND DISCUSSION

The intervention was conducted at the RW 8 elderly association, Kemiri Village, Kebakkramat, Karangnyar, from August 2023 to September 2023. The research sample frequency is distributed based on age, gender, occupation, and education categories.

Table 1. Distribution of research sample frequency

Characteristic	Frequency	Percentage (%)
Age Category		
Pre-elderly	15	53,5
Elderly	12	43,0
Advanced Elderly	1	3,6
Gender		
Male	0	0
Woman	28	100,0
Work		
Work	11	39,3
Not Working	17	60,7
Last Education		
Primary Education	21	75,0
Higher Education	7	25,0

In Table 1, it is shown that the sample has an age range from pre-elderly to advanced elderly, namely 49 years to 75 years old, with samples in pre-elderly age being dominated in this study. All samples are female, the sample is dominated by non-working samples, and in the last education is dominated by a low level of education, namely the range of not school to high school.

Table 2. Assessment of Cognitive Ability of the Elderly Pre-post Intervention

Score	n	Mean	Standard Deviation
Pretest	28	21,25	4,419
Posttest	28	23,50	4,105

Table 2 shows that cognitive ability in the elderly increases, as seen in the Mean pretest-posttest intervention. This means that the average score after the post-test has increased by 2.25.

Table 3. Frequency Distribution of Cognitive Ability of the Elderly Pre-Post Intervention

Cognitive Impairment Rate	Pretest		Posttest	
	Frequency (n)	Percentage (%)	Frequency (n)	Presented (%)
Heavy	0	0	0	0
Keep	12	42,9	6	21,4
Light	11	39,3	12	42,9
Usual	5	17,9	10	35,7

Table 3 shows that the cognitive ability of the elderly, based on the pretest results, is dominated by moderate cognitive impairment. In contrast, the category of mild cognitive impairment dominates the post-test results.

Table 4. Data normality test results

Result	Shapiro-Wilk	
	n	Sig.
MoCA-Ina Pretest	28	0,815
Posttest MoCA-Ina	28	0.476

Table 4 shows the normality test results using Sapphire Wilk, which obtains the results of the normally distributed data.

Table 5. Results of paired t-test

Result	Paired Sample T-test	
	n	Sig. (2-tailed)
Pretest and Posttest MoCA-Ina	28	0,001

Table 5. shows the results of the t-test ρ value = 0.001 (<0.05), which is that the hypothesis is accepted or there is an influence of Board Game Modified Monopoly (Version Indonesia) on the cognitive ability of pre-elderly & older adults in the RW 8 elderly community, Kemiri, Kebakkramat, Karanganyar.

Parametric statistical test with Paired Sample T-test obtained a Sig. (2-tailed) value of 0.001 or p < 0.05, it can be concluded that there is an influence of Board Game Modified Monopoly (Version Indonesia) on the cognitive ability of pre-elderly & elderly in the RW 8 elderly association, Kemiri, Kebakkramat, Karanganyar.

Interventions using modern board games have been proven to improve cognitive function in the elderly (Estrada-Plana et al., 2021). The application of modified modern boards influences maintaining the cognitive function of the elderly (Istianti & Dewi, 2023). Board games significantly influence improving cognitive abilities in the elderly (Ayuni et al., 2022). Playing board games improves better cognitive function (Daeli et al., 2022). Intervention using digital board games can reduce the risk of cognitive impairment (Kuo et al., 2018).

Board games were provided 10x intervention for 20 minutes each session to measure the cognitive ability of pre-elderly and older adults in completing games (Pae et al., 2021). In this study, the intervention was carried out eight times, one time a week, and lasted 30-45 minutes.

The cognitive activity used in the research was a board game, namely a Monopoly game. Monopoly games are board games played by players who compete to collect wealth in the form of money and territory using the game's rules (Desyawati et al., 2021). Monopoly games are able to improve the cognitive abilities of pre-elderly and elderly in terms of memory, train brain skills in complex thinking, practice problem-solving and decision-making, practice strategizing, and practice financial management (Gani, 2022).

The intervention carried out in this study in the form of a modified Monopoly game (Kuang et al., 2021) aims to maintain cognitive abilities in pre-elderly and older adults. The modifications that have been made to the modified Monopoly board game used are by simplifying the way to play and helpful game rules to make it easier for the elderly to play and train their ability to strategize in order to win games, boxes containing cities in the region/region of Indonesia in order to increase the knowledge of the elderly about cities in Indonesia and typical buildings in those cities, and money using rupiah money to train the elderly in financial management, and opportunity cards that are converted into cognitive cards that are useful for the cognitive abilities of pre-elderly & elderly. The cognitive cards used in this game are cards in which some questions refer to cognitive sub-tests that are useful for the elderly in visuospatial/executive skills, management, memory, attention, language, abstraction, delayed recall, and orientation.

During the game in addition to the game serving the cognitive function of the pre-elderly and elderly, the Modified Monopoly Board Game intervention is also able to improve the ability of the pre-elderly and elderly in social interaction because each session of the pre-elderly and elderly will have good interaction when rolling the dice, helping other players who are struggling, and talking to each other. This is beneficial for the cognitive abilities of the elderly with social interaction and minimizing the occurrence of stress in the elderly. Older adults who are active in social interaction with others or have an emotional attachment to those closest to them by responding to social interactions will have a good cognitive function (Situngkir et al., 2022). From the research that has been carried out, it is found that the intervention carried out in this study using the Board Game Modified Monopoly (Indonesia Version) has a good influence on cognitive ability in pre-elderly and older adults.

CONCLUSION

The Modified Monopoly Board Game's provision affects the cognitive ability of pre-elderly and older adults in the RW 8 elderly community, Kemiri, Kebakkramat, Karanganyar. Board Game Modified Monopoly was effective in increasing the Montreal Cognitive Assessment (MoCa-Ina) score in 28 samples of pre-elderly and older adults in the RW 8 elderly community, Kemiri, Kebakkramat, Karanganyar after eight interventions in 30-45 minutes each session. Modified Monopoly Board Games have a positive effect on maintaining the cognitive abilities of the pre-elderly and the elderly, maintaining the cognitive abilities of the pre-elderly and the elderly, and reducing the risk of cognitive decline in the pre-elderly and the elderly. In addition to cognitive abilities obtained, during the intervention, there was also a positive influence on social interaction skills in pre-elderly and older adults. Based on the findings, it is recommended that the Modified Monopoly Board Game be incorporated as a regular cognitive and social activity in elderly communities. Health practitioners, caregivers, and community organizers should consider integrating this game into cognitive rehabilitation programs to maintain and enhance cognitive health, as well as promote social engagement. Further research could explore the long-term effects of such interventions on cognitive decline, as well as adapt similar cognitive games for broader use in various elderly communities. These initiatives could help sustain cognitive function and improve the overall well-being of the elderly population.

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