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# Playing Cards Using the "Tepuk Nyamuk" Method Improves Cognitive Function and Social Interaction in the Elderly

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## ABSTRACT

Playing cards using the *"tepuk nyamuk"* system is a game using a standard 52-card deck to focus between the words spoken on the card that is to be issued while tapping the back of the hand between the players on the card. The study aimed to find out the effect of playing cards using the *"tepuknyamuk"* method on improving cognitive function and social interaction.This study was quasi-experimental with 30 respondents who were elderly individuals who experienced cognitive decline and social interactions. The independent variable was playing cards in the *"tepuknyamuk"* method and the dependent variables were cognitive function and social interaction. The results indicate that there was an influence from playing cards on cognitive improvement (p=0.000) and social interaction (p=0.000). Playing cards in the *"tepuknyamuk"* method has the positive effect of improving cognitive function and social interaction for older adults. Further studies are suggested to determine the effect playing cards on other cognitive components.

***Keyword:*** *playing cards in the "tepuknyamuk" method, cognitive, social interaction, elderly*

## Introduction

The elderly experience normal cognitive decline problems across all aspects including a decrease in memory, language, thoughts and considerations.[1] In general, the prevalence of dementia and Alzheimer's is 3-10% at 65 years of age and it ranges from 25-50% at the age of 85 years and above.[2]

Based on a preliminary study, 40 out of 138 (28.29%) older adults experienced cognitive decline. The risk factors for decreased cognitive function include age, sex, education, area of residence, reduced physical and social activity and diseases such as those that are cardiovascular in nature, diabetes mellitus, hypertension and cerebrovascular issues.[3] The decline in cognitive function needs to be overcome because it plays an important role in daily activities such as decision making, thinking and remembering things.[1] The impact of cognitive decline is dementia and in the long term, this can cause Alzheimer's disease.[4]

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The risk factors that affect the decline in social interactions include health, family problems and social support.[5] The impact of a decrease in social interaction is cognitive impairment and this can also trigger social isolation.[5] The research conducted by Zhu et al, found that recreational activities can improve cognitive function and social interaction because there are many activities such as walking, cycling, gymnastics and playing puzzles that facilitate cognitive enhancing hippocampal neurogenesis, synaptic plasticity and neurotropics.[6] The problems can also be overcome using playing cards. Based on research studies conducted in Columbia and Sweden, playing cards can improve cognitive function and social interaction in the elderly.[7] The positive effects of playing cards includes building social relationships, developing skills and cognitive thinking.[8] The purpose of the research was finding out the effect of playing cards using the "tepuk nyamuk" method on improving cognitive function and social interaction in the elderly in a nursing home.

## Method

**Study Design, Setting and Sampling:** The study was quasi-experimental. The samples consisted of 60 respondents (30 in the treatment group and 30 in the

control group) who were staying at UPTD Griya Werdha and Hargo Dedali nursing home in East Java, Indonesia. The inclusion criteria in this research was older adult who could sit. Those with hearing loss and older adults who were color blind were excluded. The research was conducted in the treatment group by providing cards played with the "tepuknyamuk" method 5 times over 2 weeks with a duration of 15 minutes taken for each meeting. The data was analyzed using the Wilcoxon signed and Mann Whitney tests.

## Results

In the treatment group, the results for the cognitive function were higher than before (Table 1). The result of the statistics tests showed significant differences in the cognitive values pre- and post-test. These results indicate that the game can improve the cognitive function of the elderly, especially when based on the components of orientation, attention and language. The results of the Mann Whitney analysis showed significant differences in the cognitive values in the pre-test in both the treatment and the control group (Table 2). In the treatment group, there was a difference pre- and post-test in the components of social interaction concerning cooperation and conformity. Based on the results of the statistics test on the ability of social interaction, the treatment group showed a significant difference in relation to the cognitive values during the pre-post test. The results of the Mann Whitney analysis showed that there were significant differences between the social interaction skills pre-test in the treatment group and in the control group.

**Table 1: Distribution of the cognitive function of the treatment group (n = 60)**

| Category | Orientation | | Registration | | Attention | | Memory | | Language | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Healthy | 11 | 17 | 29 | 29 | 14 | 18 | 29 | 29 | 22 | 23 |
| Moderate | 11 | 6 | 1 | 1 | 9 | 9 | 1 | 1 | 8 | 7 |
| Severe | 8 | 7 | 0 | 0 | 7 | 3 | 0 | 0 | 0 | 0 |

**Table 2: Distribution of the cognitive function between the treatment and control groups (n = 60)**

| Cognitive function | Treatment group | | | | Control group | | | |
|---|---|---|---|---|---|---|---|---|
| | Pre | | Post | | Pre | | Post | |
| | n | % | n | % | n | % | n | % |
| Healthy | 14 | 46.6 | 17 | 56. 6 | 3 | 10 | 3 | 10 |
| Moderate | 12 | 40 | 9 | 30 | 6 | 20 | 6 | 20 |
| Severe | 4 | 13.3 | 4 | 13. 3 | 21 | 70 | 21 | 70 |
| Wilcoxon Signed Rank test | | | p=0.000 | | | | p=1.000 | |
| Mann Whitney | | Pre test | | | p=0.000 | | | |
| Mann Whitney | | Post test | | | p=0.000 | | | |

**Table 3: Distribution of the social interaction in the treatment group (n = 60)**

| Category | Social interaction component | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Cooperation | | Competition | | Contradiction | | Conformation | |
| | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Good | 24 | 24 | 24 | 25 | 27 | 28 | 17 | 19 |
| Adequate | 4 | 6 | 4 | 3 | 3 | 2 | 12 | 11 |
| Deficient | 2 | 0 | 2 | 2 | 0 | 0 | 1 | 0 |

**Table 4: Distibution of the social interaction in the treatment and control groups (n = 60)**

| Social interaction | Treatment group | | | | Control group | | | |
|---|---|---|---|---|---|---|---|---|
| | Pre | | Post | | Pre | | Post | |
| | n | % | n | % | n | % | n | % |
| Good | 25 | 83.3 | 28 | 93.3 | 19 | 63.3 | 19 | 63.3 |
| Adaquate | 5 | 16.6 | 2 | 6.6 | 11 | 36.6 | 11 | 36.6 |
| Deficient | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wilcoxon Ranked test | | | p=0.000 | | | | p=1.000 | |
| Mann Whitney pretest | | | p=0.012 | | | | | |
| Mann Whitney posttest | | | p=0.000 | | | | | |

## Discussion

The respondents liked the game because they understood the flow of the game and the respondents were scrambling to be guides for their group team. This causes the respondents to understand the game training quickly and they will also often invite other respondents to stay focused and to practice continuously. The elderly who practice using their brain more often can slow cognitive decline.[10]The brain can be stimulated by playing cards using the "tepuknyamuk" method that have many types of shapes as well as strategy-based game rules. All of these elements will stimulate the limbic system which will be processed by the hippocampus and amygdale. This is passed on to the cortex's prefrontral.[11] The stimuli that enters the prefrontal will stimulate the prefrontal to work according to its functions such as planning, organizing and solving problems. The prefrontal responses to thinking will affect the increase in cognitive function.[7] "Tepuknyamuk" cards are one of the games that can improve cognitive function because of the elements of the game.

This research shows the influence of the orientation ability of the elderly. Orientation includes short-term memory. Short-term memory includes verbal memory, namely by assessing new memories about orientation and assessing the ability of the individual strategies to learning new things. Playing cards with the "tepuknyamuk" method was a game that was still unknown to the elderly because it used different methods and strategies to what they were used to. This meant that they had to practice their orientation skills. The provision of memory stimulation affects the level of orientation ability in the elderly. Playing cards are a good method for improving the orientation of the elderly because the games can make the elderly focus on what they were told. In this study, there was no increase in memory components and registration.[12] All of the respondents pre-test were in the good category, so for the post-test, the value of memory function and registration remained 3. The limbic system is part of the amygdale, which functions to control emotions and memory processes by stimulating the hippocampus.[13]

The limbic system stimulates aspects of memory and registers it in the cognitive function component. Information storage is a part of the synapses. Synapse facilities affect the subconscious mind processes which gives rise to perception or memory. The hippocampus is long-term memory that can store relatively permanent information.[14]During the game, the respondent will recognize the stimulus of the playing cards based on the patterns and colors. This stimulation will stimulate the limbic system, especially the hippocampus, and encourage the recall of past memories of playing cards, the card patterns and the used colors.[13]These elements on the playing cards can stimulate the brain so then it can improve short-term memory. The hippocampus is also a learning center that will continue to be honed through the method of "tepuknyamuk". This should be carried out continuously so then it can improve cognitive function. Playing cards is entertaining because it is done together with fellow older adults and this can lead to happy and pleasant feelings.

Older adults who previously felt alone because they have not adapted to the environment and who rarely interact can feel happy as a result of the positive interactions that occur during the game. Giving them attention means directing the mind to something that needs to be learned and remembered. For example, remembering numbers and counting down. In information processing, memory involves the process of

encoding, storing and recalling. The results of the study showed that memory training for attention/calculation in the elderly is influenced by the processing speed and effectiveness of the strategies used to improve the elderly in terms of learning to memorize numbers, sequence numbers and counting down. Processing speed is influenced by several factors including age, education and verbal ability.[7] Playing cards are a good method to improve attention/calculation, because from the game, the elderly can practice numbers and letters from the cards that are issued.

The working memory increased when the elderly completed the task in terms of language using a collection of word lists, naming and following orders. This was influenced because the ability of the elderly in relation to re-evaluating tasks in terms of language uses and learning strategies related to ways of thinking and taking action in different situations. Playing the cards is a good method to improve the language component of the elderly. This is because the game trains the elderly to follow orders from the guide.[15]

The results of the study have shown an increase in the components of cooperation, competition, contradiction and conformation. The respondents were very happy with playing cards using the "tepuknyamuk" method because the respondents scrambled to be guides on their team and they exchanged stories during the break. This caused the respondents to motivate the other respondents to stay focused and to practice continuously. Through social interaction, the elderly can think more positively and optimistically about life. The elderly who play games more often experience a positive effect; one of them was tolerance between the players, which can improve social interactions in the elderly.[4]

The results of the study showed the effect on the ability of cooperation in the elderly, with the existence of the game requiring the elderly to work together in groups. According to smartphones and e-tablets in perioperative medicine, the existence of good cooperation allows the elderly to get a sense of belonging to a group. They can share stories, interests, concerns and they are able to engage in creative and innovative activities together.[16] Playing cards are a good method to improve cooperation with the elderly because this game requires collaboration. Collaboration means staying in harmony with each other, cooperating to motivate each other and reprimanding if there is a loss of focus. The results of the study showed the effect on the component of competition. The results of the study 'Adequacy of Sample Size in Health Studies' said that social interaction decreases when it is supported by the attitude of the elderly, who tend to be selfish and unwilling to listen to the opinions of others. This causes the elderly to feel socially alienated which ultimately feels useless because there is no emotional distribution through socializing.[17,18] Playing cards using the "tepuknyamuk" method was a good method to increase social interaction in relation to the component of competition, because the game trains speed and focus so as not to lose at playing. The results of the study showed an increase in the component of good contradiction or opposition. Good opposition can be interpreted where the respondent never scolded the elderly. The more frequent the interactions, the more likely that there will be conflict or problems.[19]As the game progresses, the elderly do not experience opposition - this affects the ability of social interaction when it comes to trying to be better.

The results of the study showed that the majority of the treatment group experienced an increase in the component of conformity. Older adults who are active in social activities are more likely to adjust to aging well. If the elderly are active within a social involvement, then the elderly can reduce cognitive decline through the appreciation and good treatment of the environment.[20] Playing cards using the "tepuknyamuk" method was good for increasing social interaction in the component of compatibility because the game has the effect of adjusting to one's peers and the surrounding environment. The results showed that by playing "tepuknyamuk" for a short duration (2 weeks) and frequently (10 times a meeting), this can improve cognitive function and social interaction in the elderly. Based on the functional consequences theory, the elderly will experience age-related changes and have risk factors that make the health of the elderly decline.[14] The results showed that playing cards using the "tepuknyamuk" method is effective at increasing cooperation and conformity. It improves the cognitive function that occurs because the elderly individuals are actively participating in the game.

## Conclusion

Playing cards using the "tepuknyamuk" method proved that even short frequency games and durations for the meetings can improve cognitive function and social interactio. The results proved that playing cards are more effective at improving cognitive function in reference to the components of orientation, attention and language.

Social interactions are more effective at increasing cooperation and conformity. Playing cards can be done regularly to maintain the cognitive function of older adults. Further studies are strongly recommended to explore the relationship between recreational activities that may affect the cognitive functioning of the elderly.

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