

Original Research Article

EFFECT OF TRADITIONAL GAME “DAM-DAMAN” TO DECREASE
LEVEL OF DEMENTIA ON ELDERLYWimar Anugrah Romadhon^{1)*}, Joni Haryanto²⁾, Ira Suarilah²⁾¹⁾ STIKes Patria Husada Blitar, ²⁾ Universitas Airlangga

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ABSTRACT

Introduction. Elderly at risk of dementia caused by decrease in cognitive function, one of the treatments that is safe with no side effects is the reminiscence therapy with traditional game of “*dam-daman*” to increase cognitive function. The purpose of this study was to explain the effect of traditional game of “*dam-daman*” on level of dementia in the elderly. **Method.** The design of this study was Quasy Experimental design. The population was elderly in Kediri. The total sample were 20 respondents. The sampling technique was multistage random sampling method. The independent variable was a traditional game of “*dam-daman*”, the dependent variable was level of dementia. Data were collected using MMSE (Mini Mental State Examination) questionnaires and analyzed using Paired t-test and Independent T-test with a significance level of $\alpha \leq 0.05$. **Results&Analysis.** The therapeutic effect of traditional game of “*dam-daman*” to decrease level of dementia on elderly ($p = 0.000$). There was any significant difference between the control group dan the treatment group after intervention traditional game of “*dam-daman*”. **Discussion.** Traditional game of “*dam-daman*” can improve cognitive function with dementia in the elderly. Elderly can apply the traditional game of “*dam-daman*” to help them memories. The future studies could add to the respondents and determine the factors according to the characteristic of respondent.

Keywords: Cognitive Impairment, *Dam-daman*, Dementia, Elderly.

INTRODUCTION

Aging is a process of slowly decreasing the ability of the tissue to repair itself or replace itself, maintain its normal structure and function so it cannot survive against injury (including infection) and repair the damage suffered at the age of 30-70 years (An & Liu, 2016). The aging process will be experienced by all humans and most of them experience dementia or senility in old age. This condition is a challenge to maintain health and independence of the elderly so that it does not become a

burden for themselves, their families and society (Metzger et al., 2016). There is still no specific treatment for dementia, but treatment to treat symptoms can be done. One of them is by introducing reminiscence therapy with traditional dam-daman games. Damage is one of the traditional games that can train cognitive functions of the elderly brain, but the intervention of traditional games of defense against the prevention of increasing dementia still needs to be studied.

Data from World Alzheimer's Report, 2015 estimates that in 2010 there are 37 million people with dementia while showed dementia sufferers reached more than 46 million and will increase in 2025 as many as 65 million from the total world population of 7.3 billion million soul. It is estimated that the number will continue to increase by around 131.5 million in 2050 and the proportion of poor and developing countries reaches 58%. Indonesia is among the ten countries in the world that has the most dementia sufferers in 2015, which is 2.7 million or around 15% of the total number of elderly people in Indonesia (Y. P. Yang, Wang, & Wang, 2016). In East Java according to BPS (2014) the number of people with dementia reached around 634,500 million people. Kediri Regency is included in the top 5 districts in East Java which has the largest number of elderly people in 2014 with 165,061 people and around 24,759 suffering from dementia (BPS Kediri, 2014). The number of people with dementia will continue to increase if it is not immediately addressed or dealt with further.

The preliminary study 5 of 287 elderly people was conducted in Purwokerto village whose population was ranked 3 out of 16 large villages in the Ngadiluwih sub-district on May 14, 2016 with the MMSE questionnaire, resulting in

data that 3 out of 5 experienced temporal orientation disorders; 3 out of 5 experience a spatial orientation disorder; 3 out of 5 people experience attention / calculation disorders; 4 out of 5 people cannot remember well; 4 out of 5 people experience interference with verbal commands; and 4 out of 5 people experience language disorders. In the preliminary study it can be concluded that 4 out of 5 elderly people experience dementia.

Dementia is a clinical syndrome characterized by loss of intellectual function and memory, experiencing a decline in memory and other thinking power that significantly disrupts the activities of daily life (Y. P. Yang et al., 2016). Dementia attacks the elderly around the age of 65 years, increasing age, the greater the chance of suffering from dementia, which is characterized by a decrease in physical endurance the more difficult they can be cured. Physical and behavioral changes can occur in all people when they reach the stage of a certain chronological development (Yang et al & Metzger et al., 2016).

Things that can reduce the risk factors for dementia are learning activities whose function is to maintain the sharpness of memory and always exercise brain function (Spaan, 2016). In overcoming the problem of decreasing

cognitive function that has a negative impact on the elderly, nurses as health workers can use methods to reduce impaired cognitive function in the elderly. One of them is the method used to remember and talk about things in the past. This method is used for the elderly who experience cognitive impairment, loneliness and psychological recovery (Baillon, 2015 & An & Liu, 2016). Therapy for remembering the past or playing games in the past can be given to elderly individuals, families and groups (Chen, Tsai, Chao, & Clark, 2015). The Dam daman game is a type of traditional Javanese game that has been played in ancient times when the elderly was young. Traditional Dam-daman games will train the brain to think and train the elderly to find strategies that were done in ancient times when they played (Prasetyono, 2015), so the elderly will remember the memories they have done in ancient times.

Based on the above background, the researchers are interested in conducting research with the title “The Effect of Traditional Game Dam-Daman To Decrease Level of Dementia on Elderly” to find out how far the influence of traditional dam-daman in improving cognitive decline to reduce dementia in the elderly.

METHOD AND ANALYSIS

The research design is Quays-Experiment. The target population in this study was the elderly with dementia according to the criteria set by the researcher, that is according to demographic data. Affordable population in this study was the elderly with dementia in Kediri District (26 Sub districts) as many as 24,759 people. The inclusion criteria in this study were the elderly with the interpretation of the Clock Drawing Test (CDT) score ≥ 3 (L. Yang et al., 2016), the elderly who were able to communicate, the elderly who had played or could play the game and the elderly who were cooperative. Exclusion criteria in this study were elderly people who were deaf and illiterate, experienced mental disorders, impaired physical mobility.

The method used in site selection is done by using multistage sampling method, which is randomly selected for the representative place of the sample in the study. The researcher chose one of the sub-districts in Kediri Regency from 26 sub-districts, followed by choosing one village at random. The sample selection uses a simple random sampling or random sampling approach to represent the population determined by the researcher. This study has a sample size of 20 people,

consisting of 10 control groups and 10 treatment groups from all the elderly populations in Purwokerto Village, Kediri Regency.

The independent variable in this study is traditional game “dam-daman”, while the dependent variable is the level of dementia.

The instrument used to regulate the dependent variable in this study was the Mini Mental State Examination (MMSE) in the pretest and posttest (Pond et al., 2016). The MMSE as a whole consists of 30 test points covering 7 domains, namely temporal orientation consists of 5 points, spatial orientation consists of 5 points, registration consists of 3 points, attention and calculation consists of 5 points, short term memory consists of 3 points, language consists of 3 items, verbal commands consist of 6 points, the highest score is 30 points. Interval interpretation is 1-30.

The Research location was in Purwokerto Village, Ngadiluwih District, Kediri Regency. The study was conducted on June 11-25, 2016, with 8 sessions in 2 weeks. The duration of each session is 60 minutes. Pretest was performed on each client who became a respondent, in each treatment and control group. Traditional games were carried out by the treatment group, and the researchers observed each intervention using a log book. After a

damaging intervention for 2 weeks, the next step was followed by posttest to determine the final condition of the dementia level in the elderly, both in the control group and in the treatment group. The researcher then compared the results of the pre-test and post-test before and after the intervention then data analysis using Paired T-Test. To compared the levels of dementia between the treatment and control groups then data analysis using Independent T-Test.

RESULTS

Table 1 shows that respondents in the control and group groups can be seen that in the treatment and control groups all respondents were between 60-75 years old. Most of the respondents had elementary school, junior high school and undergraduate education levels of 30% and in the control group had an elementary school education level of 40%. The sex of the respondents in the treatment group and the intervention group were all comparable. All respondents in the treatment group had 2 working seniors and 8 elderlies did not work and the control group had 3 working elderly and 7 elderlies did not work. The results of the independent t-test stated the response characteristics were $p > 0.05$, meaning that there were no differences in

the characteristics of the respondents between the treatment and control groups.

Table 1. Characteristics of respondents in Purwokerto Village, Kab. Kediri in June 2016

Age	Treatment groups		Control groups	
	f(x)	(%)	f(x)	(%)
60-75 years old	10	100	10	100
76-90 years old	0	0	0	0
>90 years old	0	0	0	0
Total	10	100	10	100
Level of Education	Treatment groups		Control groups	
	f(x)	(%)	f(x)	(%)
No school	0	0	0	0
Elementary School	3	30	5	40
Junior High School	1	10	2	20
Senior High School	3	30	2	20
Bachelor degree	3	30	1	20
Total	10	100	10	100
<i>Independent T-test</i> p=0,226				
Gender	Treatment groups		Control groups	
	f(x)	(%)	f(x)	(%)
Male	4	40	4	40
Female	6	60	6	60
Total	10	100	10	100
<i>Independent T-test</i> p=0,673				
Job	Treatment groups		Control groups	
	f(x)	(%)	f(x)	(%)
Work	2	20	3	30
Does not work	8	80	7	70
Total	10	100	10	100
<i>Independent T-test</i> p=0,628				

Table 2 shows the difference in dementia level scores in the treatment and control groups, where the highest difference for the treatment group is +8 and the lowest score is 19. The highest

difference for the control group is -3 and the lowest score is 16.

Table 2. Results of pre and post test for dementia levels in the control and treatment groups

No. Respon dent	Treatment groups			Control groups		
	Pre	Post	Δ	Pre	Post	Δ
1	23	27	+4	23	22	-1
2	20	27	+7	25	24	-1
3	22	29	+7	18	18	0
4	26	30	+4	17	18	+1
5	23	30	+7	18	17	-1
6	21	28	+7	18	17	-1
7	21	29	+8	24	21	-3
8	19	26	+7	17	17	0
9	20	28	+8	18	18	0
10	21	28	+7	16	16	0
Mean	21.6	28.2	+6.6	19.4	18.7	-0.6
SD	2.011 08	1.31 656		3.27 278	2.66 875	
Paired t-test	p=0.000			p=0.066		
Independent T-test pre-test				p = 0.870		
Independent T-test post-test				p=0.000		

DISCUSSION

The results of this study indicate that respondents from the control and treatment groups were all aged between 60-75 years. Data shows that respondents entered the age group of the elderly. The problem of dementia that occurs in respondents is a degenerative process or aging process, namely the gradual disappearance of tissue ability to repair itself and maintain its normal function due to age aging experienced by humans at the age above 60 years old. The risk of dementia increases every 5 years from the age of 65, due to the increasing number of neurons in the brain that become tangled

(Neurofibrillar Tangles) and appear various plaques (Y. P. Yang et al., 2016).

Comparison of respondents in the study of men and women affected by dementia, namely 2: 3. From the study most women were respondents. Dementia mostly affects women because female hormones enter menopause more quickly than men with andropause and secondly because women's life expectancy is greater than men. Scientifically, this phenomenon can be seen from chromosome theory. The male chromosomes consist of X and Y telomeres while the female chromosomes consist of telomeres X and X. Telomer X is longer than Y telomeres. Women have two telomeres that are long, whereas men only have one telomere X, hence male age is shorter (Jones, 2003).

Data on the level of education shows that the highest number of respondents in the treatment group and the control level of elementary school education is as much as 30% and 40%. Education levels can affect the incidence of dementia. The Canadian Study of Health and Aging in 1994 explained that older people who have low education are at a four-fold risk of dementia compared to older people who are highly educated (Otenbacher et al, 2010).

Research data on employment shows that 70-80% of the elderly have not

worked in the treatment or control groups. According to Chen et al (2015), a person who is hard working / over working such as farmers and laborers can accelerate the aging process and affect cognitive function, but if the work is carried out continuously it can train the brain and can slow the decline in cognitive function.

Based on the results of the study, the average score of dementia levels in the treatment group before the intervention of dam-daman games was 21.6 and after intervention was 28.2, with an average increase of 6.2. The results of the statistical test Paired t-test as a comparison of the level of dementia between before and after the intervention of the dam-daman game in the treatment group produced a value of $p = 0.000$, whereas in the control group the value of $p = 0.066$. This means that there was a change in the value of the dementia level in the treatment group before and after the intervention of the damping game, whereas in the control group there was no significant change in the value of the dementia level.

The results of the Independent t-test as a comparison between the treatment group and the control group showed that at the pre-test results in $p = 0.870$, and at the post-test after the intervention the dam-daman game produced a value of $p = 0.000$. This

explains that there is the influence of giving traditional damages to intervention in the level of dementia in the elderly.

All respondents in this study were known to experience a decline in cognitive level which is one of the symptoms of dementia. Napitapulu (2013) states that the presence of impaired cognitive function can be one of the main indicators of dementia. The traditional dam game intervention which was given 8 times over 2 weeks proved to be able to increase the cognitive value of the elderly which was marked by an increase in the score in the MMSE (Mini Mental State Examination) questionnaire. The scientific explanation of these findings is corroborated by (L. Yang et al., 2016 & Hsieh, 2010) who stated that cognitive activity (traditional dam-daman games) can affect cognitive function in the elderly which can reduce the risk of dementia in the elderly can be reduced.

In the MMSE (Mini Mental State Examination) Questionnaire, the treatment group in the temporal orientation domain was worth 5 points and it was found that 9 out of 10 received a score of ≥ 3 , while only one elderly got a score <3 . the same as the temporal orientation domain 9 out of 10 seniors get a score of ≥ 3 , while only one elderly gets a score <3 . In the registration domain is worth 3 points, ie 7 out of 10 elderly get a score of 3, while 3

other elderly get score <3 . In the short-term memory domain worth 3 points obtained 6 out of 10 elderly cannot answer the question at all with a score of 0, while 4 other elderly only get a score that is 2. In the language domain the value is 3.9 of 10 elderly get a score that is ≥ 2 , while only one elderly person gets a score that is 1. On the verbal domain it is worth 6 points whether the results are 7 out of 10 elderly get a score of ≥ 4 , while 3 other elderly get a score of ≤ 3 .

From the explanatory data, it can be concluded that the average elderly with dementia has impaired short-term memory domains in the MMSE questionnaire. After treatment of traditional games, there is an increase in scores in each domain, especially in the domain of short-term memory. From the post test data in the treatment group, 6 out of 10 elderly people can answer the short-term domain memory questions perfectly and get a score of 3, and 4 other seniors get a score of 2, which means there is a significant increase before and after treatment. Similar to the control group, the results of the pre-test depicted elderly people with dementia experiencing disruption in the short-term memory domain but after the post test results were different from those in the treatment group ie there was no score increase in MMSE in any domain and some even decreased in each domain.

Based on table 2, the value of dementia levels in the treatment group decreased after traditional intervention in drought and reactivated cognitive function in the elderly. Dam-daman game is one of the games that is quite popular among respondents in the past who can prevent senility and improve cognitive function in the elderly who stimulate kinesthetic and visual function in the elderly by remembering the strategy of the game performed in his era.

According to the Indonesian Ministry of Health in 1999 the criteria for cognitive decline include forgetfulness or memory not functioning properly because the elderly rarely carry out activities related to cognitive function or memory that can stimulate kinesthetic and visual functions (Gasquoine, 2011).

Research conducted by (Wang, 2007) proves that by remembering events / things in the past by playing can improve cognitive in the elderly with dementia at the age of 65 and above. According to Hess (2014) and Latif (2016), explain that remembering events in the past with play therapy is one effective approach to reduce the level of dementia. This therapy is used for the elderly who experience impaired cognitive function by stimulating kinesthetic and visual function in the elderly who give impulses to memory.

Traditional game is one way for the elderly to play to think of past game strategies so that they can stimulate the brain to improve or maintain cognition that can prey on visual and kinesthetic functions. The traditional dam-daman game is a game performed on a board or carton with a strategy to eat the opponent's fruit / pawn and keep the fruit / pawn itself so that it is not consumed by the opponent. This game stimulates kinesthetic function in the elderly. The relationship between kinesthetic function and cognitive function will occur in the brain through the limbic system namely the amygdala and hippocampus. The brain will get stimulation to remember strategies / past events that will be captured by efferent nerve fibers and continued by afferent nerve fibers to the central nervous system. The process will be integrated in the reticular formation which functions to focus attention so that movement occurs through muscle spindle muscle contraction so that kinesthetic functions work.

Traditional games of daman also stimulate the visual function of the elderly. Visual function originating from the retina stimulates the optic nerve with regard to pawn movements. The prefrontal lobe receives stimulation from the optic nerve to work and think by planning strategies to be used in play that have been

done in the past. The existence of thoughtful thinking activities of the past stimulates cognitive functions to reactivate which can slow the decline in cognitive function and prevent an increase in dementia in the elderly.

The process of kinesthetic and visual functions is included in the cognator and regulator subsystems in Roy's adaptation theory. Roy's adaptation theory explains that the relationship between input, the process of subsystem cognator and regulator and output must be balanced so they will produce an adaptive response to the individual.

Dementia is a symptom experienced by the elderly so that the elderly cannot respond adaptively which can affect every aspect of the life of the elderly, physiological, psychological, social, and spiritual problems. Calista Roy's Adaptation Theory explains the importance of responding in an adaptive manner to maintaining the integrity of the body from a healthy range of physical and mental illnesses from the state of the surrounding environment. Adaptive response can work well if the regulator and cognator components included in the subsystem of Roy's adaptation model process well through appropriate inputs. The appropriate input in this study is to intervene in traditional damages to improve cognitive function, mood, and

behavior in elderly dementia so that the elderly can respond adaptively.

Based on table 2, H1 results were received, that is, there was the influence of traditional damages on the decline in the level of dementia in the elderly. There was a difference in the level of dementia in the treatment group at the pretest and posttest through the Paired t-test statistical test and the Independent t-test statistical test showed that the intervention of traditional games of drought provided by researchers was effective in reducing the level of dementia in the elderly.

From the discussion, the role of nurses in research on dementia in the elderly is that nurses are able to carry out the nursing process from the process of assessment, diagnosis, planning, implementation, to evaluation. The assessment process occurs when nurses in this case the researchers conduct an assessment of the initial data on the elderly, namely asking about the characteristics and lifestyle of the elderly. The assessment process was completed and the results were obtained that the elderly had dementia and a nursing diagnosis appeared, namely nutritional imbalance less than need, memory impairment, barriers to social interaction, verbal communication barriers, ineffective coping according to NANDA 2015. The next action taken by the researcher is to

run the process planning and implementation. Plan and implement appropriate measures to reduce the level of dementia so that nursing diagnoses that appear can be overcome. Then evaluate the results starting from assessment to implementation.

CONCLUSION

Conclusions are based on the results of the study of the influence of traditional damages on the decline in dementia in the elderly in Kediri Regency.

1. Dementia is influenced by age, sex, type of work, and level of education. The role of nurses is needed in the settlement of the risk factors for dementia by conducting a study of the characteristics of the respondent and then a nursing diagnosis appears so that the nurse can carry out interventions that can be carried out in accordance with the diagnosis obtained.

2. Based on the discussion in the previous chapter the level of dementia in the elderly before given the intervention of traditional games of damsia still did not show a difference or vice versa.

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