



## ORIGINALS

### Comparing Nursing Interventions for cognitive function in hypertensive elderly: art and reminiscence

Comparación de Intervenciones de Enfermería para la función cognitiva en ancianos hipertensos: arte y reminiscencia

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#### ABSTRACT:

**Introduction:** Hypertensive elderly have a vulnerability to decreased cognitive function. This study aims to determine the difference between reminiscence therapy and art drawing therapy on cognitive function of hypertensive elderly.

**Methods:** This study used a quantitative quasi experiment approach, with a static group comparison design, pre-test and post-test group. There were two sample groups in this study, reminiscence therapy and art drawing therapy (32 people per each group). The Mini Mental Status Examination (MMSE) instrument used to measure cognitive function. The Wilcoxon and Mann-Whitney tests were used for data processing as all data were not normally distributed.

**Results:** The results of this study point to the fact that there is a significant difference in the cognitive function of hypertensive elderly before (20; 16-27) and after (21; 20-30) the art drawing therapy intervention (p-value = 0,001). There is a significant difference in the cognitive function of the hypertensive elderly before (20; 16-27) and after (26; 20-30) administering the reminiscence therapy intervention (p-value = 0,001). However, there was no significant difference in cognitive function between the Artistic Drawing and Reminiscence Therapy groups (p-value = 0,056).

**Conclusion:** The results of this study can be used as a reference in providing nursing care for elderly hypertension in improving cognitive function with art drawing and reminiscence therapy.

**Keywords:** Aged; Art Therapy; Cognition; Hypertension.

## RESUMEN:

**Introducción:** Los ancianos hipertensos tienen vulnerabilidad a la disminución de la función cognitiva. Este estudio pretende determinar la diferencia entre la terapia reminiscente y la terapia de dibujo artístico sobre la función cognitiva de los ancianos hipertensos.

**Métodos:** En este estudio se utilizó un enfoque cuantitativo cuasiexperimental, con un diseño estático de comparación de grupos, un grupo pre-test y un grupo post-test. Hubo dos grupos de muestra en este estudio, terapia de reminiscencia y terapia de dibujo artístico (32 personas por cada grupo). Se utilizó el instrumento Mini Mental Status Examination (MMSE) para medir la función cognitiva. Para el procesamiento de los datos se utilizaron las pruebas de Wilcoxon y Mann-Whitney, ya que todos los datos no presentaban una distribución normal.

**Resultados:** Los resultados de este estudio apuntan a que existe una diferencia significativa en la función cognitiva de los ancianos hipertensos antes (20; 16-27) y después (21; 20-30) de la intervención de terapia de dibujo artístico (valor de  $p = 0,001$ ). Existe una diferencia significativa en la función cognitiva de los ancianos hipertensos antes (20; 16-27) y después (26; 20-30) de administrar la intervención de terapia de reminiscencia (valor de  $p = 0,001$ ). Sin embargo, no hubo diferencias significativas en la función cognitiva entre los grupos de Dibujo Artístico y Terapia de Reminiscencia (valor  $p = 0,056$ ).

**Conclusión:** Los resultados de este estudio pueden utilizarse como referencia en la prestación de cuidados de enfermería a ancianos hipertensos para mejorar la función cognitiva con dibujo artístico y terapia de reminiscencia.

**Palabras clave:** Anciano; Arteterapia; Cognición; Hipertensión.

## INTRODUCTION

The elderly undergo a physiological aging process that causes several progressive changes in the physiology of various organ systems of the body, one of which is the cognitive system <sup>(1)</sup>. The changes that occur with increasing age are brain volume decreases and neuron death, which have implications for memory storage capacity <sup>(2)</sup>. This condition occurs in almost all elderly individuals; however, its progression is greater in elderly individuals with hypertension.

Hypertensive elderly individuals have the potential to experience complications from damage to cognitive function, including dementia. Previous studies have reported that the incidence of dementia is significantly correlated with a persistent increase in systolic blood pressure  $\geq 160$  mmHg in the elderly <sup>(3)</sup>. Another study claimed that hypertensive elderly people have the potential to experience a 1.09-fold increase in cognitive function impairment for every 10% increase in blood pressure <sup>(4)</sup>. This is because prolonged hypertension affects the cerebral blood flow and metabolism. This condition causes hypoperfusion and degenerative loss of cognitive function <sup>(5)</sup>.

Dementia and other cognitive disorders require proper treatment because they have a negative impact on health in the elderly <sup>(6)</sup>. Deterioration of cognitive function affects the elderly in a comprehensive way, leading to feelings of hopelessness and helplessness, frustration with the environment, and high levels of dependency <sup>(7)</sup>. In fact, decreased cognitive function is correlated with lower quality of life in women <sup>(8)</sup>. Therefore, it is important to make efforts to prevent this complication. Thus, there is an urgent need to identify alternative solutions to prevent cognitive dysfunction.

The treatment of elderly patients with cognitive function problems can be carried out pharmacologically, that is, by administering drugs, and non-pharmacologically, by including interventions included in Cognitive Rehabilitation Therapy (CRT). One type of cognitive rehabilitation therapy is art-therapy <sup>(9)</sup>. Art-therapy includes various activities, one of which is drawing or painting and coloring the resulting images

according to one's thoughts <sup>(10)</sup>. Providing this therapy can be an option because it is practical, easy to perform, and does not harm the patient <sup>(11)</sup>. In addition, art-therapy in the form of art-drawing therapy also has several benefits, such as improving visuovascular function and stimulating the front part of the brain through drawing and coloring, so that the therapy can help improve memory in patients with memory loss.

Another type of intervention with the potential to improve cognitive function in the elderly is reminiscence therapy. This therapy aims to help patients recall past events, pleasant thoughts, and feelings. In addition to affecting cognitive function, this therapy is useful in reducing levels of depression, low self-esteem, disability, hopelessness, and social isolation in the elderly <sup>(12)</sup>. This therapy provides impulses to memory to influence the regulation of motor activity and the processing of cognitive functions <sup>(13)</sup>.

These two types of interventions have never been compared with regard to cognitive function in the elderly population. This became the idea of the research team to find out "What is the difference between reminiscence therapy and art-drawing therapy on cognitive function in hypertensive elderly?" This study aimed to analyze the role of reminiscence therapy and art-drawing therapy on cognitive function in elderly patients with hypertension.

## **MATERIAL AND METHOD**

### **Study Design**

This study used a quantitative approach with a quasi-experimental design, with static group comparison, pretest, and posttest group design.

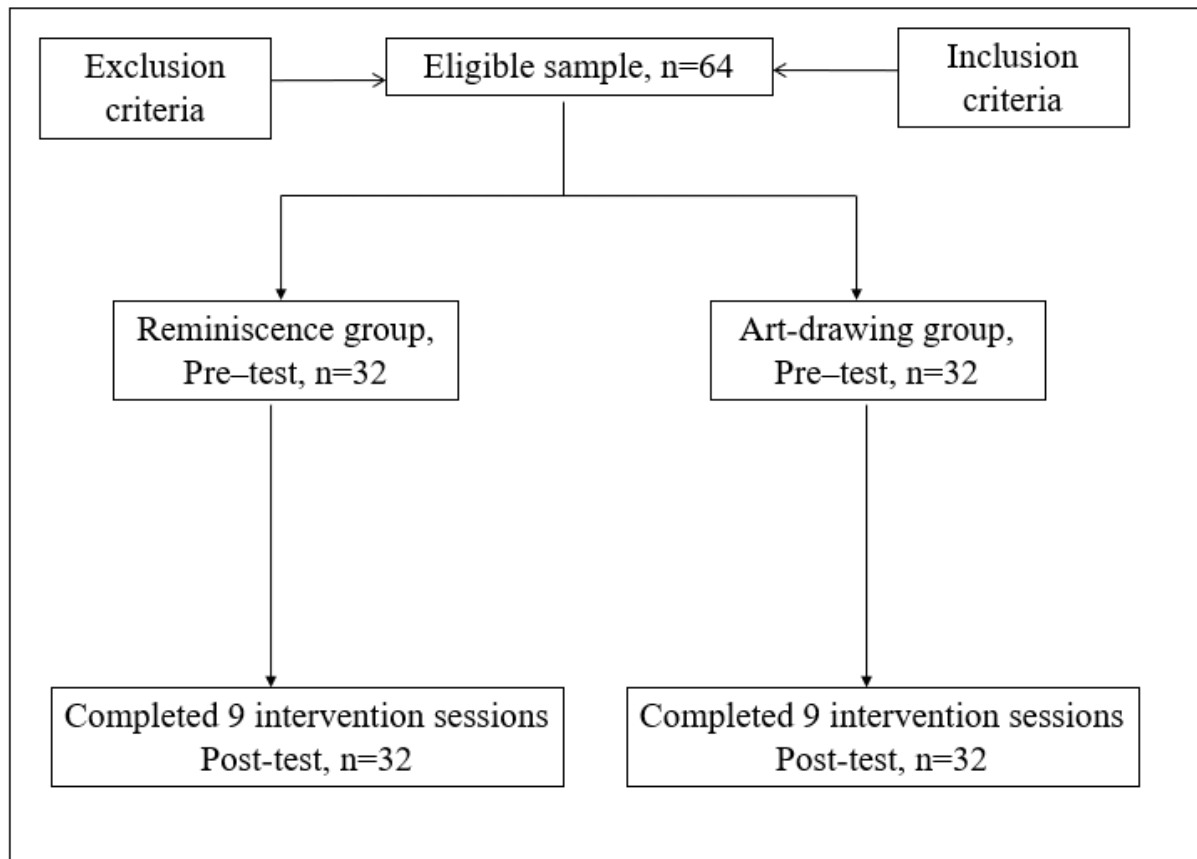
### **Participants and Setting**

The data for this study were obtained from the working area of the Kerambitan II Community Health Center, Bali province, from April 8 to May 30, 2024. The study population included all elderly people who experienced hypertension in the Tabanan Regency in 2024. Sampling Purposive sampling was used in this study.

The inclusion criteria were elderly people who were recorded in the report as elderly people diagnosed with hypertension and receiving standard antihypertensive medication at the health center and elderly people who could communicate in Balinese and/or Indonesian. Meanwhile, the exclusion criteria in this study were hypertensive elderly with chronic confusion, mental disorders, and an inability to participate in group activities.

The sample size in this study was determined using the formula of the average approach for two unpaired populations, with a result of 29 for each group. Subsequently, sample shortages due to dropouts were anticipated by increasing the estimated sample size. There were 32 participants in the art-drawing therapy group and 32 in the reminiscence therapy group. A respondent flowchart is shown in Figure 1.

**Figure 1:** Respondent Flowchart. Own elaboration



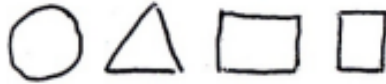
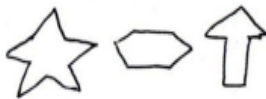


## Data Collection

Data were collected using the Mini Mental Status Examination (MMSE). This instrument was developed by Folstein et al. in 1975. To assess the mental and cognitive status of older adults <sup>(14)</sup>. The MMSE instrument has been tested and shown to be valid and reliable in Indonesia for assessing cognitive function with a reliability value of 0,887 and a validity value of 0,776, which is higher than the p-value = 0,001 <sup>(15)</sup>. The items of this instrument consisted of orientation, memory, attention, and verbal and written skills. Both groups had pre- and post-intervention data collected using this instrument. The MMSE score categories are definite cognitive impairment (if score is < 17), probable cognitive impairment (if score is between 17-23) and normal (if score is 24-30) <sup>(16)</sup>.

## Procedure

The reminiscence therapy intervention was carried out in nine sessions, with a duration of 60 min per session <sup>(12)</sup>. Art-drawing therapy also took place in nine meetings, each lasting 30 min <sup>(17)</sup>. The justification for this difference in duration was based on the results of previous studies that have demonstrated its efficacy. In addition, reminiscence therapy takes longer because the elderly must evoke memories of the past. However, in the case of art-drawing therapy, the elderly only had to follow the existing instructions of the research team without the need to recall something that happened in the past. Therefore, there was a difference in the duration of the interventions. Below is a table explaining the activities of each intervention:

**Table 1.** Description of Activities in Each Intervention

<b>Session Reminiscence Therapy</b>		<b>Art-Drawing therapy</b>
1	Introduction to the research team, senior health cadres and seniors.	Introduction and explanation: introduce the researcher himself/herself, explain the purpose of the activity and the procedures of the activity.
2	A reminiscence of the past through old songs from 1920-1960	Participants are asked to draw the following example, color it and then cut out the image according to its shape. 
3	Sharing photos	Participants are asked to draw the following example, color it and then cut out the image according to its shape. 
4	Discuss daily work/home activities or past charity work.	Participants are asked to draw the following example, color it and then cut out the image according to its shape. 
5	Remember unforgettable vacation times.	Participants are asked to draw the following example, color it and then cut out the image according to its shape. 
6	It reminds you of school days.	Participants are asked to draw freely according to what they think and color the drawing.
7	Reminiscent of children's toys.	Participants are asked to draw freely according to what they think and color the drawing.
8	Remembering the first date/couple/wedding party/married life.	Participants are asked to draw freely according to what they think and color the drawing.
9	Reminders about family/pets.	In this session, the facilitator leads the discussion and asks the respondent to recount the results of his or her work in the previous three sessions to the other participants.

## Data Analysis

No single respondent in either group dropped out. The data obtained on cognitive function variables were numerical data. Data analysis was performed using SPSS version 21. A homogeneity test was performed to ensure that the characteristics of the two groups were equivalent, as tested using Levene's test. There were no differences

in gender, age, or educational level between the reminiscence therapy and art-drawing groups.

The univariate test on respondent characteristics consisted of the variables of age, sex, and educational level. The data on the respondents' characteristics in numerical form are presented as medians, interquartile ranges, and standard deviations. Categorical data were presented as frequencies and percentages. The normality test of the data was performed as a condition for the bivariate test by using the t-test. All variables were tested using the Shapiro-Wilk test with results  $<0,05$ . This indicates that the data were not normally distributed; therefore, the Wilcoxon test was used for paired data and the Mann-Whitney test for unpaired data. The significance level ( $\alpha$ ) was set to 5%. Cognitive function data are presented as median (interquartile range).

## Ethical Considerations

This research obtained information that passed the ethical review of the Bina Usada Bali Health Sciences Institute of Health Research Ethics Commission (letter number 082/EA/KEPK-BUB-2024). We ensured that respondents were not in physical or psychological danger during the intervention. We also provide explanations and flexibility for potential respondents to decide on their participation in this research process.

## RESULTS

Table II shows the mean, standard deviation and interquartile range between groups. For the variable age are relatively equal.

**Table II.** Respondents' Characteristics According to Age (n=64)

Elements	Mean $\pm$ SD	95% CI
<b>Age</b>		
<b>Art-Drawing Therapy Group</b>	70 $\pm$ 5,483	60;81
<b>Reminiscence Therapy Group</b>	67,63 $\pm$ 5,493	60;81

Apart from that, it shows that the frequencies and percentages of the gender and educational level variables in the two groups were also relatively equal. Older women dominated both groups. The educational level of the art-drawing therapy group was dominated by junior high school and above. The reminiscence therapy group was dominated by those with a college level of education (Table III). Thus, overall the two groups were relatively homogeneous.

**Table III.** Respondents' Characteristics According to Gender And Educational Level (n=64)

Elements	Frequency	Percentage
<b>Gender</b>		
<b>Art-Drawing Therapy Group</b>		
Male	10	31,2
Female	22	68,8
<b>Reminiscence Therapy Group</b>		
Male	13	40,6
Female	19	59,4



Elements	Frequency	Percentage
<b>Educational Level</b>		
<b>Art-Drawing Therapy Group</b>		
Elementary	4	12,5
High School	11	35,2
Senior High School	11	35,2
Colleague	6	17,1
<b>Reminiscence Therapy Group</b>		
Elementary	3	9,4
High School	6	18,7
Senior High School	10	31,3
Colleague	13	40,6

Table IV shows a significant difference in cognitive function in the art-drawing therapy group before and after the intervention ( $p$  value = 0,001). There was an increase in the mean value of cognitive function before and after receiving art-drawing therapy. In addition, there was a significant difference in cognitive function between the reminiscence therapy group before and after the intervention ( $p$  value = 0,001). There was an increase in the mean value of cognitive function before and after reminiscence therapy.

**Table IV.** Differences in Cognitive Function In The Art-Drawing and Reminiscence Therapy Group Before and After Performing The Intervention (n = 64)

Variable	Group		Median (Interquartile range)	$p$ value*
<b>Cognitive Function</b>	Art-Drawing Therapy	Pre	20 (16-27)	0,001
		Post	21 (20-30)	
	Reminiscence Therapy	Pre	20 (16-27)	0,001
		Post	26 (20-30)	

\* Wilcoxon test was used

Table V shows that there were no significant differences between the cognitive function of the hypertensive elderly in the art-drawing therapy group and the reminiscence therapy group ( $p$  value 0,056). However, the mean value obtained in the reminiscence therapy group was higher than that in the art-drawing therapy group.

**Table V.** Differences in Cognitive Function Between The Art-Drawing Group and Reminiscence Therapy Before and After Performing The Intervention (n = 64)

Variable	Group	Median (Interquartile range)	Z	$p$ value*
<b>Cognitive Function</b>	Art Drawing Therapy	3,0 (0-9)	-1.910	0,056
	Reminiscence Therapy	4,5 (0-9)		

\*Mann-Whitney test was used

## DISCUSSION

The results of the univariate test showed that the mean age of the art-drawing therapy group and the reminiscence therapy group were not very different, that is, in the older

age ranges. Previous research has indicated that the incidence of vascular dementia is more severe in individuals aged 65–64 years with hypertension <sup>(18)</sup>. In addition, the majority of the respondents in this study were women. This is in line with the results of a previous study that reported that hypertensive older women had lower MMSE scores than hypertensive older men <sup>(19)</sup>. Most of the educational levels of the respondents in this study were in the medium-to-high education range. Previous research affirms that educational level is a factor that is significantly related to the incidence of dementia in older people <sup>(20)</sup>. Thus, older age, female sex, and educational level were correlated with impaired cognitive function.

The results of bivariate tests in the art-drawing therapy group showed a significant difference in the cognitive function of the hypertensive elderly before and after the intervention. These results are in line with those of several studies linking art-drawing to cognitive function in the elderly. A study conducted in Singapore found that elderly people who received art-drawing in the form of physical creation of artwork and cognitive evaluation of paintings showed a significant increase in cognitive function <sup>(21)</sup>. Beyond that, research in Tanzania claims that providing a visual arts therapy intervention can optimize cognitive function and last up to six months <sup>(22)</sup>. Studies in China also affirmed that expressive art-therapy can significantly improve cognitive function and mental state of the elderly <sup>(23)</sup>. Art-therapy interventions can influence cognitive function through three mechanisms: physiological, cognitive, and social stimulation. Under physiological stimulation, art-therapy affects episodic memory, executive function, abstract thinking, and working memory. In cognitive stimulation, drawing activates fine motor skills, coordination, visuospatial memory, abstract thinking, and executive functions, whereas sharing the story in a plenary related to their artwork stimulates language skills and self-expression, memory, abstract thinking, executive control, and satisfaction. and self-confidence. Finally, in social stimulation, art-drawing therapy allows seniors to interact with other participants, discuss the images they create, and provide feedback. This has the potential to reduce stress and loneliness as well as improve social interaction and mood <sup>(24)</sup>.

Bivariate results in the reminiscence therapy group showed that there was a significant difference in the cognitive function of the hypertensive elderly before and after the intervention. These results are in line with previous research that claimed that reminiscence therapy had a significant effect on cognitive function in elderly individuals with Alzheimer's disease and vascular dementia <sup>(25)</sup>. Other studies have also revealed that reminiscence therapy administered in groups or individually is significantly effective in improving cognitive function in older people with Alzheimer's <sup>(26)</sup>. The reminiscence intervention was also tested using different methods in older people with dementia, namely conventional methods and virtual reality. These two methods showed the same results, that is, a significant increase in cognitive function <sup>(27)</sup>. Reminiscence therapy can influence cognitive function by bringing back pleasant memories of the past, recalling deep and impressive memories, increasing social interaction because it is done in groups, and improving communication skills because they are encouraged to explain in detail <sup>(28)</sup>.

The comparison results obtained in this study showed that there were no significant differences in cognitive function between the reminiscence therapy and art-drawing therapy groups. However, from the perspective of the difference in mean ranks, the reminiscence therapy group showed higher MMSE scores after the intervention. This is due to the longer duration of reminiscence therapy than art-drawing therapy. In



addition, reminiscence therapy overlaps with one of the elements of MMSE assessment, namely memory. The difference is that the memory that is trained in reminiscence therapy is long-term memory, whereas the memory assessed in the MMSE is short-term memory.

These two interventions increased MMSE scores in the hypertensive elderly. These results are in line with previous research on elderly people with dementia in Taiwan that compared art and reminiscence therapy interventions. There was a significant difference in agitation symptoms in the art-therapy group, but not in the reminiscence therapy group <sup>(29)</sup>. The reminiscence therapy group achieved a higher mean score than the art-drawing therapy group. Reminiscence therapy is more effective in improving cognitive function in the elderly because it stimulates pleasant memory. The process of recounting memories encourages older people to search for different words to stimulate more optimal cognitive functions <sup>(30)</sup>.

A limitation of this research is that it has not carried out in-depth interviews about the experiences of each group after participating in the intervention. This finding could be the basis for intervention preferences to improve cognitive function in older individuals with hypertension.

## **CONCLUSIONS**

The results of this study indicated significant differences in the cognitive function of the hypertensive elderly in the art-drawing therapy and reminiscence therapy groups. In addition, there were no significant differences in cognitive function between the art-drawing therapy and reminiscence therapy groups. The mean value of cognitive function in the reminiscence therapy group was higher than that of the art-drawing therapy group. No previous study has specifically compared these two interventions in older adults with hypertension. The results of this study can be used as a basis for providing relevant nursing interventions for older people with impaired cognitive function. Future research could also explore and develop research methods using mixed methods to obtain more comprehensive results. In addition to exploring variations in the delivery methods of each intervention, and examine the long-term effects of delivering both interventions.

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