



## **BALL FISHING GAME ACTIVITY AS A MEDIUM FOR MILD DEMENTIA THERAPY IN THE ELD**

**Herni Sulastien<sup>1\*</sup>, Siti Zuraida Muhsinin<sup>1</sup>, Baiq Amalia Sholiha<sup>1</sup>, Baiq Susanti<sup>2</sup>**

<sup>1</sup>Faculty of Health Sciences, Universitas Nahdlatul Wathan Mataram, Jl. Kaktus No.1-3, Gomong, Mataram, Nusa Tenggara Barat 83126, Indonesia

<sup>2</sup>Puskesmas Gunung Sari Lombok Barat, Jl. Pariwisata No.70, Gunungsari, Lombok Barat, Nusa Tenggara Barat 83351, Indonesia

\*[hernisulastien@gmail.com](mailto:hernisulastien@gmail.com)

### **ABSTRACT**

The elderly represents the final stage in the human life process, characterized by various physical, cognitive, and functional limitations that arise due to the degenerative process. According to statistical data from 2022, the proportion of the elderly population increased from 7.57% in 2021 to 10.48% in 2022. One of the most prevalent conditions among the elderly is dementia, which manifests as a progressive decline in memory, cognitive abilities, and the capacity to perform daily activities. Without intervention, dementia symptoms worsen over time, necessitating targeted therapeutic approaches to prevent its progression. Engaging in recreational activities, such as playing games, has been shown to keep the mind active and foster cognitive engagement. This is particularly important for the elderly, especially those at risk of or experiencing mild dementia. The "Ball Fishing Game" is a simple yet engaging activity that involves the use of locally crafted wooden tools, woven bowls, and plastic balls. This game aims to stimulate cognitive functions, enhance memory, and improve concentration in 11 elderly individuals. The objective of this study was to evaluate the effectiveness of the Ball Fishing Game as a therapeutic medium for managing mild dementia in the elderly. A quasi-experimental research design was used, utilizing a one-group pretest-posttest approach to assess the effect (impact) of the intervention. Statistical analysis using a correlation test yielded a significance (sig.) value of 0.021 (<0.05), indicating a significant effect of the Ball Fishing Game on reducing Mini-Mental State Examination (MMSE) scores in elderly individuals with mild dementia. Furthermore, a paired sample t-test yielded a sig. (2-tailed) value of 0.005 (<0.05), indicating a significant difference between pretest and posttest MMSE scores following the intervention. In conclusion, the Ball Fishing Game is an effective therapeutic medium for managing mild dementia in elderly individuals.

Keywords: ball fishing game; dementia; elderly

### **How to cite (in APA style)**

Sulastien, H., Muhsinin, S. Z., Sholiha, B. A., & Susanti, B. (2024). Ball Fishing Game Activity as a Medium for Mild Dementia Therapy in the Eld. *Indonesian Journal of Global Health Research*, 6(6), 4271-4276. <https://doi.org/10.37287/ijghr.v6i6.5194>.

## **INTRODUCTION**

The elderly, referred to as Manula or Lansia in Bahasa Indonesia, represents the final stage in the human life process and is considered a natural part of the life cycle. According to Law No. 13 of 1998, the elderly are defined as individuals aged 60 years or older. Additionally, the World Health Organization (WHO) defines the elderly as a group undergoing the aging process, characterized by gradual physiological changes that impact their overall health and functionality (World Health Organization, 2008). Aging involves a progressive decline in the body's ability to repair tissues and maintain normal physiological functions. This decline reduces the body's resistance to infections and its ability to recover from damage (Maulidina, 2016). According to data from the Central Statistics Agency (Badan Pusat Statistik or BPS), the proportion of the elderly population in Indonesia reached 11.75% in 2023, marking an increase of 1.27% from the previous year. In the province of West Nusa Tenggara (NTB), the

percentage of elderly individuals in 2023 was recorded at 10.20% (Central Bureau of Statistics, 2021).

With increasing age, the health conditions of the elderly deteriorate, often accompanied by a rise in functional impairments and disabilities (Yohanes Reynaldi Lumowa, 2023). Data indicate that mild disabilities, measured by the ability to perform daily activities, affect approximately 51% of individuals aged 55–64 years and 62% of those aged 65 years and older. One of the primary conditions contributing to increased disability among the elderly is dementia (World Health Organization, 2008). Dementia is a degenerative disease that cannot be treated using conventional methods for physical degenerative diseases, such as surgery or direct physical interventions. This is because dementia primarily affects the nervous system (Yogi Udjajaa, Reinert Yosua Rumagita, Wikaria Gazalia, 2021). The disease progresses gradually, often beginning with mild depressive symptoms, followed by mild cognitive decline, such as forgetfulness. In Indonesia, the prevalence of dementia is rising and resembles an iceberg phenomenon, where a large portion of cases remains undiagnosed or unaddressed. Currently, more than 4.2 million Indonesians are estimated to be living with dementia (Bestari, 2023). Several factors contribute to the development of dementia, including age, gender, genetic predisposition, a family history of the disease, Down syndrome, hypertension, low levels of folic acid, insufficient family support, and unhealthy lifestyle choices (Nugroho, 2015)

One effective approach to preventing or reducing the risk of dementia is by stimulating the brain (Yogi Udjajaa, Reinert Yosua Rumagita, Wikaria Gazalia, 2021). According to systematic reviews by Demurtas (2020) and Ita (2022), approximately 3% of dementia cases could be prevented by increasing levels of physical activity. Enhanced physical activity slows the pathological progression of dementia (Demurtas et al., 2020). Physical activities, such as playing games, have been shown to positively affect cognitive health (Ita et al., 2022). Several games specifically target various aspects of dementia and are designed to address the cognitive and functional challenges associated with the condition (McCallum & Boletsis, 2013). To implement this approach, researchers have developed a game that stimulates the brain through the Ball Fishing activity. Based on an initial survey conducted at Puskesmas Gunung Sari (Gunung Sari Community Health Center), there are 3,521 elderly individuals in the center's coverage area. While the Elderly Family Posyandu program is conducted monthly within the Puskesmas work area, no game-based activities have been implemented as part of this program. The objective of this study was to evaluate the effectiveness of the Ball Fishing Game as a therapeutic medium for managing mild dementia in the elderly.

## **METHOD**

This study was conducted in the Puskesmas Gunung Sari work area from March to November 2024. A quasi-experimental method with a one-group pretest-posttest design was used to evaluate the effectiveness of the Ball Fishing game activity as an intervention for elderly individuals with mild dementia (Polit & Beck, 2008). This design does not include a comparison group; however, it involves an initial observation (pre-test), which allows researchers to assess changes following the intervention. The study population consisted of all elderly individuals with dementia residing in the Puskesmas Gunung Sari work area, managed by the Elderly Family Posyandu. Participants were selected using the Mini-Mental State Examination (MMSE) based on the following inclusion criteria: Aged 60–85 years, Cooperative, Literate (able to read and write), Not experiencing decreased consciousness, Free of significant hearing or vision impairments, and MMSE scores <23 (Monroe & Carter, 2012).

The Ball Fishing game intervention was administered to elderly participants with mild dementia across 12 sessions, each lasting 25–30 minutes. The sample size was determined using the Lameshow formula (1990) (Nursalam, 2016). The result of the sample size calculation was increased by 10% to account for potential dropouts, resulting in a total sample size of 11 elderly participants. The sampling technique used was consecutive sampling, with participants selected based on predefined inclusion and exclusion criteria. The research instrument utilized in this study was the Mini-Mental State Examination (MMSE). The MMSE consists of 11 question items, with researchers assigning scores for each item. The assessment typically takes 10–15 minutes to complete. The MMSE was used to identify elderly individuals with mild dementia, defined as those with a score of <23 (Monroe & Carter, 2012). The MMSE has a maximum score of 30 and is a reliable tool for detecting cognitive impairments, establishing baseline cognitive function, and monitoring cognitive decline over time.

The implementation of this study began with visits to the Elderly Family Posyandu within the Puskesmas Gunung Sari work area to discuss and determine the most suitable time to conduct the activities. Once the schedule was finalized, the researchers gathered the elderly participants and established a mutual agreement regarding the timing and commitment required for participation. Then, a pre-test assessment using the Mini-Mental State Examination (MMSE) was conducted. Additionally, researchers collected general demographic data on the elderly participants. Following this, the intervention involving the Ball Fishing game activity was carried out. The intervention lasted for six weeks, with a frequency of two sessions per week, each lasting 25–30 minutes. During the intervention, the researchers acted as a facilitator, supported by additional facilitators to ensure the smooth running of the sessions. Upon completion of the intervention, the MMSE was administered again as a post-test. Data processing included general demographic data and the results of the pre-test and post-test assessments. Descriptive statistical methods were used, including frequency distribution, mean, median, and standard deviation. To analyze the effect of the Ball Fishing game activity on mild dementia in the elderly, a paired t-test was conducted. A significance level of  $p < 0.05$  was set, where the null hypothesis ( $H_0$ ) would be rejected. Statistical analysis was performed using SPSS version 26.6 for Windows.

## RESULT

Table 1.

The Effect of Ball Fishing Game Activity as a Medium for Mild Dementia Therapy in the Elderly

The Effect of Ball Fishing Game Activity as a Medium for Mild Dementia Therapy in the Elderly	Groups	p Value
	Intervention (n=11)	
Pretest Mean	21.00	
Posttest Mean	21.90	0,005
Comparison		
Pretest vs posttest*	p = 0.021	
% down (mean)		

Based on the data in Table 1, the correlation test yielded a significance (sig.) value of 0.021, which is less than 0.05. This indicates a significant effect of the Ball Fishing game activity on reducing MMSE scores in elderly individuals with mild dementia. Furthermore, the paired t-test yielded a sig. (2-tailed) value of 0.005, also less than 0.05. This indicates a statistically significant difference between the pre-test and post-test MMSE scores of elderly participants who underwent the Ball Fishing game activity intervention.

## **DISCUSSION**

According to Health Direct, a Mini-Mental State Examination (MMSE) score below 20 may indicate cognitive impairment (Australia, 2024). In this study, participants were elderly individuals aged 60–75 years. At this stage of life, the elderly typically experience a decline in health, including memory deterioration. This aligns with a study conducted by Wijaya and Simon, which suggests that elderly individuals in nursing homes with mild dementia represent a small proportion of cases. Furthermore, the study emphasizes that advancing age does not necessarily mean a worsening of dementia symptoms. Maintaining a healthy lifestyle and continuously exercising cognitive functions can help ensure that dementia remains mild, even in individuals over 80 years old (Eryani et al., 2022; McCallum & Boletsis, 2013).

A literature review by McCallum & Boletsis (2013) highlights that games designed for the elderly can help combat dementia. These games serve various purposes, including prevention, rehabilitation, and education, which are tailored to meet the specific needs of elderly individuals. Moreover, a study conducted by Craig et al., (2023) showed significant improvements in dementia-related knowledge after playing such games. Increases in pre-test to post-test scores were observed across seven categories of dementia knowledge: life impact, risk factors, symptoms, treatment, assessment, caregiving, and disease trajectories. The largest improvements were noted in understanding dementia trajectories and risk factors, with all comparisons showing statistical significance at  $p < 0.001$ .

## **CONCLUSION**

Therapy using Ball Fishing game activity is an effective medium for treating mild dementia in the elderly.

## **ACKNOWLEDGEMENTS**

We extend our deepest gratitude to the Ministry of Education, Culture, Research, and Technology for providing funding support for this study through the Non-Legal Entity Higher Education Institutions program for the 2024 Fiscal Year. This work was made possible under decree number 1297/D4/AL.04/2024 and contract number 3192LL/8/AL04/2024.

## **REFERENCES**

- Australia, H. (2024). Mini-Mental State Examination (MMSE). <https://www.healthdirect.gov.au/mini-mental-state-examination-mmse>
- Central Bureau of Statistics. (2021). Elderly Population Statistics 2021. <https://www.bps.go.id/id/publication/2021/12/21/c3fd9f27372f6ddcf7462006/statistik-penduduk-lanjut-usia-2021.html>
- Bestari, AP (2023). Getting to Know Dementia. Ministry of Health of the Republic of Indonesia. [https://yankes.kemkes.go.id/view\\_artikel/2819/mengenai-dementia-alzheimer](https://yankes.kemkes.go.id/view_artikel/2819/mengenai-dementia-alzheimer)
- Craig, S., Stark, P., Wilson, C.B., Carter, G., Clarke, S., & Mitchell, G. (2023). Evaluation of a dementia awareness game for undergraduate nursing students in Northern Ireland: a Pre-/Post-Test study. *BMC Nursing*, 22(1), 1–8. <https://doi.org/10.1186/s12912-023-01345-2>
- Demurtas, J., Schoene, D., Torbahn, G., Marengoni, A., Grande, G., Zou, L., Petrovic, M., Maggi, S., Cesari, M., Lamb, S., Soysal, P., Kemmler, W., Sieber, C., Mueller, C., Shenkin, S.D., Schwingshackl, L., Smith, L., & Veronese, N. (2020). Physical Activity and Exercise in Mild Cognitive Impairment and Dementia: An Umbrella Review of Intervention and Observational Studies. *Journal of the American Medical Directors Association*, 21(10), 1415-1422.e6. <https://doi.org/10.1016/j.jamda.2020.08.031>

- Eryani, IGAP, Jayantari, MW, & Wijaya, IKM (2022). Sensitivity Analysis in Parameter Calibration of the WEAP Model for Integrated Water Resources Management in Unda Watershed. *Civil Engineering and Architecture*, 10(2), 455–469. <https://doi.org/10.13189/cea.2022.100206>
- Ita, D., Gauthier, E., & Bih, L. (2022). NA systematic review and meta-analysis of randomized controlled trials on the effect of serious games on people with dementia Title. *Aging Research Reviews*, Volume 82. <https://doi.org/https://doi.org/10.1016/j.arr.2022.101740>
- Maulidina, H. (2016). Regulation of the Minister of Health of the Republic of Indonesia (Patent No. 25). [http://hukor.kemkes.go.id/uploads/produk\\_hukum/PMK\\_No.\\_25\\_ttg\\_Rencana\\_Aksi\\_Nasional\\_Kesehatan\\_Lanjut\\_Usia\\_Tahun\\_2016-2019\\_.pdf](http://hukor.kemkes.go.id/uploads/produk_hukum/PMK_No._25_ttg_Rencana_Aksi_Nasional_Kesehatan_Lanjut_Usia_Tahun_2016-2019_.pdf)
- McCallum, S., & Boletsis, C. (2013). Dementia games: A literature review of dementia-related serious games. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 8101 LNCS, 15–27. [https://doi.org/10.1007/978-3-642-40790-1\\_2](https://doi.org/10.1007/978-3-642-40790-1_2)
- Monroe, T., & Carter, M. (2012). Using the Folstein Mini Mental State Exam (MMSE) to explore methodological issues in cognitive aging research. *European Journal of Aging*, 9(3), 265–274. <https://doi.org/10.1007/s10433-012-0234-8>
- Nugroho. (2015). *Gerontic Nursing*. EGC.
- Nursalam. (2016). *Concept and Application of Nursing Science Research Methodology*. Salemba Medika.
- Polit, D.F., & Beck, C.T. (2008). *Nursing Research*. In Lipincott Williams & Wilkins (Vol. 6). <https://doi.org/10.1017/CBO9781107415324.004>
- World Health Organization. (2008). *Aging*. [https://www.who.int/health-topics/ageing#tab=tab\\_1](https://www.who.int/health-topics/ageing#tab=tab_1)
- Yogi Udjajaa, Reinert Yosua Rumagita, Wikaria Gazalia, JD (2021). Healthy Elder: Brain Stimulation Game for the Elderly to Reduce the Risk of Dementia. <https://www.sciencedirect.com/science/article/pii/S1877050920324546>
- Yohames Reynaldi Lumowa, RE (2023). The Influence of Advanced Age on Elderly Health. *Journal of Nursing*, 16(1), 363–372. <http://journal2.stikeskendal.ac.id/index.php/keperawatan/article/view/1474/1008>

