SOUTH EAST ASIA NURSING RESEARCH
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Research article

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Enhancing Memory in Elderly Individuals Through Tahajud Worship in Brebes Regency, Indonesia

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Article Info

Article History:
Submitted: July 15th 2024
Accepted: Sept 26th 2024
Published: Sept 29th 2024

Keywords:
elderly; tahajud prayers; memory

Abstract

In the elderly, as age increases, there will of course be a decline in organs and body functions, which can disrupt daily activities. This can be caused by the aging process, one of which is characterized by a decline in cognitive function. One of the declines in cognitive function in the elderly is memory loss. Memory decline can be prevented with spiritual activities, one of which is the midnight prayer. This study aims to analyze the relationship between the frequency of midnight prayers and memory in the elderly in the Brebes Regency. This research method is quantitative, analytical, and observational, using a cross-sectional design. The research subjects were elderly people in RT 002/RW 004 Dukuhturi Village, Bumiayu District, Brebes Regency. The total sample that met the inclusion criteria was 35 respondents. The research was carried out in February 2024. The measuring instruments used were the Tahajud prayer questionnaire and the digit span questionnaire. The analytical test used in this research is the chi-square test. The results of the chi-square test showed a p-value of 0.004 (< 0.05), which means that there is a relationship between the frequency of midnight prayers and memory in the elderly in the Brebes Regency. The results of the analysis concluded that there was a significant relationship between the frequency of midnight prayers and memory in the elderly in the Brebes Regency.

INTRODUCTION

The global demographic landscape is undergoing a significant transformation characterized by a rapidly increasing elderly population. According to the World Health Organization (WHO), an individual aged 60 years and above is classified as elderly, a group that is expanding at an unprecedented rate worldwide. Indonesia, as part of this global trend, has witnessed a substantial rise in its aging population, currently exceeding 7% of the total population and projected to continue growing sharply in the coming years. Specifically, in Central Java province and Brebes Regency, the elderly population has shown a consistent upward trajectory, with data from the Central Statistics Agency (BPS) indicating an increase from 10.79% in 2016 to 12.45% in 2020 of the total population in Brebes. This demographic shift underscores the urgency of addressing health challenges associated with aging, particularly those affecting cognitive health and quality of life.[1]

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South East Asia Nursing Research, Vol 6 No 3, Noov 2024
ISSN:2685-032X
DOI: https://doi.org/10.26714/seanr.6.3.2024.133-141

Cognitive decline, especially memory impairment, is a common and debilitating consequence of the aging process that significantly disrupts daily functioning and independence among the elderly. Memory deterioration manifests as difficulty in recalling recent events, diminished interest in new information, and impaired cognitive processing, which collectively indicate underlying neurodegenerative changes primarily affecting the hippocampus and frontal brain regions. Such cognitive deficits not only reduce the quality of life but also increase the burden on healthcare systems and caregivers. Therefore, identifying effective preventive strategies to mitigate cognitive decline is critical. Current evidence suggests that cognitive deterioration in the elderly can be attenuated through interventions that stimulate brain function and promote neuroplasticity.[2]

Spiritual activities, particularly the practice of Tahajud prayer a voluntary night prayer performed after midnight have emerged as potential non-pharmacological interventions to preserve cognitive function in the elderly. Engaging in Tahajud prayer involves physical movements such as prostration, which enhances cerebral blood flow and oxygenation, and cognitive engagement through memorization and recitation of prayers, which exercises working memory and attention. These physiological and neuropsychological mechanisms may contribute to slowing cognitive decline and improving memory retention. Moreover, hormonal regulation during Tahajud prayer, including the modulation of stress-related hormones like cortisol and the enhancement of brain wave patterns associated with relaxation and memory consolidation, further supports its beneficial role. Given these promising attributes, investigating the relationship between Tahajud prayer frequency and memory function in the elderly is both timely and necessary to inform holistic approaches to healthy aging.[3,4,5]

METHODS

Study Design and Subjects

This study employed an observational analytical quantitative design with a cross-sectional approach to examine the relationship between the frequency of Tahajud prayer and memory performance among elderly individuals. The cross-sectional design was chosen to capture data at a single point in time, allowing for the assessment of associations between variables within the target population. The research was conducted in February 2024 in RT 002/RW 004 Dukuhturi Village, Bumiayu District, Brebes Regency, Central Java, Indonesia.

The study population consisted of elderly residents aged 60 years and above living in the specified village area. Inclusion criteria required participants to be permanent residents of RT 002/RW 004, aged 60 years or older, capable of communicating effectively, and willing to participate by providing informed consent. Individuals with diagnosed severe cognitive impairments, neurological disorders, or physical disabilities that could interfere with the ability to perform Tahajud prayer or complete memory assessments were excluded to ensure data validity.

A total of 35 respondents who met the inclusion criteria were recruited using a consecutive sampling technique, whereby all eligible individuals encountered during the data collection period were invited to participate until the sample size was fulfilled. This sample size was determined based on the population size and feasibility considerations within the study setting. The demographic characteristics of the participants, including age and gender distribution, were documented to contextualize the findings. The study's design and subject selection aimed to provide a representative snapshot of the elderly population in the community to explore the potential association between

spiritual practice frequency and cognitive function.

Instruments and Data Collection

The primary instruments utilized in this study comprised a structured questionnaire designed to assess the frequency of Tahajud prayer and a standardized cognitive test to evaluate memory function. The Tahajud prayer frequency questionnaire was developed to quantify how often participants engaged in this voluntary night prayer, categorizing frequency levels to distinguish between regular and less frequent practitioners. This instrument was carefully constructed to ensure clarity and cultural relevance, facilitating accurate self-reporting by elderly respondents.

Memory assessment was conducted using the digit span test, a widely recognized neuropsychological tool that measures short-term memory capacity and working memory. The test includes two components: digit span forward and digit span backward. In the digit span forward task, participants are required to recall a sequence of numbers in the order presented, assessing immediate memory span. The digit span backward task demands recalling the numbers in reverse order, which evaluates working memory and executive function. Both components are integral parts of the Wechsler Adult Intelligence Scale (WAIS) and have been validated for use in elderly populations to detect subtle cognitive changes.

Data collection was carried out through face-to-face interviews and direct administration of the digit span test by trained researchers in the participants' homes within RT 002/RW 004 Dukuhturi Village. The consecutive sampling technique was employed, whereby all eligible elderly individuals encountered during the data collection period in February 2024 were invited to participate until the target sample size was reached. This approach ensured inclusivity and minimized selection bias. The researchers provided clear instructions and assistance during questionnaire completion and memory testing to accommodate potential sensory or cognitive limitations among the elderly.

The data collection process was conducted with sensitivity to the participants' comfort and privacy, ensuring that responses were confidential and voluntary. The timing of data collection was scheduled to avoid interference with participants' daily routines and religious practices, thereby enhancing cooperation and data reliability. Overall, the combination of a culturally appropriate questionnaire and a validated cognitive test, alongside rigorous data collection procedures, provided a robust framework for accurately assessing the relationship between Tahajud prayer frequency and memory function in the elderly population studied.

Ethical Considerations

This study was conducted in strict accordance with ethical standards for research involving human subjects. Prior to data collection, ethical approval was obtained from the Health Research Ethics Committee of the Faculty of Medicine, Muhammadiyah University of Semarang, under registration number 010/EC/KEPK-FK/UNIMUS/2024. The approval process ensured that the study design, procedures, and instruments complied with established ethical guidelines to protect the rights, dignity, and welfare of the participants.

Informed consent was obtained from all respondents after providing comprehensive information about the study's purpose, procedures, potential risks, and benefits. Participants were assured that their participation was voluntary and that they could withdraw at any time without any consequences. Confidentiality and anonymity of the respondents were strictly maintained throughout the research process by assigning unique codes to data

and securely storing all collected information.

Furthermore, the study adhered to principles of beneficence and non-maleficence by minimizing any potential discomfort or harm during data collection, particularly considering the elderly population's vulnerability. The researchers ensured respectful communication and accommodated participants' needs to facilitate a comfortable and ethical research environment. These ethical considerations underpin the integrity and credibility of the study's findings.

RESULTS

Demographic and Descriptive Data

The study involved 35 elderly participants residing in RT 002/RW 004 Dukuhturi Village, Bumiayu District, Brebes Regency. The age distribution of respondents showed that the majority were classified as elderly (60–74 years), comprising 27 individuals (77.1%). Middle-aged participants (45–59 years) and older elderly (75–90 years) each accounted for 4 respondents (11.4%) respectively. Regarding gender, female participants predominated with 26 individuals (74.3%), while males accounted for 9 respondents (25.7%).

In terms of Tahajud prayer frequency, 32 respondents (91.4%) reported performing the prayer regularly, whereas 3 respondents (8.6%) indicated less frequent practice. Memory assessment using the digit span test revealed that 27 participants (77.1%) had good memory performance, 5 (14.3%) had average memory, 1 (2.9%) had poor memory, and 2 (5.7%) were classified as having very poor memory.

The detailed frequency distribution of respondent characteristics is presented in Table 1 below, illustrating the demographic composition, Tahajud prayer frequency, and memory status of the study population. These descriptive data provide a foundational understanding of the sample profile and the prevalence of the variables under investigation.

Table 1
Descriptive data

Indicators	f	(%)
Age		
Middle age (45–59)	4	11.4
Elderly (60–74)	27	77.1
Old (75–90)	4	11.4
Gender		
Male	9	25.7
Female	26	74.3
Tahajud Prayer		
Good (Regular)	32	91.4
Less frequent	3	8.6
Memory Status		
Good	27	77.1
Average	5	14.3
Bad	1	2.9
Very bad	2	5.7
Total	35	100

These findings indicate a predominance of elderly female participants who regularly perform Tahajud prayer and exhibit good memory function. The distribution suggests potential demographic patterns relevant to the study's focus on the relationship between spiritual practice and cognitive health in the elderly population.

Statistical Analysis and Findings

The association between the frequency of Tahajud prayer and memory status among the elderly was analyzed using the Pearson Chi-Square test. The results demonstrated a statistically significant relationship, with a p-value of 0.004, indicating that the frequency of performing Tahajud prayer is positively associated with memory performance in the elderly population of Brebes Regency. Specifically, elderly individuals who regularly performed Tahajud prayer exhibited better memory function compared to those who prayed less frequently.

Table 2 presents the detailed cross-tabulation of Tahajud prayer frequency against memory categories. Among the 32 respondents who regularly performed Tahajud prayer, 27 (77.1%) had good memory, 3 (8.6%) had average memory, 1 (2.9%) had bad memory, and 1 (2.9%) had very bad memory. Conversely, among the 3 respondents with less frequent Tahajud prayer practice, none had good memory, 2 (5.7%) had average memory, none had bad memory, and 1 (2.9%) had very bad memory. This distribution underscores a clear trend where higher frequency of Tahajud prayer correlates with superior memory outcomes.

The significant p-value (<0.05) confirms that the observed association is unlikely due to chance, suggesting that regular engagement in Tahajud prayer may contribute to maintaining or enhancing memory function in elderly individuals. This finding aligns with the hypothesis that spiritual practices involving physical and cognitive components can positively influence cognitive health. The results provide empirical support for the potential role of Tahajud prayer as a non-pharmacological intervention to mitigate memory decline in aging populations.

Table 2
The Relationship Between Tahajud Prayer Frequency and Memory

Tahajud	*Memory*								*P Value*
	Good		Mid		Bad		Very bad		
	f	%	f	%	f	%	f	%	
Good	27	77.1	3	8.6	1	2.9	1	2.9	0.004
Less frequent	0	0	2	5.7	0	0	1	2.9	
Total	27	77.1	5	14.3	1	2.9	2	5.8	

DISCUSSION

This study revealed a significant positive association between the frequency of Tahajud prayer and memory performance among elderly individuals in Brebes Regency. The data demonstrated that elderly participants who regularly performed Tahajud prayer exhibited notably better memory function compared to those with less frequent practice, as evidenced by the statistically significant chi-square test result (p = 0.004). The majority of respondents were women, who also tended to engage more frequently in Tahajud prayer, and most participants fell within the 60–74 years age group. These demographic trends suggest that gender and age may influence both the practice of Tahajud prayer and cognitive outcomes in this population.

The predominance of female participants aligns with previous observations that women often have higher participation rates in spiritual and religious activities, including Tahajud prayer. This may be influenced by sociocultural factors and physiological changes such as menopause, which can affect sleep patterns and nocturnal awakenings, potentially facilitating engagement in night prayers. The age distribution, with most respondents being in the early elderly bracket, is consistent with the period when cognitive decline begins to manifest but may still be modifiable through lifestyle interventions.

The findings support the hypothesis that spiritual practices involving physical movement, cognitive engagement, and psychological relaxation can contribute to preserving cognitive functions, particularly memory, in the elderly. The act of performing Tahajud prayer requires memorization and recitation of verses, which exercises working memory and attention. Additionally, the physical postures involved, such as prostration, may

enhance cerebral blood flow and oxygenation, further supporting brain health. These mechanisms collectively may explain the observed relationship between frequent Tahajud prayer and better memory performance in this study population. This evidence underscores the potential value of integrating spiritual activities into holistic approaches for cognitive health maintenance in aging individuals.[1,2]

The findings of this study align with and extend previous research highlighting the beneficial effects of spiritual practices, particularly Tahajud prayer, on cognitive function and memory preservation in the elderly. Prior studies have demonstrated that the physical movements involved in prayer, especially prostration, facilitate increased cerebral blood flow and oxygen delivery to the brain, which are critical for maintaining neuronal health and cognitive performance. The position of the heart above the head during prostration enhances venous return and arterial perfusion, thereby optimizing oxygen and nutrient supply to brain tissues, including the hippocampus and frontal cortex—regions essential for memory processing and executive function.[5,11] This physiological mechanism supports the observed association between frequent Tahajud prayer and improved memory outcomes in the elderly participants of this study.

Moreover, the cognitive demands of Tahajud prayer, which involve memorizing and reciting verses, engage multiple memory systems including short-term, working, and long-term memory. This continuous mental exercise may promote neuroplasticity and strengthen synaptic connections, thereby mitigating age-related cognitive decline.2,6. The digit span test used in this study, which assesses short-term and working memory, reflects these cognitive domains actively stimulated during prayer. The positive correlation between prayer frequency and digit span performance suggests that regular engagement in such spiritual activities may serve as a form of cognitive training, enhancing memory retention and recall abilities.

Hormonal regulation during Tahajud prayer also provides a plausible scientific explanation for its cognitive benefits. The nocturnal timing of Tahajud coincides with circadian rhythms that favor the secretion of hormones such as adrenocorticotropic hormone (ACTH), which modulates cortisol levels. Reduced cortisol secretion during this period is associated with decreased stress and improved hippocampal function, facilitating better memory consolidation and retrieval.[12] Additionally, Tahajud prayer has been linked to the restoration of neurotransmitters like serotonin and nonadrenaline, which play vital roles in mood regulation, stress reduction, and cognitive processes including attention and memory.[11] These neuroendocrine effects contribute to an optimal internal environment for cognitive preservation in the elderly.

Furthermore, brain wave modulation during Tahajud prayer, particularly the enhancement of theta waves, has been implicated in stress reduction and memory strengthening. Theta waves are associated with deep relaxation, meditation, and memory encoding, suggesting that the meditative aspects of Tahajud prayer may facilitate cognitive resilience by reducing oxidative stress and promoting neural repair mechanisms.[11] This neurophysiological perspective complements the physical and hormonal mechanisms, providing a comprehensive understanding of how Tahajud prayer may slow cognitive decline.

The gender differences observed in this study, with females more frequently performing Tahajud prayer and exhibiting better memory, can also be contextualized within physiological and sociocultural frameworks. Menopausal hormonal changes in women, including decreased

estrogen levels, affect sleep quality and nocturnal awakenings, potentially increasing opportunities for night prayers.[10] This increased engagement in Tahajud prayer among women may partly explain their superior memory performance, as regular spiritual practice confers cognitive benefits. Additionally, sociocultural factors often encourage greater religious participation among women, reinforcing these physiological effects.

In summary, the convergence of enhanced cerebral oxygenation through prostration, cognitive stimulation via memorization and recitation, hormonal modulation reducing stress and supporting hippocampal function, and brain wave patterns conducive to memory consolidation collectively underpin the significant relationship between Tahajud prayer frequency and memory preservation in the elderly. These multifaceted mechanisms are supported by a growing body of scientific literature, validating the integration of spiritual practices like Tahajud prayer into holistic strategies for promoting cognitive health and mitigating age-related memory decline.[2,5,6,11,12]

The findings of this study have important implications for elderly care and cognitive health promotion, particularly in communities where spiritual practices such as Tahajud prayer are culturally significant. The demonstrated positive association between frequent Tahajud prayer and better memory performance suggests that incorporating spiritual activities into health interventions could serve as a valuable, non-pharmacological approach to mitigating cognitive decline in aging populations. This aligns with a holistic model of elderly care that recognizes the interplay between physical, cognitive, emotional, and spiritual well-being. Encouraging regular engagement in Tahajud prayer or similar spiritual practices may enhance cognitive resilience by combining physical movement, mental exercise, and stress reduction, thereby supporting brain health and quality of life in the elderly.

Gender differences observed in this study, with women more frequently performing Tahajud prayer and exhibiting better memory outcomes, highlight the need to consider physiological and sociocultural factors in designing cognitive health programs. Menopause-related hormonal changes in women, such as decreased estrogen levels, can disrupt sleep patterns and increase nocturnal awakenings, which may facilitate participation in night prayers like Tahajud. These physiological changes, coupled with sociocultural tendencies for higher religious engagement among women, may contribute to their greater involvement in spiritual activities and associated cognitive benefits. Understanding these gender-specific dynamics is crucial for tailoring interventions that effectively promote cognitive health across diverse elderly populations.

Moreover, the broader context of these findings emphasizes the potential of spiritual practices to serve as accessible, culturally congruent strategies for cognitive health maintenance. The physical postures involved in Tahajud prayer, such as prostration, enhance cerebral blood flow and oxygen delivery, which are vital for neuronal function and memory preservation. Concurrently, the cognitive demands of memorizing and reciting prayers stimulate working memory and executive functions, while the meditative aspects reduce stress and modulate neuroendocrine responses, including cortisol regulation. Together, these mechanisms create a neurophysiological environment conducive to slowing cognitive decline. Integrating such spiritual activities into community health programs could therefore offer a sustainable and meaningful avenue to support aging individuals, particularly in regions where religious practices are deeply embedded in

daily life. This approach not only fosters cognitive well-being but also strengthens social and emotional support networks, further enhancing overall health outcomes in the elderly.

CONCLUSION

There is a significant relationship between the frequency of Tahajud prayer and memory performance in the elderly population of Brebes District. The statistical analysis demonstrated that higher frequency of performing Tahajud prayer is associated with better memory function, as indicated by a p-value of 0.004. This finding underscores the potential role of regular Tahajud prayer as a beneficial spiritual activity that may contribute to the preservation of cognitive abilities, particularly memory, among elderly individuals.

ACKNOWLEDGMENT

We would like to express our sincere gratitude to all the elderly participants from RT 002/RW 004 Dukuhturi Village, Bumiayu District, Brebes Regency, who generously contributed their time and cooperation to this study. Our appreciation also extends to the local community leaders and health workers who facilitated the data collection process and provided invaluable support throughout the research. Furthermore, we acknowledge the Faculty of Medicine, Muhammadiyah University of Semarang, for their institutional support and for granting ethical approval, which was essential for the successful completion of this study.

This research was conducted with the aim of advancing knowledge on the role of spiritual practices in cognitive health among the elderly, and we are grateful to all individuals and institutions that made this possible. We also thank the research team members for their dedication and meticulous efforts in data collection, analysis, and manuscript preparation.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest related to this study. All procedures and reporting were conducted with full transparency and adherence to ethical standards, ensuring the integrity and impartiality of the research findings.

BIBLIOGRAPHY

1. Manafe LA, Berhimpon I. Hubungan Tingkat Depresi Lansia Dengan Interaksi Sosial Lansia Di BPSLUT Senja Cerah Manado. J Ilm Hosp. 2023 Nov 16;11(1):749–58.
2. Yusuf AR. Pengantar Kajian Ilmu Kedokteran pada Ibadah Sholat: Perspektif neurosains, kedokteran pencegahan, kronobiologi kedokteran, dan psikoneuroimunologi. Muhammadiyah University Press; 396 p.
3. Silalahi SL, Hastono SP, Kridawati A. Hubungan Aktivitas Fisik dengan Fungsi Kognitif pada Lansia di Cita Sehat Yogyakarta Tahun 2016. J Bid Ilmu Kesehat. 2017 Jun 1;7(1):5.
4. Madani F. Hubungan Antara Kebiasaan Membaca Al-Qur'an Dengan Fungsi Kognitif Pada Lansia Di Posyandu Lansia Menur Padokan Lor Tirtonirmolo Kasihan Bantul Yogyakarta. 2017 Aug 26 [cited 2024 Jul 11]; Available from: https://repository.umy.ac.id/handle/123456789/15623
5. Mardan D. Al-Qur'an : Sebuah Pengantar Memahaminya Secara Utuh [Internet]. [cited 2024 Jul 11]. Available from: http://repositori.uin-alauddin.ac.id/1661/1/Prof.%20Mardan.pdf
6. 106 Keperawatan Kesehatan Komunitas Teori dan Praktik Dalam Keperawatan.pdf [Internet]. [cited 2024 Jul 15]. Available from: http://repo.upertis.ac.id/1083/1/106%20Keperawatan%20Kesehatan%20Komunitas%20Teori%20dan%20Praktik%20Dalam%20Keperawatan.pdf
7. Lea Fatra Nurlaily Kamalin 1733143031. Pengaruh Terapi Shalat Tahajud Dalam Menurunkan Stres Pada Remaja Di UPT Pelayanan Sosial Bina Remaja Blitar [Internet]. IAIN Tulungagung; 2018 [cited 2024 Jul 15]. Available from: http://repo.uinsatu.ac.id/9988/
8. Tazkiah M, Septadina IS, Zulissetiana EF, Nindela R, Wardiansah. Peningkatan Memori Jangka Pendek Dengan Menggunakan Pemeriksaan Forward Digit Span Setelah Rutin Membaca Al Quran. J Kedokt Dan Kesehat Publ

Ilm Fak Kedokt Univ Sriwij. 2023 Dec 9;10(1):53–60.

9. Hidayati N, Haryanto J, Makhfudli M. Memory Training Meningkatkan Memori Jangka Pendek Lansia [Internet]. 2014 [cited 2024 Jul 15]. Available from: https: //www.semanticscholar.org/paper/ Memory-Training-Meningkatkan-Memori-Jangka-Pendek-Hidayati-Haryanto/c286d052977ba7f5d524c88beaad85cdc1454a38
10. Sagita D. Salat Tahajud Dalam Menjaga Kesehatan Mental Anggota Komunitas Tahajud Berantai (Kutub). 2021;
11. Fatayati NU, Sa'diyah K. Efektivitas Penerapan Metode Shalat Tahajud terhadap Peningkatan Daya Ingat Santri Tahfidz Putri Tingkat I Al-Karimiyah. Kariman J Pendidik Keislam. 2023 Jun 30;11(1):47–58.
12. Matin NS. Tahajjud Therapy for Stress Coping: Psychoneuroimmunological Perspective. In Atlantis Press; 2018 [cited 2024 Jul 15]. p. 617–9. Available from: https://www.atlantis-press.com/proceedings/amca-18/25901852