



Empowering the Elderly to Create Gardens for Aromatherapy; Enhancing Healthy Life Expectancy



Ning Arti Wulandari¹, ^{CA}Wimar Anugrah Romadhon¹, Ratna Mildawati²

¹STIKes Patria Husada Blitar, Indonesia

²STIKes Ganesha Husada Kediri, Indonesia

^{CA}Correspondent Author

Article Information

History Article:

Received, 23/09/2024

Accepted, 25/09/2024

Published, 2/12/2024

Keywords:

Elderly, Physical activity, Sleep quality, Healthy life expectancy

Abstract

Life expectancy is one of the indicators of the success of health development, especially in the elderly population. One way to improve Healthy Life Expectancy is through Active Aging, which aims to transform previously inactive seniors into active individuals, with the goal of extending life expectancy in a healthy and quality manner. The partner in this community's dedication was Blitar PSTW in Tulungagung who had an old age problem, lack of physical activity, poor quality of sleep and lack of use of empty land. The aim of the beginner community service program was to empower potential elderly individuals to produce aromatic materials in the form of essential oils and scented candles, starting from planting the plants that provide the raw materials, all the way to the production of aromatic materials to enhance their physical activity. The results of the data analysis used the Wilcoxon signed-rank test showed $P=0.000$, thus it can be concluded that the used of aromatherapy at night and increased physical activity through gardening and the activities of making aromatherapy materials conducted by the elderly can improved sleep quality. This service has produced an innovative technology product in the form of Standard Operating Procedures (SOP) for the production of essential oils and aromatherapy candles, aromatherapy candles, essential oils, and therapy gardens. The outcomes achieved in healthy living skills include utilizing free time by engaging in activities for the elderly (16%) and improving the quality of sleep for the elderly (86%).

© 2024 Journal of Community Service for Health

✉ Correspondence Address:

STIKES Patria Husada Blitar – East Java, Indonesia

Email: ningarti83@gmail.com

DOI: <https://doi.org/10.26699/jcsh.v5i2.1149>

This is an Open Access article under the CC BY-SA license (<http://creativecommons.org/licenses/by/4.0/>)

E-ISSN: 2746-5195

INTRODUCTION

Life expectancy is one of the indicators of the success of health development, especially in the elderly. Life expectancy in Indonesia has increased to 71.5 years, but healthy life expectancy (Healthy Life Expectancy or HALE) stands at 62.8 years. This means that the population that is healthy and has a good quality of life is around the age range of 62-63 years out of 71-72 years. Thus, it can be concluded that for 8.7 years, they experience a poor quality of life. This gap needs to be narrowed by increasing the Healthy Life Expectancy rate through active aging, or transforming previously inactive elderly individuals into active ones, with the aim of extending life expectancy in a healthy and quality manner (Theresa et al. 2023). Elderly individuals can be said to have achieved a prosperous life when they possess a good quality of life. Roy's theory posits that humans are adaptive systems, viewed holistically (bio, psycho, social) as a unity that encompasses Inputs, Control, Feedback Processes, and Output. The control process is a Coping Mechanism manifested through ways of adapting to the environment. The elderly experience an aging process that impacts their biological, psychological, and social aspects; therefore, they must be able to adapt to their conditions. To prevent a decline in physical health, primary transformation efforts using Roy's theory as an innovative approach to Control involve utilizing land and empowering potential elderly individuals to independently produce aromatherapy. This is an application of the research conducted by our team on the use of aromatherapy to improve the sleep quality of the elderly. Two aspects that can enhance the health of the elderly are effective sleep for the recovery of bodily functions and physical activity to maintain optimal functional levels of the body, which can reduce morbidity rates among the elderly, thereby increasing Health Life Expectancy (Sagayadevan et al. 2017).

The Social Service Center for the Elderly in Blitar, located in Tulungagung, has become a partner for community service because there is still much potential that can be developed to realize prosperous elderly individuals, both in terms of facilities and the characteristics of its residents. The condition of the partner, based on statistical data of the elderly living in the Tresna Werdha Blitar - Tulungagung facility, shows that out of 79 elderly individuals, 14 of them have a poor quality of life due to degenerative diseases and disabilities. The

quality of life for the elderly living in the Tresna Werdha Blitar Tulungagung nursing home tends to be worse compared to those living with their families (Romadhon and Rahmawaty 2022). From January 2023 to January 2024, the number of residents in the special nursing home has increased by about 5%, with an average addition of 1-2 elderly individuals requiring care, resulting in a decrease in the Healthy Life Expectancy rate. Elderly individuals with poor quality of life will increase the demand for companionship and long-term care, thereby adding to the economic burden on the country. Factors that influence quality of life are sleep quality and physical activity (Aliabadi et al. 2017).

Based on the survey results, the activities regularly carried out by the elderly residents of the nursing home include exercising every morning, worshipping according to their respective religions, and spiritual guidance. Other activities, such as skills assistance for potential elderly individuals, are only carried out when there are visits from external parties, due to the limited number of social workers available to provide support. The elderly have a lot of free time every day, and they only use it to watch TV, sleep, or sit back and chat with friends in the same residence. Only about 5 out of 80 elderly people are willing to engage in activities like helping in the kitchen to prepare food and sweeping the courtyard of the home. Such conditions will worsen the health of the elderly. Supported by the results of interviews with 10 out of 18 still-potential elderly individuals, they complained of joint pain, especially at night, leading many to experience sleep disturbances. Based on the research results from 36 elderly individuals living in the Tresna Werdha Blitar nursing home, 30 of them experience insomnia (Sharifi et al. 2019). Insomnia is a condition that describes when someone has difficulty sleeping. Conditions such as trouble sleeping, sleep problems, frequently waking up at night, and waking up too early. Based on the research findings, there is a correlation between sleep quality and the quality of life in the elderly (Juwariyah 2015).

From the beginner community service program that empowers potential elderly individuals to produce aromatherapy materials, starting from planting plants as the basic ingredients for production to the actual production of aromatherapy materials, the aim is to enhance their physical

activity. The produced aromatherapy materials are utilized to improve their sleep quality. The benefits of this activity include reducing morbidity rates among the elderly and enhancing their quality of life, thereby increasing health life expectancy in nursing homes.

METHOD

The methods and five stages of implementing community service are as follows:

Socialization program activities

Method: The socialization and coordination activities were attended by all elderly individuals with good physical activity abilities, leaders, staff/care home officers, and vocational school students who were interning, using a lecture method. It continues with a health screening that includes blood pressure, physical activity ability using the PASE (Physical Activity Scale for the Elderly) questionnaire, and sleep quality measured by the Pittsburgh Sleep Quality Index. (PSQI). Training activities to enhance healthy lifestyle skills and utilize leisure time in old age to remain fit. Implementation: Utilizing vacant land for a "Therapy Garden".

Method: The facilitators prepare the soil, fertilizer, gardening tools, and seedlings of fragrant flowers. The volunteers collaborate with the nursing home staff to motivate the elderly who have good physical activity abilities, based on the results of the screening, to participate in this activity. The elderly are planting flower seeds together in the prepared land, monitored and assisted by volunteers working in collaboration with the care facility staff. Training on aromatherapy creation for the elderly and care home staff.

Method: The facilitators prepare the tools and materials for making essential oils and aromatherapy candles. The facilitators collaborate with the care home staff to gather elderly individuals with good cognitive abilities in the hall. The volunteers provide education on the benefits and usage of essential oils and aromatherapy candles that will be produced in this training, as well as motivate the elderly to increase physical activity by utilizing their free time to care for the flower garden that has been created, in order to stay fit through a lecture method. Then, the volunteers

conduct training on the production of essential oils and aromatherapy candles for the staff of the care facility and elderly individuals with good cognitive abilities using a demonstration method.

Application of Technology

Method: The essential oils produced during the training are utilized for aromatherapy and administered at night using an aromatherapy diffuser. In each house, there are 2 devices installed. The volunteer team provides training to the elderly, assigning one person from each residence the responsibility to use the equipment through a demonstration method. The utilization of the therapy garden is entrusted to the management of the care facility to continue motivating the elderly to take turns caring for the garden in order to enhance their activity. The activities that the elderly can engage in to maintain the garden include sweeping/cleaning the garden, watering the plants, picking flowers for aromatherapy, providing fertilizer, and trimming the stems that have already bloomed to encourage regrowth.

Accompaniment and Evaluation

Method: The accompaniment activities for the use of essential oils and aromatherapy candles were carried out directly by the service team in 4 residences inhabited by elderly individuals who are physically independent in meeting their daily needs, using a demonstration method until the elderly are able to use the tools independently. This was also conducted by staff in 1 residence inhabited by elderly individuals requiring total care. Evaluation was conducted on the third day after the use of the aromatherapy diffuser among elderly individuals with independent physical activity in fulfilling daily needs and good cognitive abilities. What is being evaluated is the ability of physical activity using the PASE (Physical Activity Scale for the Elderly) questionnaire, and sleep quality is measured with the Pittsburgh Sleep Quality Index. (PSQI).

Sustainability of the Program

Method: This program will be continued by the elderly, accompanied by care staff as a modality and occupational therapy program for the elderly to improve health life expectancy in the nursing home.

RESULTS

Table 1. Statistical Test of the Elderly Physical Activity Questionnaire

		N	Mean	Sum of Ranks
The Elderly Physical Activity	Negative Ranks	7	4.00	28.00
	Positive Ranks	0	0	0
Tiles		36		
Total		43		
Asymp. Sign (2-tailed)		0.008		

Based on the statistical test using the Wilcoxon Signed Ranks Test, the results showed a Negative Rank (Decrease in Numbers), meaning that out of 43 elderly individuals, 7 or about 16% experienced improvement in physical activity with

an average score of 4 and a total score of 28. The significance value obtained is 0.008 (< 0.05), which means that there is a difference/effect from the intervention that was carried out.

Table 2. Statistical Test of the Elderly Sleep Quality Questionnaire

		N	Mean	Sum of Ranks
The Elderly Sleep Quality	Negative Ranks	37	19.00	703.00
	Positive Ranks	0	0	0
Tiles		6		
Total		43		
Asymp. Sign (2-tailed)		0.000		

Based on the statistical test using the Wilcoxon Signed Ranks Test, the results showed a Negative Rank (Decrease in Numbers), meaning that out of 43 elderly individuals, 37 or about 86% experienced significant improvement in sleep, with an average score of 17 and a total score of 561. The significance value obtained is 0.000 (< 0.05), indicating that there is a difference/effect from the intervention conducted.

The results of the creation of vacant land for the "Therapy Park" and its utilization.

The following image shows the difference in vacant land before and after it was turned into a "Therapy Garden."



Figure 1. Before the therapy garden was created.



Figure 2. After being turned into a therapy garden.

From a land area of 21 x 14 m², which was previously unused and overgrown with grass, weeds, and used as a dumping ground for construction debris and leftover building materials, after this community service, the vacant land has been cleared and planted with several flowers that produce a fragrant scent and can be used as essential oil materials, including the plate flower, rose, jasmine, and arum dalu, designed according to the type of flower. The plate flower is planted as a fence, while arum dalu and jasmine are planted near the area with the odor from the elderly's urine. However, the LED lights have not been installed yet, so the elderly cannot enjoy the park at night.

According to [Figure 2](#), The plants appear to be growing well, even though it is currently the dry season. This proves that the elderly are diligent in

taking care of the garden. Some elderly people also mentioned that some blooming jasmine and roses were picked to be used as air fresheners in their rooms. Some elderly women also diligently sweep the garden every morning.

DISCUSSION

The lack of physical activity in the elderly is likely to decrease their quality of life. Factors that influence quality of life are sleep quality and physical activity ([Sagayadevan et al. 2017](#)). The decline in the quality of life for the elderly can reduce Healthy Life Expectancy. Engaging in sufficient physical activity is one of the many aspects categorized under senior fitness. Therefore, the service stimulates the elderly to utilize their free time by doing physical activities such as gardening and producing aromatherapy to increase the physical activity of the elderly in the orphanage. Sufficient physical activity can help strengthen the heart. A strong heart can pump more blood with just a little effort. This physical activity consists of daily tasks and sports activities. Potential elderly residents of the nursing home have a lot of free time each day, which is mostly spent watching TV, sleeping, or sitting leisurely and chatting with friends in their wing. The relaxed behavior characterized by higher calorie intake and less physical activity, along with the aging process in the elderly, is a risk factor for the occurrence of non-communicable diseases such as hypertension, heart disease, and diabetes mellitus, which can diminish their quality of life ([Hidayat 2017](#)). Therefore, we will invite the elderly to make use of their free time by engaging in physical activities according to their abilities, utilizing the vacant land behind the care facility to plant herbs as raw materials for making aromatherapy, while also teaching them how to produce aromatherapy that they can use for themselves.

Based on previous research, out of 36 elderly individuals living in the Tresna Werdha Blitar nursing home, 30 people experienced insomnia. Insomnia is a condition that describes when someone has difficulty sleeping. This condition can lead to difficulties in sleeping, sleep problems, frequently waking up at night, and waking up too early. The amount of sleep needed for the elderly is 6 hours each day ([Fawale et al. 2017](#)). The impact of insomnia results in feelings of fatigue during the day and difficulties in carrying out daily activities. Conditions like these will lower the quality of life for the elderly, which will impact the decline in

Healthy Life Expectancy. Based on the research conducted by our group in 2022 at the Tresna Werdha Blitar Nursing Home, it has been proven that the administration of lavender aromatherapy (*Lavandula angustifolia*) and Javanese gamelan music has an effect on the quality and quantity of sleep in elderly individuals with insomnia. This is supported by research findings that indicate the impact of lavender aromatherapy on the sleep quality of the elderly at the Tresna Werdha Blitar Nursing Home in Tulungagung ([Juwariyah 2015](#)). In addition to lavender, there are several plants that can be used for aromatherapy, including valerian (*Valeriana officinalis*), peppermint (*Mentha piperita* L.), rose (*Rosa damascena*), lemongrass (*Cymbopogon citratus*), chamomile (*Matricaria recutita*), jasmine (*Jasminum grandiflorum*), and rosemary (*Rosmarinus officinalis*), as all of these plants contain essential oils. Essential oils can provide a relaxing effect ([Pratiwi and Subarnas 2020](#)). The use of aromatherapy includes inhalation (aromatherapy candles and steam from essential oils), massage oils in the form of lotions, saunas, and aromatherapy baths in the form of soaps. Therefore, we will train seniors who are still capable of creating aromatherapy products from plants that contain essential oils and are easy to grow in the Tulungagung area, such as jasmine, roses, lavender, and lemongrass. The aromatherapy products produced will be utilized by the elderly residents of the nursing home to address their health issues. The form of aromatherapy products that we will teach will be tailored to the physical capabilities of the elderly and the safety of the products for them, considering that the elderly are vulnerable to diseases due to the aging process. We will teach potential seniors how to make aromatherapy products, including essential oils and aromatherapy candles. The administration of aromatherapy through inhalation is more effective, quick, comfortable, and safe. The inhalation method can utilize tools such as vaporizers, diffusers, and candles. The olfactory nerve is the only cranial nerve that is directly affected by external stimuli and projects to the cerebral cortex, thereby providing a strong sedative effect that stimulates the cilia receptors of the olfactory nerve located in the olfactory epithelium to transmit the aroma to the olfactory bulb via the olfactory nerve. The olfactory bulb is connected to the limbic system. The limbic system receives all information from the auditory system, visual system, and olfactory system. The

limbic system is an inner structure of the brain shaped like a ring, located beneath the cerebral cortex. The most important parts of the limbic system related to aroma are the amygdala and hippocampus. The amygdala is the center of emotions, and the hippocampus is associated with memory (including aromatherapy). Then, through the hypothalamus as a regulator, the aroma is brought into a small but significant part of the brain called the raphe nucleus. The effect of the stimulated raphe nucleus is the release of serotonin, which is a neurotransmitter that regulates the onset of sleep. In addition, the use of aromatherapy in the residence will provide a sense of comfort for the occupants. The fragrance produced by aromatherapy will minimize the odor of urine from elderly individuals experiencing incontinence.

Out of 66 elderly individuals who are still able to perform daily physical activities independently, 43 have good cognitive function. Therefore, the evaluation was conducted only on these 43 elderly individuals. Among the 43 with good cognitive function, only 25 were willing to participate in training for making essential oils and candles for aromatherapy. It has been conveyed by the staff of the care facility that the elderly who did not participate in the training lacked motivation and felt preoccupied with helping in the kitchen and cleaning the residence. In addition to the elderly, this training was also attended by 5 staff members from the care facility. The training was conducted using a demonstration method, making it easy for the participants to understand. Five staff members at the independent care facility made aromatherapy candles and essential oils, four elderly individuals were able to create essential oils with the assistance of the staff, and three elderly individuals managed to make aromatherapy candles independently, although one elderly person trembled while pouring the melted wax into the candle glass. In addition to providing training on candle making and essential oils for aromatherapy, the volunteers also educate about the importance of physical activity and the use of facilities provided by the volunteers to support physical activities for the elderly. In the training process, 3 elderly individuals were able to correctly mention the benefits of physical activity for their body fitness.

The results of the training in essential oils and aromatherapy are utilized to improve the sleep quality of the elderly, with the facilitators providing

guidance on how to use them. Essential oils are used to scent the rooms of the guesthouse through a diffuser, while candles are simply lit. Through one session of assistance, the elderly person still could not use the diffuser independently, so the caregiver requested help from an officer to accompany the elderly. After 3 days of using aromatherapy every night at the guesthouse, there has been an improvement in the sleep quality of the elderly. Based on the data analysis using the Wilcoxon signed-rank test, a P value of 0.000 was obtained, which means that the use of aromatherapy at night and the increase in physical activity through gardening and the activities of making aromatherapy materials carried out by the elderly can improve sleep quality.

The barren front yard of the guesthouse and the neglected empty land behind the shelter are not being used and appear unkempt, overgrown with grass, with some corners used for waste disposal. The Ecological Health Model uses an approach that views an individual's health comprehensively, influenced not only by physical, social, and psychological factors but also by the environment. One of the factors that affects the quality of life of the elderly is the condition of stress and depression among them. One of the causes of stress experienced by the elderly is the physical environment ([Pardede 2018](#)). Therefore, we will stimulate potential seniors to utilize vacant land to create a "Therapy Garden" with plants that can be used as materials for aromatherapy. The utilization of that vacant land can also be referred to as Green Open Space (RTH). RTH is an open area in nature filled with green gardens adorned with ornamental plants and shade-providing trees, which can offer a sense of coolness to visitors, thereby enhancing psychological comfort ([Fakhri Mashar 2021](#)). As we can see in image 1.2, the unused land of the garden already has lush trees, but underneath it remains untended, overgrown with weeds. That is the place we will use as a garden with plants that can be used for aromatherapy. In addition, the barren area in front of the nursing home, as shown in image 1.1 above, will be utilized for planting lavender, roses, and jasmine. Besides serving as a garden, these plants will produce a pleasant fragrance that will enhance the comfort of the elderly residents. This aligns with previous research recommendations to plant lavender in front of the nursing home, as lavender is known to easily emit a lovely aroma,

especially when watered ([Juwariyah 2015](#)). According to Florence Williams, Therapeutic Gardens are a form of environmental therapy where there is interaction between humans and nature that has a positive impact on health, as it effectively reduces stress, stimulates the senses, and triggers positive physical and emotional responses. Therapeutic gardens not only provide aesthetics or a calming atmosphere, but they can also respond to the intrinsic needs of humans in the pursuit of emotional and mental recovery through architecture based on natural elements in therapeutic gardens, such as green vegetation, the beauty of flowers, and the freshness of water elements in line with "nature restoration" ([Wahyudi, Yuwanto, and Rofik 2023](#)).

The implementation of technology and innovation, as well as the relevance to the needs of partners and their participation in this community service, is as follows:

- a. The Standard Operating Procedure (SOP) for making essential oils and aromatherapy candles can serve as a guideline for caregivers in conducting modality therapy for the elderly. This is highly relevant to the partners' program, which has led to great enthusiasm among the caregivers to participate in the training.
- b. Aromatherapy candles that can be used to improve sleep quality are highly relevant to the needs of the elderly, and they can make them on their own, although still with assistance.
- c. Essential oils that can be used for aromatherapy in the residence to reduce unpleasant odors while also enhancing sleep quality are very relevant to the needs of the elderly. The elderly can produce aromatherapy, although with assistance.
- d. Therapeutic gardens serve as a means for the elderly to enhance their physical activity, thereby slowing the aging process and increasing health life expectancy. The participation of the elderly in this case is taking care of and cleaning the garden, so that until now the garden is still well maintained.



Figure 3. Photo of physical activity planting plants for a therapy garden



Figure 4. Photo of the training on making Essential Oils and Aromatherapy Candles

The productivity of the aromatherapy materials in a week is only 2 liters with 2 types of floral scents, and that's still using flowers bought from the market because the flower production from the therapeutic garden is not yet sufficient for a single distillation. Meanwhile, the aromatherapy candle products are used in 3-5 activities at a time. This is due to the physical limitations of the elderly, especially in the process of distilling essential oils, which takes a considerable amount of time and can lead to fatigue for them.

This community service activity has already shown its value in improving the activities of the elderly, who usually spent their free time sleeping and just sitting around. Now, they are taking care of flowers, cleaning the garden every day, distilling flowers to make essential oils, and creating aromatherapy candles. With this activity, it is now rare to find elderly people sleeping in the morning, which can improve the quality of their sleep.

CONCLUSION

The physical activity of the elderly increased by 16% and the quality of sleep improved by 86% after this community service activity was conducted. The elderly are trained in creating and utilizing aromatherapy at night, and they experience an increase in physical activity due to gardening and the activities involved in making aromatherapy materials, which helps them improve their sleep quality.

SUGGESTION

The staff of the nursing home,

The staff can utilize the SOP for candle making and the SOP for essential oils as guidelines in providing occupational therapy and modalities for the elderly in accordance with the social services program.

The elderly residents of the nursing home,

Elderly individuals are encouraged to continue engaging in physical activities within their tolerance limits.

STIKes Patria Husada Blitar,

STIKes Patria Husada will continue this community service program by providing opportunities for nursing students to practice elderly care at PSTW Blitar in Tulungagung.

ACKNOWLEDGMENT

This research received a grant from the Ministry of Education and Culture and the authors would like to thank the Ministry of Education and Culture, Stikes Patria Husada and anyone involved in this research.

FUNDING

Providing financial support by the Ministry of Education and Culture.

CONFLICTS OF INTEREST

No internal conflicts were found in this activity.

REFERENCES

- Aliabadi, Samaneh, Mitra Moodi, Mohammad Reza Miri, and Zoya Tahergorabi. 2017. "Sleep Quality and Its Contributing Factors Among Elderly People : A Descriptive-Analytical Study." *Mod Care J* 14(1):1-7. <https://doi.org/10.5812/modernc.64493>
- Fakhri Mashar, Mohamad. 2021. "Fungsi Psikologis Ruang Terbuka Hijau." *Jurnal Syntax Admiration* 2(10):1930-43. <https://doi.org/10.46799/jsa.v2i10.332>
- Fawale, Michael B., Isiaka A. Ismaila, Adekunle F. Mustapha, and Olanrejawu Komolafe, Morenikeji A, Ibigbami. 2017. "Correlates of Sleep Quality and Sleep Duration in a Sample of Urban-Dwelling Elderly Nigerian Women." *Sleep Health* 3(4). <https://doi.org/10.1016/j.sleh.2017.05.008>
- Hidayat, Ardli. 2017. "HUBUNGAN AKTIVITAS FISIK DENGAN KUALITAS HIDUP LANSIA DI POSYANDU DESA SELOKERTO KECAMATAN SEMPOR KABUPATEN KEBUMEN." Universitas Muhammadiyah Gombong.
- Juwariyah, Titik. 2015. "Pengaruh Aromaterapi Lavender Terhadap Kualitas Tidur Dan Tekanan Darah Lansia Di Panti Sosial Tresna Wherda Tulungagung." *Jurnal Kesehatan Ibu Dan Anak* 1(1).
- Pardede, Jek Amidos. 2018. "Teori Dan Model Adaptasi Sister Calista Roy : Pendekatan Keperawatan." *Jurnal Ilmiah Kesehatan* (November 2018):18.
- Pratiwi, Fazrina, and Anas Subarnas. 2020. "Aromaterapi Sebagai Media Relaksasi." *Farmaka* 18(3):66-75.
- Romadhon, Wimar Anugrah, and RR Dewi Rahmawaty. 2022. "Pemberian Aroma Terapi Lavender (Lavandula Angustifolia) Dan Terapi Musik Langgam Jawa Terhadap Kualitas Dan Kuantitas Tidur Lansia Insomnia Berbasis Teori Adaptasi Roy." *Jurnal Keperawatan Muhammadiyah* 7(4). <https://doi.org/10.30651/jkm.v7i4.15445>
- Sagayadevan, Vathsala, Edimansyah Abdin, Saleha Binte Shafie, Anitha Jeyagurunathan, Rajeswari Sambasivam, Yunjue Zhang, Louisa Picco, Janhavi Vaingankar, Siow A. Chong, and Mythily Subramaniam. 2017. "Prevalence and Correlates of Sleep Problems among Elderly Singaporeans." *Psychogeriatrics* 17(1):43-51. <https://doi.org/10.1111/psyg.12190>
- Sharifi, Somayeh, Zeinab Heidari, Saba Bromand, Nilofar Binayi, and Mahrokh Keshvari. 2019. "The Relationship between Sleep Quality and Quality of Life of Retired Elderly." *Elderly Health Journal* 5(2):79-83. <https://doi.org/10.18502/ehj.v5i2.2153>
- Theresa, Ria Maria Theresa, Marlina Dewiastuti, Melly Kristanti, and Cantika. 2023. "Determinants of Active Aging Affect Healthy Life Expectation." *Jurnal Profesi Medika : Jurnal Kedokteran Dan Kesehatan* 17(1):44-49. <https://doi.org/10.33533/jpm.v17i1.5837>
- Wahyudi, Ahyar, Listyo Yuwanto, and Abdul Rofik. 2023. "Holistic Approach for Cancer Patients : Integration of Therapeutic Gardens and Person Centered Care (Literature Review) Pendekatan Holistik Bagi Pasien Kanker : Integrasi Taman Terapeutik Dan Person Centered Care (Tinjauan Literatur)." 2(10):2671-2704. <https://doi.org/10.55927/fjst.v2i10.6434>