



Community-Based Health Education and Personal Hygiene Knowledge Among Hypertensive Older Adults: A Gerontologic Nursing Perspective

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ABSTRACT

Hypertension is a major global health problem with increasing prevalence among older adults and requires comprehensive management beyond pharmacological treatment. From a gerontic nursing perspective, strengthening self-care, including personal hygiene, is essential to prevent complications and improve health outcomes. However, age-related cognitive and sensory changes often reduce the effectiveness of conventional health education. This study aimed to evaluate the effectiveness of a community-based educational video in improving personal hygiene knowledge among older adults with hypertension. A quantitative pre-experimental study using a one-group pretest–posttest design was conducted among 38 adults aged ≥60 years recruited through purposive sampling at a public health center in Samarinda, East Kalimantan, Indonesia. Knowledge was assessed using a validated and reliable structured questionnaire before and after participants viewed a seven-minute educational video developed according to gerontic nursing principles. Data were analyzed using descriptive statistics and the Wilcoxon Signed Rank Test. Personal hygiene knowledge improved significantly following the intervention. Before the intervention, most participants had good or moderate knowledge, whereas after the intervention all participants achieved a good level of knowledge, with a statistically significant improvement ($p < 0.001$). These findings demonstrate that community-based educational videos are an effective, practical, and age-appropriate strategy for improving personal hygiene knowledge among older adults with hypertension and support their integration into promotive and preventive gerontic nursing services in primary health care and community settings.

Keywords: Hypertension, Older Adults, Personal Hygiene, Video-Based Health Education, Gerontic Nursing.

ABSTRAK

Hipertensi merupakan masalah kesehatan global utama dengan prevalensi yang terus meningkat pada lanjut usia serta memerlukan penatalaksanaan yang komprehensif selain terapi farmakologis. Dari perspektif keperawatan gerontik, penguatan kemampuan perawatan diri, termasuk menjaga kebersihan diri, sangat penting untuk mencegah komplikasi dan meningkatkan luaran kesehatan. Namun, perubahan kognitif dan sensorik yang terjadi seiring proses penuaan sering kali mengurangi efektivitas metode pendidikan kesehatan konvensional. Penelitian ini bertujuan mengevaluasi efektivitas video edukasi berbasis masyarakat dalam meningkatkan pengetahuan tentang kebersihan diri pada lanjut usia dengan hipertensi. Penelitian kuantitatif dengan desain pra-eksperimental one-group pretest–posttest dilakukan pada 38 lanjut usia berusia ≥60 tahun yang direkrut menggunakan teknik purposive sampling di sebuah puskesmas di Kota Samarinda, Kalimantan Timur, Indonesia. Pengetahuan diukur menggunakan kuesioner terstruktur yang telah memenuhi uji validitas dan reliabilitas sebelum dan sesudah peserta menyaksikan video edukasi berdurasi tujuh menit yang dikembangkan berdasarkan prinsip-prinsip keperawatan gerontik. Data dianalisis menggunakan statistik deskriptif dan Wilcoxon Signed Rank Test. Pengetahuan mengenai kebersihan diri meningkat secara signifikan setelah intervensi. Sebelum intervensi, sebagian besar peserta memiliki tingkat pengetahuan baik atau sedang, sedangkan setelah intervensi seluruh peserta mencapai kategori pengetahuan baik dengan peningkatan yang bermakna secara statistik. Temuan ini menunjukkan bahwa video edukasi berbasis masyarakat merupakan strategi yang efektif, praktis, dan sesuai dengan karakteristik lanjut usia untuk meningkatkan pengetahuan tentang kebersihan diri serta layak diintegrasikan ke dalam layanan promotif dan preventif keperawatan gerontik di fasilitas pelayanan kesehatan primer maupun di masyarakat.

Kata kunci: Hipertensi, Lansia, Kebersihan Diri, Video Edukasi Kesehatan, Keperawatan Gerontik.

INTRODUCTION

Hypertension remains a major global public health concern, with a continuously rising prevalence, especially among older adults. An estimated 1.28 billion adults worldwide live with hypertension, and the condition is a primary risk factor for cardiovascular-related morbidity and mortality (WHO, 2025). In Indonesia, older adults account for more than 60% of the hypertensive population, highlighting the need to prioritize this age group within primary health care programs (Kementerian Kesehatan Republik Indonesia, 2019). Hypertension in the elderly is closely associated with dietary habits, particularly excessive salt intake, high-fat food consumption, smoking, and insufficient physical activity (Syarli et al., 2021).

Ageing is associated with structural and functional changes in the cardiovascular system, including arterial stiffening and reduced vascular elasticity, which contribute to the increasing prevalence of hypertension among older adults. Consequently, hypertension remains one of the most common chronic conditions affecting individuals aged 60 years and above (Benetos et al., 2019). The International Society of Hypertension (ISH) further recognizes hypertension as one of the leading causes of premature death worldwide and emphasizes that effective hypertension management requires not only pharmacological treatment but also patient education, lifestyle modification, and community-based health promotion strategies to improve long-term disease control (Unger et al., 2020)

Hypertension management in older adults necessitates a holistic approach beyond pharmacological treatment, focusing on the enhancement of self-care abilities. Personal hygiene is recognized as an essential component of self-care and healthy ageing. The World Health Organization defines healthy ageing as the process of developing and maintaining functional ability that enables well-being in older age. Functional ability is influenced by an individual's physical and mental capacities, environmental factors, and their interactions (WHO, 2025). Within this framework, the ability to perform personal hygiene activities independently represents an important aspect of self-care and functional capacity among older adult. Personal hygiene is also a fundamental component of Activities of Daily Living (ADLs), which are widely used to assess functional independence among older adults. ADLs include essential self-care activities such as bathing, grooming, oral hygiene, dressing, eating, and toileting. The ability to perform these activities independently is strongly associated with autonomy, quality of life, and healthy ageing, whereas limitations in ADLs may increase dependence and adverse health outcomes among older adults (Edemekong et al., 2025). Maintaining healthy behaviours throughout life contributes to reducing the risk of noncommunicable diseases, preserving physical and mental capacity, and delaying care dependency among older adults (WHO, 2025). Appropriate personal hygiene practices contribute to maintaining skin integrity, preventing infections, promoting comfort, and supporting functional independence. Furthermore, self-care has been identified as a fundamental element in the management of chronic conditions, enabling older adults to maintain health, manage symptoms, and improve quality of life (Lawless et al., 2023). Although personal hygiene is not a direct treatment for hypertension, it forms part of broader self-care behaviours that support overall health maintenance and comprehensive hypertension management in older adults. In addition, inadequate hygiene may increase the risk of infections that can worsen health outcomes in vulnerable older adults, including those living with hypertension (World Health Organization, 2020).

Nevertheless, the complexity of age-related changes frequently limits older adults' ability to acquire sufficient health-related knowledge. Learning among the elderly is associated with specific challenges, including cognitive decline, visual and auditory impairments, and reduced working memory capacity (Cheng et al., 2020). Conventional educational methods, such as lectures and printed leaflets, often encounter substantial barriers to effectiveness. Evidence suggests that a large proportion of orally delivered information is forgotten shortly after the session ends (Kessels, 2003), while printed materials frequently exceed the average patient's readability level, thereby failing to significantly improve health literacy (Haji, 2019). This gap between the knowledge required and the knowledge actually possessed by older adults contributes to suboptimal self-care practices and health outcomes. Addressing this disparity is a key focus of gerontologic nursing within health promotion efforts, which aim to maintain health and optimize the functional condition of older adults by supporting the adoption and maintenance of healthy behaviors (Kholifah, 2016).

Health education represents an essential strategy for health maintenance among older adults, and the use of video-based educational media has emerged as a promising solution in this context. Video media that integrate audio and visual elements allow for repetition, clear procedural demonstrations, and structured information delivery. This approach aligns with the principles of multimedia learning, which support cognitive processing in older adults (Mayer, 2002). The philosophy of gerontologic nursing emphasizes empowerment, independence, and quality of life within familiar environments, while community-based approaches enhance the relevance and accessibility of interventions (Eliopoulos, 2018).

The potential of video-based education is supported by emerging evidence. A systematic review confirmed the effectiveness of video interventions in improving health-related knowledge among older adults (Peng et al., 2020). In addition, previous studies have demonstrated that visual educational media can significantly enhance knowledge related to hypertension prevention and self-management (Nurapandi et al., 2025). However, despite the growing evidence on educational interventions for hypertension, most studies have primarily focused on medication adherence, dietary modification, physical activity, and lifestyle management. Limited attention has been given to personal hygiene education as part of comprehensive gerontologic nursing care for hypertensive older adults, particularly in community settings. Furthermore, evidence regarding the effectiveness of community-based educational video interventions in improving personal hygiene knowledge among hypertensive older adults remains scarce. This gap is important because personal hygiene knowledge may support self-care capacity, functional independence, and overall well-being among older adults living with chronic conditions. Therefore, further research is needed to explore innovative educational approaches that strengthen self-care capacity and support healthy ageing among this population.

Based on this analysis, the present study was designed to address this gap by examining a community-based educational video intervention aimed at improving personal hygiene knowledge among hypertensive older adults. The aim of this study was to analyze the effectiveness of a community-based educational video intervention in improving personal hygiene knowledge among older adults with hypertension. The findings of this study are expected to contribute to the body of gerontologic nursing interventions that are effective, practical, and applicable across various primary health care and community settings, while also supporting self-care practices and healthy ageing among older adults with hypertension.

RESEARCH METHODS

A quantitative pre-experimental study employing a one-group pretest–posttest design was conducted at a public health center in Samarinda City, East Kalimantan, Indonesia, between October and December 2024. A total of 38 older adults aged ≥ 60 years were recruited using purposive sampling. Participants completed a baseline assessment (pretest) before receiving the intervention and a posttest immediately after the intervention. The study aimed to evaluate the effectiveness of video-based health education in improving older adults' knowledge of personal hygiene.

Data were collected using a researcher-developed structured questionnaire assessing knowledge of personal hygiene practices, including bathing, hand hygiene, oral and dental care, nail care, and hair care. The instrument demonstrated acceptable validity ($p < 0.05$) and internal consistency reliability, with a Cronbach's alpha coefficient of 0.693. The educational intervention was developed according to gerontological nursing principles, considering age-related physiological changes, cognitive decline, and functional limitations commonly experienced by older adults. The intervention consisted of a seven-minute educational video incorporating simple language, clear visual illustrations, a slower presentation pace, and repetitive key messages to accommodate age-related cognitive and sensory limitations and enhance participants' comprehension and information retention.

Descriptive statistics were used to summarize participants' demographic characteristics and knowledge scores. Differences between pretest and posttest knowledge scores were analyzed using the Wilcoxon Signed Rank Test, with statistical significance established at $p < 0.05$. Ethical approval was obtained from the Health Research Ethics Committee of the Faculty of Medicine, Mulawarman University (No. 305/KEPK-FK/XI/2024). Written informed consent was obtained from all participants prior to data collection, and participant confidentiality and

anonymity were strictly maintained throughout the study. Participants were also informed of their right to withdraw from the study at any stage without any consequences.

RESULTS

Table 1. Socio-demographic characteristics of the study participants (n = 38).

Variable	Frequency (f)	Percentages (%)
Age		
60-79	30	78.9
75-90	7	18.4
>90	1	2.7
Gender		
Male	9	23.7
Female	29	76.3
Education Background		
No formal education	18	47.4
Elementary school	9	23.7
Junior high school	6	15.8
High school	5	13.1
Work		
Not working	3	7.9
Housewife	9	23.7
Farmer	25	65.8
Retired Civil Servant	1	2.6
Marital Status		
Married	29	76.3
Widowed	7	18.4
Divorced	2	5.3
Tribe		
Javanese	34	89.5
Toraja	3	7.9
Banjar	1	2.6
Duration of Illness		
Descendants	7	18.4
Less than 50 years	12	31.6
More than 50 years	6	15.8
Forgot	13	34.2
Total	38	100

Based on Table 1, most respondents were aged 60–79 years (30 people; 78.9%). The majority were female (29 people; 76.3%), while male respondents accounted for 9 people (23.7%). Regarding educational background, nearly half of the older adult had no formal education (18 people; 47.4%), followed by elementary school graduates (9 people; 23.7%), junior high school graduates (6 people; 15.8%), and senior high school graduates (5 people; 13.2%). In terms of occupation, most respondents were farmers (25 people; 65.8%), followed by housewives (9 people; 23.7%), unemployed individuals (3 people; 7.9%), and retired civil servants (1 person; 2.6%). Most respondents were married (29 people; 76.3%), while 7 respondents (18.4%) were widowed and 2 respondents (5.3%) were divorced. The majority of respondents belonged to the Javanese ethnic group (34 people; 89.5%).

Regarding the duration of hypertension, 13 respondents (34.2%) could not recall when they were first diagnosed. Meanwhile, 12 respondents (31.6%) reported having hypertension before the age of 50, 6 respondents (15.8%) after the age of 50, and 7 respondents (18.4%) reported a family history of hypertension. From a gerontological nursing perspective, these demographic characteristics suggest the need for age-appropriate and function-sensitive health education strategies to support self-care among older adult individuals with hypertension

Table 2. Comparison of personal hygiene knowledge scores among older adults with hypertension before and after the health promotion intervention.

Knowledge Level	Pre-Test (n)	Percentage (%)	Post-Test (n)	Percentage (%)	Value
Good	25	65.8	38	100	0.000
Moderate	11	28.9	0	0	
Poor	2	5.3	0	0	

Based on Table 2, Wilcoxon analysis, prior to the health promotion intervention, most respondents had a good level of knowledge regarding personal hygiene (25 people; 65.8%), while 11 respondents (28.9%) had a moderate level of knowledge and 2 respondents (5.3%) had a low level of knowledge. Following the health promotion intervention, all respondents demonstrated a good level of knowledge (38 people; 100%), indicating a marked improvement compared to the pre-intervention condition.

The Wilcoxon test results showed a statistically significant difference in knowledge levels before and after the intervention ($p < 0.05$), indicating that health promotion had a significant effect on improving personal hygiene knowledge among older adult individuals with hypertension. From a gerontological nursing perspective, these findings suggest that health education tailored to older adults may support personal hygiene knowledge among older adult individuals with hypertension.

The mean knowledge score increased from 4.11 ± 1.01 during the pre-test to 4.97 ± 0.16 during the post-test. Wilcoxon Signed Rank Test showed a statistically significant improvement in personal hygiene knowledge following the intervention ($Z = -3.954$, $p < 0.001$). The calculated effect size was large ($r = 0.64$), indicating a substantial practical impact of the educational video intervention.

DISCUSSION

The findings indicate that most respondents were aged 60–79 years and predominantly female. This pattern reflects the demographic structure of the older population in Indonesia, where women have a higher life expectancy and are therefore more likely to participate in community-based health services (Kementerian Kesehatan Republik Indonesia, 2019). From a gerontic nursing perspective, individuals in this age group commonly experience physiological and functional changes that may affect their ability to perform self-care activities independently, including personal hygiene.

Most respondents had low formal educational attainment and were engaged in agricultural work. Limited educational background may influence older adults' initial health literacy, particularly in understanding the role of personal hygiene in chronic disease management. However, previous studies suggest that knowledge acquisition among older adults is not solely determined by formal education but can also be shaped by life experience, informal learning, and environmental support. Similarly, (Kavit et al., 2022) reported that age is not significantly associated with health literacy when older adults are able to engage in continuous learning. These findings highlight the importance of providing health education that is simple, contextual, and adapted to older adults' educational and experiential backgrounds, a key principle in gerontic and community nursing.

This study demonstrated a significant increase in personal hygiene knowledge following the community-based health education intervention. In addition to statistical significance, the intervention demonstrated a large practical effect ($r = 0.64$), indicating that the observed improvement in knowledge was not only statistically meaningful but also educationally relevant. This finding suggests that video-based health education may represent an effective strategy for enhancing health literacy among older adults with chronic conditions. Improved health literacy enables older adults to better understand health-related information and may facilitate informed decision-making regarding daily self-care activities. Although the present study did not directly evaluate behavioral outcomes, the substantial improvement in knowledge provides an important foundation for future interventions aimed at strengthening self-management and healthy ageing among older adults with hypertension. The improvement in knowledge observed in this study may also reflect enhanced health literacy among participants. Health literacy encompasses an individual's ability to access, understand, evaluate, and apply health information to make appropriate health-related decisions. Nutbeam and Lloyd (2021) identified health literacy as an

important determinant of health outcomes, particularly among individuals with chronic conditions. Therefore, the increased knowledge demonstrated by participants following the intervention may strengthen their capacity to understand and utilize health information relevant to personal hygiene and overall health maintenance (Nutbeam & Lloyd, 2021).

All respondents achieved a good level of knowledge after the intervention, indicating that the educational approach was effective in improving knowledge among older adults with hypertension. This finding is consistent with (Widodo & Setyaningsih, 2020), who reported that tailored health education interventions at the community level contributed to improved knowledge and attitudes among older adults. These results reinforce the value of community-based education programs that are designed according to the specific needs of older populations.

The effectiveness of the intervention may be attributed to the use of video-based educational media. Video enables the delivery of information through visual and auditory channels, which is particularly beneficial for older adults with limited literacy or age-related sensory decline. This modality is particularly advantageous for older adults with limited literacy skills or age-related sensory decline. Previous studies have indicated that the effectiveness of health education is also influenced by factors such as age and prior access to health-related information (Marliza et al., 2023). From a gerontic nursing perspective, educational strategies should accommodate changes in cognitive and sensory function by using clear, simple, and easily understandable messages. This approach reflects client-centred nursing practice and supports effective knowledge transfer. Similar findings were reported, who found that visual-based health education significantly improved older adults' knowledge regarding hypertension prevention. Although their study focused on general disease prevention, the educational principles are applicable to personal hygiene as a component of self-care (Nurapandi et al., 2025).

The use of educational video in this study also aligns with evidence that audiovisual media represent a form of gerontechnology capable of enhancing health literacy and supporting independence among older adults (Gaúcha et al., 2025). While the focus of previous research varied, the underlying principle of using simple, visual, and contextual media is relevant to personal hygiene education as part of daily self-care. Such approaches support nurses in facilitating older adults' understanding of practical self-care activities.

From a nursing perspective, video-based education reflects the role of nurses as educators within primary health care and community settings (Yardas et al., 2025). Gerontic nurses play a strategic role in delivering health information that aligns with older adults' functional abilities and learning needs, including promoting personal hygiene as an essential element of self-care for older adults with hypertension.

Improved knowledge of personal hygiene has important implications for hypertension management among older adults. Personal hygiene is a basic self-care activity that contributes to skin integrity, infection prevention, and physical comfort. In gerontic nursing, meeting basic needs extends beyond disease prevention to include maintaining independence and quality of life. The findings of this study support the Healthy Ageing framework which emphasizes strengthening health literacy through community-based interventions to preserve functional ability in later life (World Health Organization, 2020). The present findings are also aligned with the World Health Organization's Decade of Healthy Ageing framework, which emphasizes the importance of maintaining functional ability through interventions that strengthen knowledge, autonomy, and self-management capacity among older adults (WHO, 2021). Educational interventions delivered within community settings may contribute to creating supportive environments that enable older adults to maintain independence and participate actively in managing their health throughout later life (WHO, 2021).

Furthermore, personal hygiene is closely related to Activities of Daily Living (ADLs), which are widely recognized indicators of functional independence among older adults. Improving knowledge related to personal hygiene may contribute to maintaining autonomy and supporting functional ability, both of which are central goals of healthy ageing. Therefore, integrating personal hygiene education into community-based gerontologic nursing programs may provide benefits beyond knowledge acquisition by supporting older adults' capacity to manage daily self-care activities independently.

In community nursing practice, the health education intervention implemented in this study illustrates the nurse's role as an educator and facilitator in enhancing older adults' self-care

capacity. Integrating personal hygiene education into routine community-based older adult health activities may support promotive and preventive efforts in the long-term management of hypertension

This study has several limitations. First, the use of a one-group pretest–posttest design without a control group limits the ability to attribute the observed improvements solely to the educational intervention. Second, the relatively small sample size and single-center setting may limit the generalizability of the findings. Third, the study assessed only immediate post-intervention knowledge outcomes and did not evaluate long-term knowledge retention or behavioral changes. Future studies employing controlled or randomized designs, larger samples, and longer follow-up periods are recommended to strengthen the evidence regarding the effectiveness of community-based video education among older adults with hypertension.

CONCLUSION

This study concludes that community-based health education using educational video media effectively improves personal hygiene knowledge among older adults with hypertension. The significant increase in knowledge following the intervention suggests that simple, visual, and age-appropriate educational approaches are effective for health promotion among older adult populations. These findings highlight the important role of nurses in delivering promotive and preventive interventions within primary health care settings to support healthy ageing among older adults. However, as this study assessed knowledge outcomes only, future research is needed to evaluate the effects of video-based educational interventions on self-care behaviors and clinical outcomes among older adults with hypertension.

REFERENCES

- Benetos, A., Petrovic, M., & Strandberg, T. (2019). Hypertension management in older and frail older patients. *Circulation Research*, 124(7), 1045–1060. <https://doi.org/10.1161/CIRCRESAHA.118.313236>
- Cheng, H., Lin, H., Wang, T., & Chen, C. (2020). Asian management of hypertension: Current status, home blood pressure, and specific concerns in Taiwan. *The Journal of Clinical Hypertension*, 22(3), 511–514. <https://doi.org/10.1111/jch.13747>
- Edemekong, P. F., Bomgaars, D. L., Sukumaran, S., & Schoo, C. (2025). *Activities of Daily Living*. <https://www.ncbi.nlm.nih.gov/books/NBK470404/>
- Eliopoulos, C. (2018). *Gerontological Nursing*. Philadelphia: Wolters Kluwer Health.
- Gaúcha, R., Laura, K., Silva, D. F., Amanda, M., Leite, P., Mirella, R., & Lima, S. (2025). Educational video for elderly people about nursing care in therapeutic bloodletting. *Revista Gaúcha de Enfermagem*, 46, e20240198. <https://doi.org/10.1590/1983-1447.2025.20240198.en>
- Haji, A. (2019). Patients' utilisation and perception of the quality of printed health education materials in primary health care: A cross-sectional study. *BJGP Open*, 3(4), 1–8. <https://doi.org/10.3399/BJGPOPEN19X101672>
- Kavit, M. A.A.A., Dharminto, Tri Purnami, C., & Agushybana, F. (2022). Hubungan faktor demografi dengan literasi kesehatan tentang penyakit tidak menular pada lansia [The relationship between demographic factors and health literacy regarding noncommunicable diseases among older adults]. *Jurnal Manajemen Kesehatan Indonesia*, 10(2), 95–105. <https://doi.org/10.14710/jmki.10.2.2022.95-105>
- Kementerian Kesehatan Republik Indonesia. (2019). *Laporan nasional riset kesehatan dasar (Riskesdas) 2018 [National report of basic health research (Riskesdas) 2018]*. Badan Penelitian dan Pengembangan Kesehatan.
- Kessels, R. P. (2003). Communicating with patients: Improving communication, satisfaction and compliance. *Journal of The Royal Society of Medicine*, 96(3), 219–222. [https://doi.org/10.1016/0738-3991\(90\)90107-v](https://doi.org/10.1016/0738-3991(90)90107-v)
- Kholifah, S. N. (2016). *Buku ajar keperawatan gerontik edisi 1* [Gerontological nursing textbook, 1st edition]. Jakarta: Kementerian Kesehatan Republik Indonesia.
- Lawless, M. T., Tieu, M., Chan, R. J., Hendriks, J. M., & Kitson, A. (2023). Instruments measuring self-care and self-management of chronic conditions by community-dwelling older adults: a scoping review. *Journal of Applied Gerontology*, 42(7), 1687–1709.

- <https://doi.org/10.1177/07334648231161929>
- Marliza, H. ., Rury, R. T. U., Ramadhani, F. ., & Elfasyari, T. Y. . (2023). Uji aktivitas antibakteri ekstrak selaput umbi bawang putih (*allium sativum*) terhadap bakteri *staphylococcus aureus* dan *Escherichia coli*. *Ahmar Metastasis Health Journal*, 3(1), 1–7. <https://doi.org/10.53770/amhj.v3i1.175>
- Mayer, R. E. (2002). Multimedia learning. In psychology of learning and motivation. *Academic Press*, 41, 85–139. [https://doi.org/10.1016/S0079-7421\(02\)80005-6](https://doi.org/10.1016/S0079-7421(02)80005-6)
- Nurapandi, A., Rahman, I. A., Mjw, E., Miranda, A., & Firdaus, N. R. (2025). The effect of visual media education on the level of knowledge of the elderly about the prevention of hypertension. *HealthCare Nursing Journal*, 7(1), 21–27. <https://doi.org/10.35568/healthcare.v7i1.5691>
- Nutbeam, D., & Lloyd, J. E. (2021). *Understanding and Responding to Health Literacy as a Social Determinant of Health*. *Annual Review of Public Health*, 42, 159–173. <https://doi.org/10.1146/annurev-publhealth-090419-102529>
- Peng, Y., Wang, H., Fang, Q., Xie, L., Shu, L., Sun, W., & Liu, Q. (2020). Effectiveness of mobile applications on medication adherence in adults with chronic diseases: A systematic review and meta-analysis. *Journal of Managed Care and Speciality Pharmacy*, 26(4), 550–561. <https://doi.org/10.18553/jmcp.2020.26.4.550>
- Syarli, S. ., & Arini, L. . (2021). Factors causing hypertension in the elderly: literature review: faktor penyebab hipertensi pada lansia: literatur review. *Ahmar Metastasis Health Journal*, 1(3), 112–117. <https://doi.org/10.53770/amhj.v1i3.11>
- Unger, T., Borghi, C., Charchar, F., Khan, N. A., Poulter, N. R., Prabhakaran, D., Ramirez, A., Schlaich, M., Stergiou, G. S., Tomaszewski, M., Wainford, R. D., Williams, B., & Schutte, A. E. (2020). 2020 International Society of Hypertension global hypertension practice guidelines. *Hypertension*, 75(6), 1334–1357. <https://doi.org/10.1161/HYPERTENSIONAHA.120.15026>
- WHO. (2021). *Decade of healthy ageing: baseline report*. WHO. Retrieved from <https://www.who.int/publications/i/item/9789240017900>
- WHO. (2025). *Ageing and health*. WHO. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>
- Widodo, W., & Setyaningsih, N. (2020). The influence of health education about physical activity on the knowledge and attitudes of the elderly in Gunung Kidul Village. *Indonesian Nursing Journal*, 23(4), 247-256.
- World Health Organisation. (2020). *Global report on the epidemiology and burden of sepsis: current evidence, identifying gaps and future directions*. World Health Organization.
- World Health Organization. (2020). *Operational guidance for maintaining essential health services during an outbreak*. World Health Organization. Retrieved from <https://www.who.int/publications-detail/covid-19-operational-guidance-for-maintaining-essential-health-services-during-an-outbreak>
- Yardas, N., Iriana, P., Riyanti, E., Pangastuti, T. E., Resnayanti, Y., & Silviani, N. E. (2025). The influence of educational videos on early prevention of stroke against stroke risk in the elderly. *JKEP (Jurnal Keperawatan)*, 10(1), 92–99. <https://doi.org/10.32668/jkep.v10i1.1998>