INDOGENIUS

ISSN 2828-1365

Volume 5, Issue 2 : 658-668

The Effect of Educational Videos on the Level of Hypertension Knowledge at the Muara Bangkahulu Community Health Center, Bengkulu City

Amelia Cantika Hendri[1], Samwilson Slamet[1], Dwi Kurnia Putri[1], Tri Danang Kurniawan[1], Rizqa Hasanah[1]

[1]*University of Bengkulu, Indonesia*

Article Info

Keywords :
Health Education, Hypertension, Knowledge, Learning Videos, Medication Compliance

Corresponding Author :
Amelia Cantika Hendri
E-mail : dwikp15@unib.ac.id

ABSTRACT

Background & Objective: Hypertension is a chronic disease that is a major risk factor for global mortality. This study aims to analyze the effect of providing educational videos on the level of knowledge of hypertensive patients about health management and medication adherence. **Method:** A quasi-experimental study with a pre- test and post-test design was conducted on 55 respondents at the Muara Bangkahulu Community Health Center, Bengkulu City, from January to March 2026. Data were collected using the Hypertension Knowledge-Level Scale (HK-LS) questionnaire consisting of 24 items. **Result:** Before the intervention, the majority of respondents were in the sufficient (69%) and poor (25%) knowledge categories, with an average score of 15.25. After the educational video was provided, there was a significant increase with the good category increasing to 27%, sufficient to 73%, and no more respondents in the poor (0%) category, with an average score increasing to 17.40. The Wilcoxon Signed Rank Test showed a p-value <0.001, indicating a very significant effect of education on increasing knowledge. A total of 53 respondents (96.4%) experienced an increase in knowledge after the intervention. **Conclusion:** In conclusion, educational videos have proven effective in improving the knowledge of hypertension patients, particularly regarding pharmacological adherence, healthy lifestyles, and understanding of disease complications. Recommendations include implementing ongoing education, using diverse media for different levels of education, and further research focusing on behavior change and long-term retention.

DOI: https://doi.org/10.56359/igj.v5i2.1085

Introduction

Hypertension is a chronic health condition characterized by elevated systolic blood pressure of ≥139 mmHg and or diastolic blood pressure of ≥89 mmHg on repeated measurements (Kementerian Kesehatan RI, 2024). According to the World Health Organization (WHO) in 2021, hypertension causes 8 million deaths per year worldwide, with 2 million deaths occurring in Southeast Asia. In Indonesia, the prevalence of hypertension, according to the 2022 Basic Health Research (Riskesdas), reached 36.3% of the total adult population, with Bengkulu Province recording a prevalence of 13.7% in 2024. This disease is often referred to as a "silent killer" because many sufferers do not show clear symptoms, often resulting in delayed diagnosis and leading to serious complications such as heart disease, stroke, and kidney failure.

Low public knowledge about hypertension is a major cause of non- adherence to treatment. Previous research by Krisdianawati (2016) showed that providing education significantly impacted medication adherence in hypertensive patients with a p-value of 0.00 ($p < 0.05$). However, research on the effectiveness of video-based educational media is still limited in the Bengkulu region. Video was chosen because of its advantage in presenting audiovisual information that is engaging and easily understood by people of all ages and educational backgrounds (Ho et al., 2021).

The Muara Bangkahulu Community Health Center (Puskesmas) has identified a need to improve the knowledge of hypertension patients about health management, particularly regarding medication adherence, diet, and complication prevention. With a population of 121 hypertension patients (data from January to August 2025), an effective and accessible educational strategy is needed for all patient segments.

Objective

The purpose of this study was to analyze the effect of providing educational videos on the knowledge level of hypertension patients at the Muara Bangkahulu Community Health Center, Bengkulu City.

Method

This study used a quasi-experimental design with a pre-test and post-test. The study was conducted in the Muara Bangkahulu Community Health Center (Puskesmas) working area, Bengkulu City, from January to March 2026. This design was chosen to measure changes in respondents' knowledge levels before and after receiving an educational intervention using video.

The study population was all 121 hypertensive patients registered at the Muara Bangkahulu Community Health Center (data from January to August 2025). The sample was determined using a purposive sampling method with the following inclusion criteria: (1) hypertensive patients aged >18 years, (2) willing to participate and sign an informed consent, (3) able to see, read, and hear, (4) able to communicate well, and (5) understand Indonesian. Exclusion criteria included respondents experiencing medical conditions that interfered with the study or who were unwilling to continue. The sample size was calculated using the Slovin formula with a 95% confidence level and a 5% margin of error, resulting in 55 respondents..

The research instrument was the HK-LS (Hypertension Knowledge-Level Scale) questionnaire, consisting of 24 closed-ended questions. It covered six aspects of knowledge: the definition of hypertension (2 items), pharmacological therapy (9 items), medication adherence (3 items), lifestyle (2 items), hypertension diet (3 items), and complications (5 items). Each item had three answer choices (true, false, don't know), with a score of 1 for a correct answer and 0 for a false or don't know answer. The intervention media consisted of a 4-minute 40-second educational video discussing the definition, symptoms, risk factors, complications, and prevention of hypertension.

Data collection procedures included: (1) administrative preparation, including obtaining permits; (2) data collection of eligible respondents; (3) explanation of the research objectives and informed consent; (4) a pre-test using the HK-LS questionnaire to measure initial knowledge; (5) provision of the intervention, which included showing the educational video (1 session); and (6) a post-test using the same HK-LS questionnaire.

Univariate analysis was conducted to describe respondent characteristics (age, gender, education, occupation) using frequency distributions and descriptive statistics. Bivariate analysis used the Shapiro-Wilk normality test to examine data distribution. Since the data were not normally distributed ($p < 0.05$), the hypothesis test used the non-parametric Wilcoxon Signed Rank Test to compare knowledge scores before and after education. Data processing was performed using the SPSS version 26.0 program. Knowledge levels were categorized as: Good (76%-100%), Sufficient (56%-75%), and Poor (<56%).

Results

This research was conducted in the Muara Bangkahulu Community Health Center (Puskesmas) in Bengkulu City, with the aim of analyzing the effect of educational videos on public knowledge about hypertension. Prior to conducting the study, the researcher obtained administrative permits by submitting a research introductory letter from the Bengkulu Ministry of Health Polytechnic to the Bengkulu City Agency for National Unity and Politics (Kesbangpol). After obtaining approval, the permit was forwarded to the Bengkulu City Health Office and the Muara Bangkahulu Community Health Center, the location of the study.

Initial data collection was conducted on hypertension patients registered at the Muara Bangkahulu Community Health Center. From the patient registration records for hypertension between January and August 2025, 121 patients were identified. Using a purposive sampling method with established inclusion and exclusion criteria, 55 respondents met the criteria and agreed to participate. No respondents withdrew during the study, allowing for complete data analysis. Before administering the intervention, the researcher explained the purpose of the study and obtained informed consent from the respondents. After obtaining consent, respondents were given a pre-test questionnaire to measure their initial knowledge about hypertension.

Univariate analysis was conducted to describe the demographic characteristics of the study respondents, including gender, age, education level, and occupation. Data were analyzed using descriptive statistics to display frequency distributions and percentages. The total number of respondents in the study was 55.

TABLE 1. Gender Distribution Profile of Hypertension Patients (n=55)

Gender	Frequency (n)	Percentage (%)
Male	22	40
Female	33	60
Total	55	100

The majority of respondents were women, with a frequency of 33 respondents (60%), compared to 22 men (40%). The higher proportion of women reflects their tendency to be more proactive in seeking health information and visiting health facilities. This is important because women in the family often play a key role in family health decision-making, so the knowledge they gain can have a direct impact on hypertension prevention efforts at the household level.

TABLE 2. Age Distribution Profile of Hypertension Patients (n=55)

Age (Years)	Frequency (n)	Percentage (%)
18-25 (Late Teenagers)	0	0
26-35 (Early Adults)	1	2
36-45 (Late Adults)	2	4
46-55 (Pre-Elderly)	10	18
56-65 (Seniors)	27	49
> 65 (Seniors)	15	27

The highest requency was in the 56-65 years age group (elderly) with 27 respondents (49%), followed by >65 years (elderly) with 15 respondents (27%), 46-55 years (pre-elderly) with 10 respondents (18%), 36-45 years old with 2 respondents (4%), 26-35 years old with 1 respondent (2%), and no respondents aged 18-25 years. The majority of respondents were in the age range of 56 years and above (76%), indicating that hypertension is predominantly experienced by the elderly group. This is in line with the theory that as age increases, the elasticity of blood vessels decreases so that blood pressure increases. In adulthood, the motivation to learn health information also usually increases due to awareness of the risk of declining body functions and the need to prevent complications.

The majority had a high school education (27 respondents (49%), followed by 21 respondents (38%), junior high school (4 respondents (7%), master's (3 respondents (5%), and none with an elementary school education (0%). This combination shows that 87% of respondents had at least a high school education and had sufficient literacy skills to understand health management concepts and medical terms. Higher formal education makes it easier for someone to develop reasoning and receive new information. This good level of education is a supporting factor in absorbing the educational information provided in the video, allowing respondents to better understand the message and connect it to their previous knowledge.

TABLE 3. Distribution Profile of Education Level of Hypertension Patients (n=55)

Education	Level Frequency (n)	Precentage (%)
Elementary School	0	0
Junior High School	4	7
High School	27	49
Bachelor's Degree	21	38
Master's Degree	3	5

The largest occupational group was retired with 17 respondents (31%), followed by unemployed with 14 respondents (25%), civil servants and farmers with 9 respondents (16%) each, and traders with 6 respondents (11%). The predominance of retired respondents (31%) is associated with the majority age distribution of >56 years. The unemployed group (25%) likely comprised housewives or individuals no longer actively working. The diverse types of jobs indicate a sample from various socio-economic backgrounds. The work environment can provide experience and knowledge, both directly and indirectly. Employed respondents generally have access interactions, so they tend to be more open to new, educational information, such as health education videos.

TABLE 4. Occupational Distribution Profile of Hypertension Patients (n=55)

Job	Level Frequency (n)	Precentage (%)
Unemployed	0	0
Civil Servant	4	7
Trader	27	49
Retiree	21	38
Farmer	3	5

Before conducting a bivariate hypothesis test, a data normality test was first performed using the Shapiro-Wilk Test to determine the appropriate statistical test. The normality test is important for determining whether the data is normally distributed, which will determine whether parametric or non-parametric statistics will be used. The significance level used is a=0.05, with the condition that if the p- value <0.05 indicates the data is not normally distributed.

TABLE 5. Results of Respondents' Knowledge Normality Test (N=55)

Variables	Statistical (Shapiro-Wilk)	df	Sig (p-value)
Knowledge Before Education (Pre-test)	0,950	55	0,022
Knowledge After Education (Post-test)	0,952	55	0,029

Based on Table 5, the Shapiro-Wilk test results show a significance value (p-value) for the knowledge variable before education (pre-test) of 0.022 and after education (post-test) of 0.029. Because the p-value is <0.05 for both variables, it can be concluded that the respondents' knowledge data, both before and after education, is not normally distributed. This abnormal distribution of data can be caused by various factors, including high variability in respondents' responses to questionnaire items or the influence of outliers.

Due to the non-normal distribution of the data, the hypothesis test to evaluate differences in knowledge before and after the intervention used the non-parametric Wilcoxon Signed Rank Test, rather than the parametric paired t-test.

Respondents' knowledge data was categorized into three categories based on their scores: Good (76%-100%), Sufficient (56%-75%), and Poor (<56%). Knowledge levels were measured twice: before the intervention (pre-test) and after the intervention (post-test), to determine changes following the video education.

TABLE 6. Frequency Distribution of Knowledge Level Before and After Video Education (n=55)

Knowledge Category	Pre-Test	Post-Test	Change
Good (76%-100%)	3 (5%)	15 (27%)	+12 (22%)
Sufficient (56%-75%)	38 (69%)	40 (73%)	+2 (4%)
Poor (<56%)	14 (25%)	0 (0%)	-14 (-25%)
Total	55 (100%)	55 (100%)	

The data shows a significant change in knowledge distribution between the pre-test and post-test. In the pre-test phase (before education), the majority of respondents (69%; 38 people) had sufficient knowledge. Respondents with poor knowledge accounted for 25% (14 people), and only 5% (3 people) had good knowledge. The average knowledge score in the pre-test was 15.25 out of a maximum score of 24, indicating that respondents' initial understanding of hypertension was still limited.

After a one-session video education intervention, there was a dramatic increase in knowledge distribution. In the post-test phase (after education), the good knowledge category increased to 27% (15 people), representing an increase of 22%, or 12 respondents. The sufficient knowledge category remained dominant at 73% (40 people), representing an increase of 4%, or 2 respondents, from the pre-test. Most significantly, there was a complete disappearance of respondents in the poor knowledge category (0%), which previously comprised 25% of the total respondents. The average knowledge score in the post-test increased to 17.40, indicating an average increase of 2.15 points or 8.8% from the pre-test score. This increase reflects that respondents have successfully acquired and consolidated new knowledge about various aspects of hypertension covered in the educational video, namely: the definition and classification of hypertension, symptoms, risk factors, adherence to taking antihypertensive medication, a healthy diet for hypertension sufferers, appropriate lifestyle, and prevention of disease complications.

To test the significance of differences in knowledge levels before and after video education, a Wilcoxon Signed Rank Test was conducted. This test was chosen because the data did not meet the assumption of normality $p<0.05$ in the Shapiro-Wilk test. The Wilcoxon test is a non-parametric test that does not rely on the assumption of normal distribution of data and is suitable for paired data with small to medium sample sizes. In this test, the null hypothesis (H0) states that there is no significant difference between pre-test and post-test knowledge scores, while the alternative hypothesis (H1) states that there is a significant difference. The significance level used is $\alpha=0.05$

TABLE 7. Results of the Wilcoxon Signed Rank Test - Ranking of Changes in Knowledge Scores

Rank	Category	N	Mean Rank
Post-Test - Pre-Test	Negative Rank (Penurunan)	0	0,00
	Positive Rank (Peningkatan)	53	27,00
	Ties (Tetap)	2	-
	Total	**55**	

The Wilcoxon Signed Rank Test results (Tables 7 and 8) showed highly significant results. Of the 55 respondents analyzed, 53 (96.4%) experienced an increase in their knowledge scores (Positive Ranks), 2 (3.6%) remained the same (Ties), and 0 (0%) experienced a decrease in their scores (Negative Ranks). The mean rank for positive ranks was 27.00, indicating that positive changes were evenly distributed among respondents who experienced an increase.

The Z-statistic value for the test is - 6.395, with an Asymp. Sig. (2-tailed) value <0.001 (much smaller than $\alpha=0.05$). This means the p-value of this test is very small,

far below the 0.05 significance level. Based on the decision-making criteria, if the p-value <0.05, then H0 is rejected and H1 is accepted. Thus, it can be concluded that there is a VERY SIGNIFICANT effect of providing educational videos on improving the knowledge level of hypertension patients at the Muara Bangkahulu Community Health Center in Bengkulu City. The difference in knowledge before and after the education is not mere coincidence, but rather a real result of the educational intervention provided.

The findings of this study indicate that educational videos are highly effective in improving the knowledge of hypertension patients. The Wilcoxon test results, with a p-value <0.001, indicate an effect far exceeding the significance level of a=0.05. indicating that the increase in knowledge is a real result of the intervention, not a mere statistical coincidence.

Discussion

The success of these educational videos can be explained by several learning mechanisms. First, video is a multi-sensory medium that engages both sight and hearing simultaneously, creating a richer learning experience than conventional methods such as lectures or written handouts. The visual information combined with audio narration facilitates more effective encoding and retrieval of information into long-term memory. Second, the educational videos in this study were designed to be 4 minutes and 40 seconds long, sufficient to present comprehensive information without exceeding the audience's attention span, especially for the elderly, who may experience decreased concentration. Third, the video content covers six aspects of hypertension knowledge as measured by the HK-LS Scale: (1) definition and classification of hypertension, (2) symptoms and signs of hypertension, (3) risk factors and epidemiology, (4) adherence and pharmacological therapy (9 items), (5) lifestyle and dietary changes, and (6) complication prevention. The clear and progressive content structure helps respondents organize their knowledge hierarchically.

The increase in the average score from 15.25 to 17.40 (an 8.8% increase) reflects that respondents have successfully passed through the cognitive learning stages according to Bloom's taxonomy. Respondents have not only reached the level of "remembering" (remembering information) but also "understanding" (understanding concepts), and are expected to achieve "applying" (applying knowledge) in their daily lives. Notoatmodjo's (2014) theory states that knowledge is the result of sensing a particular object through the process of perception, which is then processed by the brain to produce meaning and understanding. The educational video in this study served as an optimal external stimulus to facilitate this sensory and cognitive processing process.

Analysis of Changes in Knowledge Category Distribution.

Analysis of changes in knowledge categories revealed a very dramatic and positive shift in distribution. The increase in the "Good" category from 5% to 27% (a 22 percentage point increase) indicates that the educational video effectively moved respondents from the low knowledge category to the high knowledge category. This is crucial because good knowledge is a prerequisite for long-term health behavior change. The "Fair" category remained the majority (73%) in the post-test, but this represents an increase from 69% in the pre- test, indicating that respondents initially in the "Poor" category moved to the "Fair" category.

Most significantly, there was a complete disappearance (100%) of respondents from the "Poor" category (<56%). In the pre-test, 25% of respondents (14 individuals) were in the poor knowledge category, indicating a very limited understanding of hypertension. After the education, all of these respondents successfully increased their knowledge to at least the "Fair" category. This achievement is crucial from a public health perspective because eliminating groups with significantly less knowledge means increasing the capacity of the entire population to understand and manage their disease. Therefore, the video education intervention can be considered an "inclusive" strategy for increasing health awareness in communities with diverse educational backgrounds.

The Role of Demographic Factors in Knowledge Absorption

A comprehensive analysis of the demographic characteristics of the respondents revealed that the demographic composition of the study contributed to the effectiveness of education. Respondents with at least a high school education (87%) possessed adequate literacy and abstract thinking skills to understand complex medical concepts, such as the pathophysiology of hypertension, the mechanisms of action of antihypertensive drugs, and long-term complications. According to Mubarak's (2011) theory, education facilitates the process of information acquisition and facilitates the integration of new knowledge into existing cognitive structures. With 87% of respondents having a high school education or higher, the majority of the study group had a strong cognitive foundation for processing educational information.

The age group of respondents (76% aged 56 years and above) also demonstrated relevance to educational effectiveness. Despite the common perception that older adults have slower learning rates, this study demonstrated that this age group was highly motivated to learn about their health. According to Erikson's developmental theory, in the "integrity vs. despair" stage (older age), individuals become more reflective and seek to understand the meaning of their lives.

Conclusion

Based on the research results and data analysis, it can be concluded that educational videos have a very significant impact on improving the knowledge level of hypertension patients at the Muara Bangkahulu Community Health Center in Bengkulu City. A total of 96.4% of respondents experienced an increase in knowledge after receiving educational intervention via video, with an average score of 8.8%. The "Good" knowledge category increased from 5% to 27%, the "Fair" category remained stable at 73%, and there were no more respondents in the "Poor" category. The Wilcoxon Signed Rank Test ($p<0.001$) demonstrated the effectiveness of educational videos in improving patient understanding of hypertension management, adherence to pharmacological treatment, lifestyle changes, healthy diet, and complication prevention.

Recommendations for implementing the findings of this study include: (1) For Community Health Centers and health facilities: Integrate educational videos as part of routine hypertension management programs, use a variety of media to reach groups with various education levels, and conduct ongoing education periodically rather than just a single session; (2) For future researchers: Conduct research with a longer follow-up period to measure knowledge retention, involve a control group to compare the effectiveness of various media, observe changes in respondents' behavior

and attitudes, and further analyze the dominant demographic factors that influence information absorption using correlation or regression analysis.

References

Anderson. (2019). Chronic care: Making the case for ongoing care. Robert Wood Johnson Foundation.

Barkmeier, A. J. (2021). Toward Optimal Screening for Diabetic Retinopathy: Balancing Precision and Pragmatism. Mayo Clinic Proceedings, 96(2), 282–284. https://doi.org/10.1016/j.may ocp.2020.12.008

Bosworth. (2019). Health information technology to improve medication adherence: A systematic review. Journal of General Internal Medicine, 8(34),1567–1576.

Cynober, L. A., Carpentier, Y. A., Bauer, J. M., Morley, J. E., Laviano, A., & Elango, R. (2018). Editorial introductions. Current Opinion in Clinical Nutrition & Metabolic Care, 21(1),v–vii. https://doi.org/10.1097/MCO.0000000000000436

Darung, A., Mei, D. D., & Romadon, V (2020). Pengembangan Media Pembelajaran Geografi Menggunakan Poster Infografis (Materi Dinamika Atmosfer) Development of Geography Learning Media Using Infographic Posters (Atmospheric Dynamics Material). -, 1(1), 27–41.

Dinas Kesehatan Provinsi Bengkulu. (2024). Data penyakit tidak menular (PTM) Provinsi Bengkulu tahun 2024. [Dataset].

Ding, Y., Lou, J., Chen, H., Li, X., Wu, M., Li, C., Liu, J., Liu, C., Li, Q., Zhang, H., & Niu, J. (2017). Tolerability, pharmacokinetics and antiviral activity of rHSA/IFNα2a for the treatment of chronic hepatitis B infection. British Journal of Clinical Pharmacology, 83(5), 1056–1071. https://doi.org/10.1111/bcp.1 3184

Edwards, K., Li, X., & Lingvay, I. (2023). and Safety Outcomoes With GLP-1

Gulliver, S. B., & Cohen, L. M. (Eds.). (2020). The Wiley Encyclopedia of Health Psychology (1st ed.). Wiley. https://doi.org/10.1002/9781 119057840

Harding. (2022). Pathogenesis of primary (essential) hypertension. In Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine Hemanthakumar, K. A., & Kivelä, R. (2020). Angiogenesis and angiocrines regulating heart growth. Vascular Biology, 2(1), R93–R104. https://doi.org/10.1530/VB- 20-0006

Ho, E. Y., Leung, G., Fung, J., & Jih, J. (2021). "I didn't know you were such a good cook": Photos as a tool for primary care clinician- patient communication. Patient Education and Counseling, 104(6), 1356–1363. https://doi.org/10.1016/j.pec. 2020.10.033

Horne, C., & Parham. (2020). The perceived sensitivity to medicines scale: A new tool for assessing beliefs about medicines. Journal of Psychosomatic Research, 129, 109–115.

Itano, S., Yano, Y., Nagasu, H., Tomiyama, H., Kanegae, H., Makino, H., Higashi, Y., Kobayashi, Y., Sogawa, Y., Satoh, M., Suzuki, K., Townsend, R. R., Budoff, M., Bakris, G., & Kashihara,N. (2020). Association of Arterial Stiffness With Kidney Function Among Adults Without Chronic Kidney Disease. American Journal of Hypertension, 33(11),1003–1010. https://doi.org/10.1093/ajh/h paa097

Kementerian Kesehatan RI. (2022). Laporan Nasional Riskesdas 2022 [Badan Penelitian dan Pengembangan Kesehatan].

Kettunen, S., Ruotsalainen, A.-K., & Ylä-Herttuala, S. (2022). RNA interference-based therapies for the control of atherosclerosis risk faktors. Current Opinion in Cardiology, 37(4), 364–371. https://doi.org/10.1097/HCO.0000000000000972

Kibria, G. M. A. (2021). Prevalence and Trends of Isolated Systolic Hypertension among Untreated Older People in the US according to the 2017 ACC/AHA Guideline, 2001–16. Journal of Human Hypertension, 35(1)101–103. https://doi.org/10.1038/s4137 1-020-0351-3

Knipps, M. L., & Klenzner, T. (2023). Size matters – how big is big? Size estimation of physicians. s-0043-1767665. https://doi.org/10.1055/s- 0043-1767665

Landsberg. (2021). Recognition of Reviewers. The Journal of Clinical Endocrinology & Metabolism, 106(3), 609–621. https://doi.org/10.1210/cline m/dgab068

Libby, Z. (2022). Systemic hypertension: Mechanisms and diagnosis. In Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine.

Ma, M., & Joshi, G. (2022). Unpacking the Complexity of Migrated Older Adults' Lives in the United Kingdom Through an Intersectional Lens: A Qualitative Systematic Review. The Gerontologist, 62(7), e402–e417. https://doi.org/10.1093/gero nt/gnab0331-019-0244-2

Morabia, A. (2018). Teachers in Arms? A Special Section of AJPH. American Journal of Public Health, 108(7), 845– 846. https://doi.org/10.2105/AJP H.2018.304502

Nugroho, P. (2021). Keperawatan gerontik & geriatrik: Pendekatan asuhan keperawatan pada lanjut usia. Salemba Medika.

Nutbeam, D., & Lloyd, J. E. (2021). Understanding and Responding to Health Literacy as a Social Determinant of Health. Annual Review of Public Health, 42(1), 159–173. https://doi.org/10.1146/annu rev-publhealth-090419- 102529

Oparil, S., Acelajado, M. C., Bakris, G. L., Berlowitz, D. 2018. Journal of Hypertension, 41(5), 872. https://doi.org/10.1097/HJH. 0000000000003435

Receptor Agonists and SGLT2 Inhibitors in Type 1 Diabetes: A Real-World Study. The Journal of Clinical Endocrinology & Metabolism, 108(4), 920–930 https://doi.org/10.1210/cline m/dgac618

Sheppard, J. P., Benetos, A., & McManus, R. J. (2022). Antihypertensive Deprescribing in Older Adults: A Practical Guide. Current Hypertension Reports, 24(11), 571–580. https://doi.org/10.1007/s11906-022-01215-3

Sheppard, J. P., Benetos, A., Bogaerts, J., Gnjidic, D., & McManus, R. J. (2024).

Stellefson, M., Paige, S. R., Chaney, B. H., & Chaney, J. D. (2020). Evolving Role of Social Media in Health Promotion: Updated Responsibilities for Health Education Specialists. International Journal of Environmental Research and Public Health, 17(4), 1153. https://doi.org/10.3390/ijerph17041153

Strategies for Identifying Patients for Deprescribing of Blood Pressure Medications in Routine Practice: An Evidence

Tirtasari, S., & Kodim, N. (2019). Prevalensi dan karakteristik hipertensi pada usia dewasa muda di Indonesia. 1(5), 395–412.

Tugwell, P., & Tovey, D. (2021). In 2021 When Is It Unethical to Use a Placebo in a Clinical Trial? Journal of Clinical Epidemiology, 133, A5–A6. https://doi.org/10.1016/j.jclinepi.2021.03.023

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 International Society of Hypertension Global Hypertension Practice Guidelines. Hypertension, 75(6),1334–1357. https://doi.org/10.1161/HYPERTENSIONAHA.120.15026

Williams. (2020). 2018 ESC/ESH Guidelines for the management of arterial hypertension. 48(European Heart Journal), 4532–4532.

World Health Organization. (2021). Hypertension. In Https://www.who.int/news-room/factsheet/detail/hypertension. Diakses pada tanggal 6 November 2025

World Health Organization. (2022). Ageing and health. In WHO https://www.who.int/newsroom/fact-sheets/detail/ageing-and-health. Diakses pada tanggal 6 November 2025