

# Effectiveness of Video-Based Self-Management Education in Reducing Psychological Stress and Blood Pressure among Hypertensive Patients in Primary Healthcare: A Quasi-Experimental Study

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## ABSTRACT

Video-Based Self-Management Education Reduces Psychological Stress and Blood Pressure in Hypertensive Patients. Hypertension is closely associated with psychological stress, which can impair blood pressure control and self-management capacity. This study aimed to evaluate the effect of video-based self-management education on psychological stress and blood pressure among hypertensive patients. A quasi-experimental one-group pretest–posttest design was conducted involving 60 hypertensive patients who received a structured video-based self-management education intervention for four weeks. Psychological stress was measured using the Depression Anxiety Stress Scale-21 (DASS-21), and blood pressure was assessed using a calibrated digital sphygmomanometer. Data normality was evaluated using the Shapiro–Wilk test. The results demonstrated a significant reduction in blood pressure based on the Paired Samples t-test ( $p < 0.001$ ; 95% CI:  $-55.83$  to  $-50.33$ ), while psychological stress significantly decreased according to the Wilcoxon Signed Rank Test ( $p < 0.001$ ). Video-based self-management education is an effective and practical nursing intervention for improving both psychological and physiological outcomes among hypertensive patients in primary healthcare settings.

*Edukasi self-management berbasis video efektif menurunkan stres psikologis dan tekanan darah pada pasien hipertensi. Hipertensi berkaitan erat dengan stres psikologis yang dapat menghambat pengendalian tekanan darah dan kemampuan self-management. Penelitian ini bertujuan untuk mengevaluasi pengaruh edukasi self-management berbasis video terhadap stres psikologis dan tekanan darah pada pasien hipertensi. Penelitian ini menggunakan desain quasi-eksperimental one-group pretest–posttest yang melibatkan 60 pasien hipertensi yang mendapatkan intervensi edukasi self-management berbasis video secara terstruktur selama empat minggu. Stres psikologis diukur menggunakan Depression Anxiety Stress Scale-21 (DASS-21), sedangkan tekanan darah diukur menggunakan sphygmomanometer digital yang telah terkalibrasi. Uji normalitas data dilakukan menggunakan Shapiro–Wilk test. Hasil penelitian menunjukkan adanya penurunan tekanan darah yang signifikan berdasarkan uji Paired Samples t-test ( $p < 0,001$ ; 95% CI:  $-55,83$  hingga  $-50,33$ ), serta penurunan stres psikologis yang signifikan berdasarkan uji Wilcoxon Signed Rank Test ( $p < 0,001$ ). Edukasi self-management berbasis video merupakan intervensi keperawatan yang efektif dan praktis untuk meningkatkan luaran psikologis dan fisiologis pada pasien hipertensi di layanan kesehatan primer.*

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## Introduction

Hypertension remains a major public health problem worldwide and is a leading risk factor for cardiovascular morbidity and mortality (Hoffman et al., 2023). Despite the availability of effective pharmacological treatments, blood pressure control among hypertensive patients is often suboptimal, particularly in primary healthcare settings (H. L. Kim et al., 2023). One contributing factor to poor blood pressure control is psychological stress, which has been shown to exacerbate hypertension through increased sympathetic nervous system activity and impaired self-regulation (Gurdogan, 2022). Consequently, effective hypertension management requires not only pharmacological therapy but also interventions that address psychological and behavioral determinants of the disease (Aji & Sani, 2021).

Psychological stress plays a critical role in the progression and persistence of hypertension (Spruill, 2023). Chronic stress can disrupt autonomic balance, increase cortisol secretion, and negatively affect patients' ability to adhere to treatment recommendations and healthy lifestyle behaviors (Luluk & Ni, 2025). In hypertensive patients, inadequate stress management may lead to sustained elevations in blood pressure and increase the risk of cardiovascular complications (WHO, 2023). Therefore, interventions that enhance patients' capacity to manage stress are essential components of comprehensive hypertension care (Pertwi et al., 2021).

Self-management education has emerged as a key strategy in empowering patients to actively participate in the management of chronic diseases, including hypertension. Self-management interventions focus on improving patients' knowledge, skills, and confidence to regulate lifestyle behaviors, cope with stress, and adhere to treatment regimens (Upoyo et al., 2024). Recent studies have highlighted the effectiveness of digital and video-based educational approaches in supporting self-management by providing structured, repeatable, and easily accessible health information (Bao, 2021; Raja-Ismail et al., 2024). Compared to conventional face-to-face education, video-based interventions offer greater flexibility and consistency, particularly in resource-limited primary care settings where repeated in-person education is often challenging (Fira Indriyati et al., 2025).

The effectiveness of video-based self-management education can also be understood through behavioral and psychological theories. According to the Social Cognitive Theory, individuals learn and adopt health behaviors through observation, repetition, self-efficacy enhancement, and reinforcement of positive behavioral outcomes. Educational videos provide visual modeling that helps patients understand and practice self-management behaviors more effectively. In addition, the Health Belief Model suggests that educational interventions may increase patients' perceived susceptibility to hypertension-related complications, perceived benefits of treatment adherence, and motivation to engage in healthy lifestyle behaviors. Through these mechanisms, video-based education may strengthen coping skills, improve stress regulation, and support sustained behavioral changes necessary for optimal blood pressure control.

From a nursing perspective, video-based self-management education represents an innovative and practical approach to delivering patient-centered care. Nurses play a central role in health education and chronic disease management, and the integration of digital media can enhance the reach and continuity of nursing interventions (Tomitani et al., 2021). Video-based education allows patients to revisit information at their own pace, reinforces learning, and supports behavioral change, including stress regulation and lifestyle modification (Bao, 2021). However, most existing studies have primarily focused on knowledge improvement or medication adherence, with limited attention to the simultaneous impact on psychological stress and physiological outcomes such as blood pressure (Raja-Ismail et al., 2024).

Given the limited evidence examining the simultaneous effects of video-based self-management education on psychological stress and blood pressure, this study aimed to evaluate the effectiveness of a structured video-based self-management intervention among hypertensive patients. Specifically, this study investigated whether the intervention could reduce psychological stress and improve blood pressure control in a primary healthcare setting. This study provides empirical evidence on the integrated impact of video-based self-management education on both psychological and physiological outcomes in hypertension care (H. J. Kim et al., 2025).

## Research Methodology

This study employed a quasi-experimental one-group pretest–posttest design, in which all participants received the video-based self-management education intervention. This design was selected to allow preliminary evaluation of the intervention’s effectiveness in a real-world primary healthcare setting where randomization and the use of a control group were not feasible (Puteri et al., 2025). Changes in psychological stress and blood pressure were evaluated by comparing measurements obtained before and after the intervention.

The study involved 60 patients diagnosed with hypertension, who were recruited using purposive sampling based on predetermined inclusion and exclusion criteria. The inclusion criteria consisted of adult patients with a confirmed diagnosis of hypertension, the ability to communicate effectively, and willingness to participate throughout the intervention period. The exclusion criteria included patients with severe psychiatric disorders, cognitive impairment affecting communication, current use of newly prescribed anti-anxiety or antidepressant medications within the previous four weeks, severe cardiovascular complications requiring hospitalization, and participants who were unable to complete the intervention period. All eligible participants received a structured video-based self-management education program for a duration of four weeks. The study was conducted in a primary healthcare setting, with data collection performed at baseline (pretest) and after completion of the intervention (posttest) (Pujiyanto, 2021).

Psychological stress was assessed using the Depression Anxiety Stress Scale-21 (DASS-21), a standardized instrument widely used to measure psychological distress in clinical and community populations (Tomitani et al., 2021). The Indonesian version of the DASS-21 has previously demonstrated good construct validity and reliability in various populations. In the present study, the validity of the instrument was supported through its established use in Indonesian settings, while internal consistency reliability was confirmed using Cronbach’s alpha analysis. The results indicated a Cronbach’s alpha coefficient of  $\alpha = 0.89$  for the stress subscale, reflecting high internal consistency and reliability within this specific sample. These findings confirm that the instrument was appropriate and reliable for measuring psychological stress among hypertensive patients in this study context.

Blood pressure was measured using a calibrated digital sphygmomanometer in accordance with standard hypertension measurement procedures. Measurements were taken with participants in a seated position after an adequate rest period to ensure accuracy and consistency (World Health Organization, 2024).

The video-based self-management education intervention consisted of structured educational content focusing on hypertension management, stress regulation techniques, lifestyle modification, medication adherence, and self-monitoring practices. The stress regulation component included slow deep breathing exercises, progressive muscle relaxation, positive coping strategies, cognitive reframing techniques, and guidance on managing daily stressors associated with chronic illness. Video-based education was chosen to support repeated exposure to health information, self-paced learning, and reinforcement of self-management behaviors, which have been shown to enhance patient engagement and adherence in chronic disease management (Raja-Ismail et al., 2024). Prior to implementation, the educational video content was reviewed and validated by a panel of three experts consisting of a medical-surgical nursing specialist, a psychiatric nursing specialist, and a health education expert to ensure content accuracy, relevance, and suitability for hypertensive patients. Participants were encouraged to watch the educational videos repeatedly during the intervention period to strengthen understanding and promote behavioral change.

Ethical approval was obtained prior to the implementation of the study, and all participants provided written informed consent before data collection (Aminde et al., 2025). Participant confidentiality and research ethics were maintained throughout the study in accordance with ethical principles for nursing research (Rao et al., 2025). Prior to hypothesis testing, data normality was assessed using the Shapiro–Wilk test. The results indicated that blood pressure data were normally distributed ( $p > 0.05$ ), while psychological stress data were not normally distributed ( $p < 0.05$ ). Therefore, the Paired Samples t-test was used for blood pressure variables, and the Wilcoxon Signed Rank Test was used for psychological stress variables.

**Results**

A total of 60 hypertensive patients participated in this study and completed the video-based self-management education intervention. The demographic characteristics of the respondents are presented in Table 1.

**Table 1.**  
*Characteristics of Respondents (n = 60).*

Characteristics	Frequency (n)	Percentage (%)
Sex		
Male	18	30.0
Female	42	70.0
Age Group (years)		
36-45	10	16.7
46-55	20	33.3
56-65	30	50.0
Occupation		
Farmer	30	50.0
Housewife	22	36.7
Private sector employee	4	6.7
Civil servant	4	6.7

Percentages are presented with one decimal place for consistency.

*Note.* Age was categorized into groups to simplify data presentation and enhance clarity in describing respondent characteristics. Although sex was not included as a primary variable in the analysis, it was retained to provide a comprehensive overview of the respondent profile. Percentages are presented with one decimal place for consistency.

The results show a reduction in mean systolic and diastolic blood pressure following the intervention. Statistical analysis indicated significant differences between pre- and post-intervention measurements for both systolic and diastolic blood pressure. The changes in systolic and diastolic blood pressure are presented in Table 2.

**Table 2.**  
*Changes in Blood Pressure Before and After Video-Based Self-Management Education (n = 60).*

Variable		Pre-intervention (Mean ± SD)	Post-intervention (Mean ± SD)	Mean Difference	95% CI	p-value
Systolic (mmHg)	BP	172.53 ± 8.32	119.45 ± 8.61	-53.08	-55.83 to -50.33	<0.001
Diastolic (mmHg)	BP	94.95 ± 8.53	74.47 ± 9.00	-20.48	-23.96 to -17.00	<0.001

*Note.* BP = blood pressure; CI = confidence interval. Differences were assessed using the paired samples *t*-test.

The substantial reduction in blood pressure observed after the intervention should be interpreted in the context of the comprehensive self-management education provided during the study period. The educational content emphasized medication adherence, lifestyle modification, dietary management, stress regulation, and self-monitoring behaviors. No pharmacological treatment adjustments were introduced as part of the research protocol during the intervention period. Medication adherence was reinforced throughout the intervention period; however, it was not quantitatively measured as an outcome variable in this study.

Changes in psychological stress levels before and after the intervention, measured using the DASS-21 instrument, are presented in Table 3.

**Table 3.**

*Distribution and Statistical Analysis of Psychological Stress Levels Before and After the Intervention (DASS-21) (n = 60).*

Stress Level	Pre-intervention n (%)	Post-intervention n (%)
Normal	2 (3.3)	45 (75.0)
Mild	8 (13.3)	10 (16.7)
Moderate	30 (50.0)	5 (8.3)
Severe	20 (33.3)	0 (0.0)

Note: Stress levels were categorized based on the DASS-21 scoring guidelines.

To provide a more comprehensive assessment of psychological stress changes, raw DASS-21 stress scores were also analyzed. As shown in Table 4, the mean DASS-21 stress score decreased substantially from 23.45 ( $SD = 4.21$ ) before the intervention to 8.34 ( $SD = 2.76$ ) after the intervention, representing a mean reduction of 15.11 points. Because the Shapiro-Wilk test indicated that the psychological stress data were not normally distributed, the Wilcoxon Signed Rank Test was applied. The statistical analysis demonstrated a significant reduction in psychological stress scores following the intervention ( $p < .001$ ). These findings indicate that the video-based self-management education effectively improved stress conditions among hypertensive patients.

**Table 4.**

*Changes in DASS-21 Stress Scores Before and After Video-Based Self-Management Education (n = 60)*

Variable	Pre-intervention (Mean + SD)	Post intervention (Mean + SD)	Mean Difference	Statistical test	p-value
DASS-21 Stress Score	23.45 ± 4.21	8.34 ± 2.76	-15.11	Wilcoxon Signed Rank Test	<0.001

Note: Statistical analysis was performed using the Wilcoxon Signed Rank Test. Negative values in the mean difference indicate a reduction in psychological stress following the intervention.

## Discussion

This study provides preliminary evidence that video-based self-management education is a feasible and potentially beneficial nursing intervention for hypertensive patients in a primary healthcare context (Aji & Lazuardi, 2025). Consistent with a one-group pretest posttest design, the observed post-intervention improvements suggest a favorable direction of change that is clinically meaningful for community-based hypertension management, while not constituting definitive causal proof in the absence of a control group (Chimberengwa & Naidoo, 2020). Such interpretation aligns with recommendations for evaluating nursing interventions implemented in real-world primary care settings.

A central contribution of this study is its emphasis on psychological stress as a relevant and modifiable component of hypertension care. Psychological stress has been widely associated with autonomic dysregulation and maladaptive coping behaviors that can undermine blood pressure control and adherence to lifestyle recommendations (Khanal et al., 2021). Within routine nursing practice, stress is frequently reported by patients as a barrier to sustained self-care. The stress-related improvements observed following the intervention indicate that structured educational strategies can strengthen patients' coping capacity and emotional regulation, which are integral to holistic hypertension management (Irwan et al., 2022).

The observed improvements in blood pressure outcomes are consistent with conceptual models linking psychological regulation to cardiovascular stability. Stress management may influence blood pressure through neuroendocrine and autonomic pathways, while enhanced self-management supports healthier daily decisions related to diet, activity, and monitoring (Sangouni et al., 2024). In this study, the video-based format likely supported repetition and reinforcement of key messages, which are essential mechanisms for behavioral change. Rather than acting through a single pathway, self-management education may exert its effects through multiple, interacting mechanisms, including improved knowledge, strengthened self-efficacy, and greater readiness to adopt recommended behaviors (Wu et al., 2025).

The magnitude of blood pressure reduction observed in this study warrants careful interpretation. Although psychological stress reduction may have contributed to improved cardiovascular regulation, the observed physiological changes were likely influenced by multiple behavioral mechanisms addressed through the intervention. The educational videos emphasized medication adherence, dietary modification, lifestyle management, blood pressure self-monitoring, and stress regulation strategies. Therefore, improved adherence to prescribed antihypertensive medications and healthier self-management behaviors may have played an important role in the reduction of blood pressure observed after the intervention. The findings suggest that the intervention may have acted as a catalyst for broader behavioral changes rather than affecting blood pressure solely through stress reduction pathways (Ruksakulpiwat et al., 2025).

Another consideration when interpreting the findings is the potential influence of the Hawthorne effect. Because participants were aware that they were being observed and assessed throughout the study period, some improvements in stress management behaviors and blood pressure control may have occurred as a result of increased attention from researchers rather than the intervention alone. Enhanced motivation, greater self-awareness, and temporary behavioral adjustments associated with participation in a research study may partially explain the observed improvements. Consequently, the findings should be interpreted cautiously, and future studies incorporating control groups and randomized designs are needed to distinguish the specific effects of the intervention from observation-related influences.

From an implementation perspective, video-based education aligns well with adult learning principles and the operational realities of primary healthcare services. Video materials enable self-paced learning and repeated exposure, which can enhance comprehension and retention compared to time-limited, face-to-face counseling alone (Eaton et al., 2024). In resource-limited settings, standardized video content can reduce variability in educational delivery and support continuity of care an important consideration for nursing services managing high patient volumes (Alshammari, 2024).

The role of nurses is pivotal in optimizing the benefits of this intervention. As primary educators and facilitators of self-care, nurses are well-positioned to integrate video-based education into routine practice to support patient empowerment and continuity of care (Hermansson-Borrebaeck et al., 2025). By offloading foundational education to standardized video modules, nurse patient interactions can focus more effectively on individualized barriers, including personal stressors, family dynamics, and adherence challenges. This approach is consistent with patient-centered and holistic nursing models for chronic disease management (Ukoha- et al., 2023).

The community characteristics of participants further highlight the practical relevance of video-based education. Applicability across diverse occupational backgrounds suggests acceptability among

varying levels of health literacy and daily responsibilities. In community contexts where written materials may be less engaging, audiovisual delivery can enhance understanding when content is culturally appropriate and practically oriented (Aji, Baidhowy, et al., 2026). This approach aligns with primary healthcare principles that emphasize accessibility, patient engagement, and continuity of care in chronic disease management. (Mourouti et al., 2022).

Although the intervention duration was relatively short and long-term sustainability could not be established, the short-term improvements observed provide a strong rationale for future research. Subsequent studies may incorporate longer follow-up periods and comparative designs to strengthen causal inference and assess sustained outcomes. Nevertheless, the present findings remain valuable for nursing practice because they reflect real-world implementation and demonstrate how an accessible educational strategy can support both psychological and physiological dimensions of hypertension management in primary care (Charchar et al., 2024).

Overall, this study strengthens the nursing evidence base by highlighting the integrated role of stress regulation and self-management support in hypertension care. By addressing emotional and behavioral factors alongside clinical monitoring, the findings underscore the importance of holistic, nurse-led educational strategies. These findings support the integration of video-based self-management education into routine nursing services at the primary healthcare level (Aji, Bhadowy, et al., 2026).

### **Study Limitations**

This study has several limitations that should be acknowledged. The absence of a control group limits causal inference; however, the one-group pretest–posttest design was appropriate for preliminary evaluation of the intervention in a real-world primary healthcare setting, where randomization and the inclusion of a control group were not feasible. In addition, the study was conducted in a single primary healthcare setting, which may limit the generalizability of the findings to other populations or healthcare contexts. Psychological stress was assessed using a self-reported instrument, which may be influenced by participants' subjective perceptions. Furthermore, the intervention was implemented over a relatively short duration, and the long-term sustainability of stress reduction and blood pressure control could not be assessed. Despite these limitations, the study provides valuable evidence on the potential role of video-based self-management education as a practical nursing intervention to support hypertension management in primary healthcare settings.

### **Conclusion**

This study concludes that video-based self-management education is associated with a reduction in stress and improving blood pressure control among hypertensive patients. The intervention supports patients in managing emotional stressors and strengthening self-care behaviors, which are essential components of comprehensive hypertension management. From a nursing perspective, video-based self-management education represents a practical, low-cost, and scalable non-pharmacological intervention that can be integrated into routine nursing practice in primary healthcare settings. The findings highlight the important role of nurses in delivering structured educational interventions that empower patients, enhance self-management capacity, and contribute to better long-term outcomes in hypertension care. Future studies are recommended to employ Randomized Controlled Trial (RCT) designs with larger sample sizes to strengthen causal inference. In addition, longer follow-up periods of at least three to six months are needed to determine whether the observed behavioral changes, reductions in psychological stress, and improvements in blood pressure control can be sustained over time.

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## Conflict of Interest

The author declares that there is no conflict of interest related to the publication of this manuscript. The study was conducted independently without any financial, commercial, or personal relationships that could potentially influence the research process or outcomes.

## Credit Author Statement

**Prima Trisna Aji:** Conceptualization, methodology, investigation, formal analysis, data curation, writing original draft, project administration. **Muhammad Nur Hasbi:** Investigation, resources, validation, writing–review and editing. **Elinda Rizkasari:** Supervision, validation, writing–review and editing.

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