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Innovation and Development of Mind Mapping Video as a Health Education Medium to Improve Self-Management Behavior in Hypertension

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ABSTRACT

Background: Health education plays an important role in helping individuals overcome health problems, particularly in managing chronic diseases such as hypertension. **Object:** This study aims to develop and evaluate the feasibility of a Mind Mapping Video as an innovative health education medium to improve Hypertension Self-Management Behaviors (HSMB) among individuals with hypertension. **Methode:** This research employed a Research and Development (R&D) design using the 4D model (Define, Design, Develop, Disseminate). Validation was conducted by media and material experts, followed by a trial involving 10 respondents and field implementation with 30 hypertension patients at the Martapura Timur Community Health Center. **Results:** Expert validation results indicated that the media was feasible for use (85%), while the user trial yielded an average score of 32.20 (categorized as highly feasible). **Conclusion:** The Mind Mapping Video is considered effective as an engaging and easily understandable health education medium that enhances comprehension and motivation in hypertension self-management behaviors.

Keywords: Hypertension, Health Education, Mind Mapping Video, Self-management Behavior

BACKGROUND

Hypertension is one of the major global health problems, affecting approximately 1.28 billion adults aged 30–79 years worldwide (Morgado et al., 2024). This disease often shows no symptoms in its early stages. The risk of hypertension is influenced by unhealthy eating habits and lack of physical activity (Mahdalena et al., 2024, 2023). Uncontrolled hypertension can lead to serious complications such as stroke, heart disease, and kidney disorders if not properly managed. In Indonesia, the prevalence of hypertension among adults aged ≥18 years reaches 34.1% (Ukoha-Kalu et al., 2023). Low awareness and the lack of effective educational media remain major challenges in controlling this disease.

Health education requires media that are engaging, easily accessible, and tailored to the characteristics of the target population. Mind Mapping is a visualization method that helps individuals understand concepts through the systematic organization of key ideas (Mayer, 2012). Meanwhile, video media has been shown to increase audience engagement and comprehension of health materials (Hansen et al., 2024). The combination of both, in the form of a Mind Mapping Video, is expected to create an interactive and memorable learning process, especially for communities with lower educational levels.

This study aims to develop a Mind Mapping Video medium and evaluate its feasibility as well as user responses

regarding its use as a health education medium for individuals with hypertension.

RESEARCH METHODS

This study employed a Research and Development (R&D) method using the 4D model, which consists of four stages: Define, Design, Develop, and Disseminate (Deshpande et al., 2023).

Define Stage

A needs analysis was conducted through interviews and observations involving hypertension patients and healthcare workers at the Martapura Timur Community Health Center. The results showed that most patients had limited knowledge regarding hypertension management and demonstrated low adherence to treatment.

Design Stage

The Mind Mapping Video media was designed using Canva and CapCut applications. The video contains a concept map illustrating the definition, risk factors, signs and symptoms, complications, and management strategies of hypertension. The design is complemented with voice narration and animations to make the material easier to understand.

Develop Stage

The media was validated by media experts and material experts using a Likert scale questionnaire. A trial was conducted with 10 community respondents to assess the practicality and attractiveness of the media.

Disseminate Stage

The revised media was uploaded to the YouTube platform to ensure easy access for the wider community. A field trial was conducted involving 30 hypertension patients within the working area of the Martapura Timur Community Health Center.

The second stage

The second stage used a quantitative research design with a pre-experimental approach, applying the one-group pretest–posttest design method. The study was conducted in the working area of the Martapura Timur Community Health Center, with data collection carried out over three weeks during April–May 2024. The sampling technique employed was non-probability sampling, specifically purposive sampling. Samples were selected based on inclusion and exclusion criteria. Inclusion criteria included owning a smartphone, being aged 20–49 years, having no hearing or visual impairments, being conscious, cooperative, and able to communicate well. Exclusion criteria included having memory impairment, being pregnant, and having mental disorders

RESULT AND DISCUSSION

The design of the Mind Mapping Video was created using the Canva and CapCut software applications. The resulting design is presented as follows.

Figure 1. Opening
Source: https://www.capcut.com, 2024

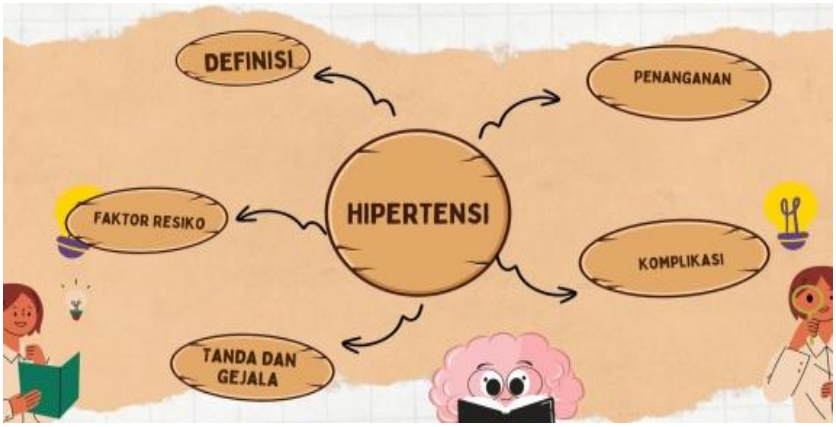

Figure 2. Mind Mapping Hypertension

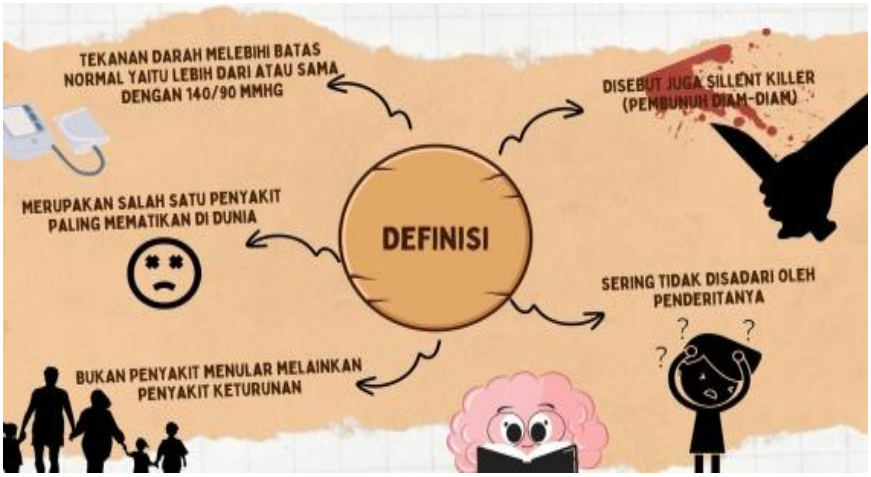

Figure 3. Definition of Hypertension

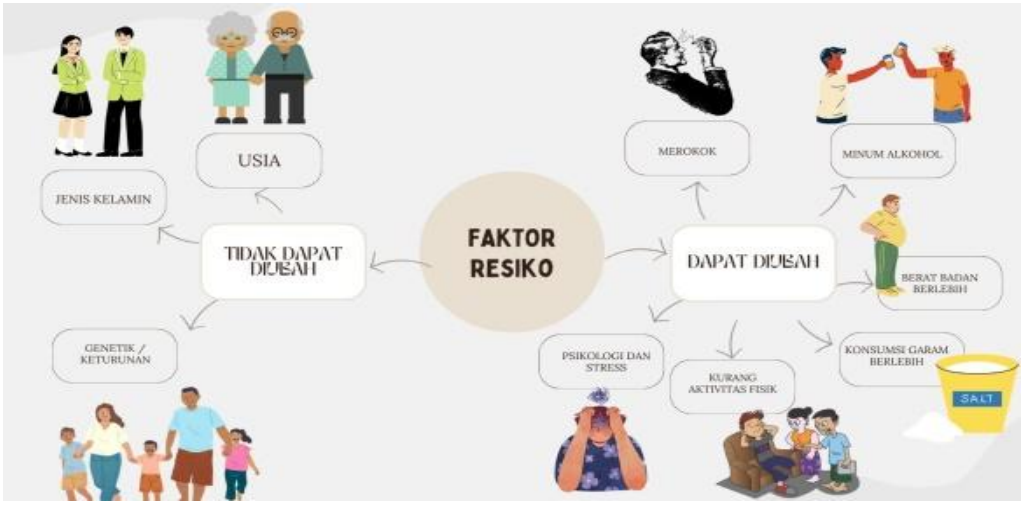

Figure 4. Risk Factors of Hypertension

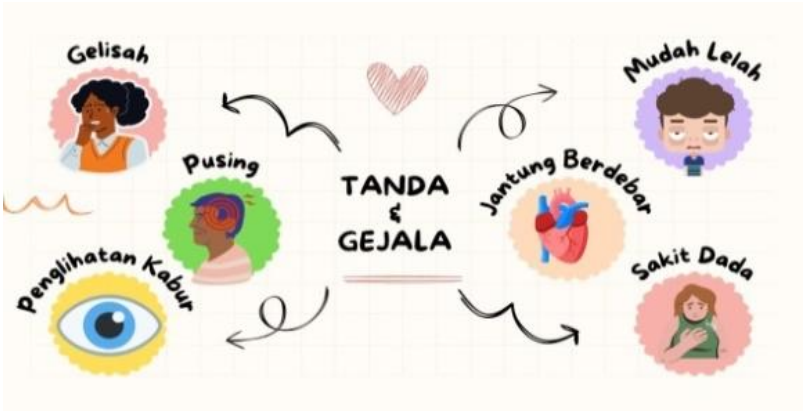

Figure 5. Signs and Symptoms of Hypertension

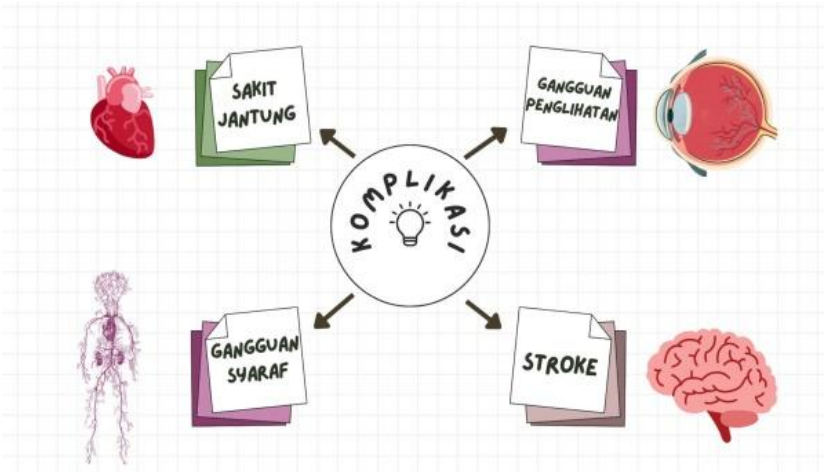

Figure 6. Complications of Hypertension

Figure 7. Management (Self-Management)

Figure 8. Closing

Expert validation results showed an average score of 85% (categorized as highly feasible), covering aspects of content feasibility, design appearance, and ease of use. A media trial was conducted with 10 lay community members in the Martapura 1 Community Health Center area. Trial data were obtained by providing an instrument and explaining the function and content of the Mind Mapping Video. The trial results are presented in Table 1.

Table 1.

Product Trial Result

Media Questionnaire	Level of Feasibility	Frequency	Percentage
Trial Test	Very feasible (31-40)	7	70%
	Feasible (21-30)	3	30%
	Not feasible (10-20)	0	0%
Mean= 32.20, SD = 2.150			

Table 1 shows that the feasibility of the Mind Mapping Video, based on the trial results, obtained an average score of 32.20 from 10 respondents. This score fell within the range of 31–40 (highly feasible), indicating that the Mind Mapping Video was highly suitable for use as a health education medium. The effectiveness test results on Hypertension Self-Management Behavior (HSMB) among hypertension patients before and after receiving health education using the Mind Mapping Video are presented below.

Table 2.

Self-Management Ability of Hypertension Patients Before and After Receiving Health Education Using Mind Mapping Video in the Martapura Timur Community Health Center

Self Management	*Pretest*		*Posttest*	
	Frequency	**percentage**	**Frequency**	**percentage**
Good (121-160	0	0%	3	10%
Fair (81-120)	28	93,3%	27	90%
Poor (40-80)	2	6,7%	0	0%

In the field effectiveness trial, the average HSMB score increased from 97.50 to 110.20, with a significance value of p = 0.000, indicating a significant difference before and after the intervention. Participants also reported an increase in motivation to monitor blood pressure regularly, adhere to medication, and adopt a healthier lifestyle.

Discussion

The results of this study showed that the Mind Mapping Video was both content- and technically feasible (expert validation = 85%) and was well accepted by users (trial mean = 32.20). In addition, there was an improvement in participants' Hypertension Self-Management Behavior (HSMB) scores after the intervention (average increased from 97.50 to 110.20; Wilcoxon test p = 0.000). These findings can be explained through several relevant theoretical and empirical aspects: the multimedia learning mechanism, the proven effectiveness of video as a health education tool, the role of visualization (mind mapping) in facilitating understanding, and the integration of behavior change techniques that support the adoption of new health behaviors (Moe-Byrne et al., 2022).

The conceptual design of the Mind Mapping Video aligns with Mayer's Cognitive Theory of Multimedia Learning (CTML), which posits that presenting information through words (narration/text) and images (mind maps/animations) promotes the formation of coherent mental representations when cognitive load is properly managed. The CTML principles—such as modality, coherence, signaling, and segmenting—help explain why the combination of audio and visual elements, structured as a map of ideas, facilitates the understanding of complex concepts like hypertension and self-management strategies. The video design, which breaks the content into short segments, provides visual and auditory signals, and minimizes irrelevant information, is likely to enhance participants' generative processing and overall comprehension (Polsook & Aungsuroch, 2024).

Several systematic reviews and empirical studies have shown that videos (including animations) are effective in improving patient knowledge, information recall, and, in some cases, health behaviors—especially when the videos are designed based on multimedia learning principles and tailored to the target audience. Recent meta-analyses and systematic reviews have reported positive effects on learning outcomes and behavioral changes, although results remain heterogeneous depending on intervention duration, design quality, and implementation context. The findings of this study—specifically the improvement in HSMB scores—are consistent with existing evidence showing that audiovisual

interventions can enhance patient understanding and adherence in the management of chronic diseases (Brewer et al., 2023; Fitriani et al., 2024).

Mind mapping facilitates the organization of information by placing the main concept as a central node and linking sub-concepts radially—a structure that enhances the understanding of relationships between ideas and aids memory retrieval. Educational literature indicates that mind maps and concept maps can improve comprehension and the ability to organize knowledge, particularly for complexly structured concepts such as chronic diseases (Sumilang, 2019). The combination of mind mapping and video is likely to strengthen this effect: the mind map provides the structural framework, while animation and narration offer clarity of flow and structured repetition. This explains why audiences with varying literacy levels can effectively understand the material (Smith & Lee, 2021).

Changes in self-management behaviors—such as adopting a low-salt diet, adhering to medication, monitoring blood pressure, and engaging in physical activity—are more likely to occur when education incorporates reinforcement techniques such as goal setting, self-monitoring, feedback, and cues to action. A video that includes practical components (e.g., demonstrations, monitoring steps, and implementation tips) and encourages repeated viewing can serve as a prompt to reinforce routine practices. Moreover, integrating the video with healthcare provider support (e.g., follow-up) or other digital media (such as mHealth applications or reminder messages) has often shown synergistic effects on blood pressure control. Therefore, the observed improvement in HSMB is likely the result of a combination of enhanced understanding (knowledge gain) and implementation stimulus provided through replayable audiovisual materials (Shaemil, 2021; Sumilang, 2019).

Relevance of Evidence in the Context of Primary Care and Adult Populations in Indonesia

The results of the field trial, with a sample consisting mostly of women aged 40–49 and senior high school education, indicate that the Mind Mapping Video is well accepted by demographic groups that often serve as target audiences for health promotion programs in community health centers. In the Indonesian context, where smartphone-based internet access is becoming increasingly widespread, distributing the video through public platforms (e.g., YouTube) allows broad reach and independent message repetition—both are essential for public health interventions. However, differences in access and digital literacy among groups should be carefully considered (Çeken & Taşkın, 2022).

Strengths of the Study

Integration of a systematic R&D (4D) process — from needs analysis, design, expert validation, user testing, to field trials — provides strong justification for the product's feasibility and scientific rigor. A combination of two complementary approaches — conceptual visualization and audiovisual presentation — represents a practical innovation for non-communicable disease education. Use of structured instruments (HSMBQ) and statistical analysis (Wilcoxon test) — provides quantitative evidence of behavioral change following the intervention.

Research Implications:

1. Integrate the Mind Mapping Video into community health center education packages as supporting material for counseling sessions (combined with interactive discussions and referrals to healthcare professionals for personalized guidance).

2. To strengthen behavioral effects, consider combining the video with additional Behavior Change Technique (BCT) components such as scheduled reminders (SMS/WhatsApp), community support groups, or integration into blood pressure monitoring apps. Evidence from mHealth studies indicates that such combinations are more effective in reducing blood pressure (Zhou et al., 2024).
3. Conduct a Randomized Controlled Trial (RCT) with measured blood pressure as the primary outcome and medium-term follow-up (6–12 months) to evaluate the clinical effectiveness and behavioral durability of the intervention.
4. Adapt the content to local culture and literacy levels by using local language, contextual examples, and ensuring accessibility features (such as subtitles, optimal duration, and small file sizes) for low-bandwidth environments.

Research limitations:

1. The pre-experimental one-group pretest–posttest design does not control for history, maturation, or other external factors; without a control group, it is difficult to attribute changes exclusively to the intervention. A follow-up Randomized Controlled Trial (RCT) is needed to confirm causal effects.
2. The relatively small sample size (N=30) and single-site setting (Martapura Timur Community Health Center) limit the generalizability of the findings to broader populations.
3. The self-reported behavior measurements are susceptible to social desirability bias; future studies should include objective indicators (e.g., measured blood pressure, medication refill rates) to enhance validity.
4. The lack of long-term follow-up makes it unclear whether the improvement in HSMB is sustained over time. Evidence from digital intervention studies suggests that early effects may diminish without ongoing reinforcement (Leontyeva et al., 2021).

Conclusions

The Mind Mapping Video has been proven effective in improving self-management behavior among individuals with hypertension. This medium is feasible for implementation in health education programs within primary care settings, as it is accessible, engaging, and capable of enhancing patients' understanding, motivation, and adherence to hypertension management.

REFERENCES

Brewer, L. C., Jones, C., Slusser, J. P., Pasha, M., Lalika, M., Chacon, M., Takawira, P., Shanedling, S., Erickson, P., Woods, C., Krogman, A., Ferdinand, D., Underwood, P., Cooper, L. A., Patten, C. A., & Hayes, S. N. (2023). Health Intervention for Promoting Hypertension Self-Management. *JMIR Form Res.*, *7*.

Çeken, B., & Taşkın, N. (2022). Multimedia learning principles in different learning environments: a systematic review. *Smart Learning Environments*, *9*(1). https://doi.org/10.1186/s40561-022-00200-2

Deshpande, N., Wu, M., Kelly, C., Woodrick, N., Werner, D. A., Volerman, A., & Press, V. G. (2023). Video-Based Educational Interventions for Patients With Chronic Disease. *JMIR Publications*, *25*.

Fitriani, J. N., Rohmawati, D. L., & Lukitaningtyas, D. (2024). The Level of Knowledge and Self-Management is Related to the Quality of Life of Hypertensive Patients. *Proc Int Conf Nurs Health Sci*, *5*(1).

Hansen, S., Jensen, T. S., Schmidt, A. M., Strøm, J., Vistisen, P., & Høybye, M.

T. (2024). The Effectiveness of Video Animations as a Tool to Improve Health Information Recall for Patients: Systematic Review. *Journal of Medical Internet Research*, *26*. https://doi.org/10.2196/58306

Leontyeva, I., Pronkin, N., & Tsvetkova, M. (2021). Visualization of Learning and Memorization: Mind Mapping. *International Journal of Instruction*, *14*(4), 173–186.

Mahdalena, M., Kutbi, M. A., & Ningsih, E. S. P. (2023). Literature Review Pengaruh Gaya Hidup Masyarakat Perkotaan Terhadap Kejadian Hipertensi. *Jurnal Skala Kesehatan*, *14*(1), 84–94. https://doi.org/10.31964/jsk.v14i1.387

Mahdalena, Mahpolah, Suroto, Aina Fahrunisa, & Vitha Amalya Maharani. (2024). Hypertension in Riverside Communities. *Evolutionary Studies in Imaginative Culture*, 1481–1485. https://doi.org/10.70082/esiculture.vi.1413

Mayer, R. E. (2012). Cognitive Theory of Multimedia Learning. *The Cambridge Handbook of Multimedia Learning*, 31–48. https://doi.org/10.1017/cbo9780511816819.004

Moe-Byrne, T., Evans, E., Benhebil, N., & Knapp, P. (2022). The effectiveness of video animations as information tools for patients and the general public: A systematic review. *Front Digital Healt*, *4*.

Morgado, M., Botelho, J., Machado, V., Mendes, J. J., Adesope, O., & Proença, L. (2024). Video-based approaches in health education: a systematic review. *Scientific Reports (Nature Research)*, *14*(1).

Polsook, R., & Aungsuroch, Y. (2024). The effect of a self-management programme on blood pressure levels among people with hypertension: a randomised controlled trial. *Journal of Research in Nursing*, *29*(6).

Shaemil, D. P. P. (2021). *Pengaruh Pendidikan Kesehatan Dengan Media Audiovisual Terhadap Self Management*.

Smith, J., & Lee, A. (2021). Digital Health Interventions for Hypertension Management: A Systematic Review. *Journal of Telemedicine and Telecare*, *27*(5), 309–316.

Sumilang, C. A. (2019). mHealth Interventions for Self-Management of Chronic Disease. *JMIR MHealth UHealth*, 88–127. https://doi.org/10.4018/978-1-5225-9351-5.ch004

Ukoha-Kalu, O., Isah, A., Biambo, A. A., Samaila, A., Abubakar, M. M., & Kalu, U. A. (2023). Effectiveness of educational interventions on hypertensive patients' self-management behaviours: an umbrella review protocol. *BMJ Open*, *13*(8).

Zhou, Y., Li, S.-J., Huang, R.-Q., Ma, H.-M., Wang, A.-Q., Tang, X.-Y., Pei, R.-Y., & Piao, M.-H. (2024). Behavior Change Techniques Used in Self-Management Interventions Based on mHealth Apps for Adults With Hypertension: Systematic Review and Meta-Analysis of Randomized Controlled Trials. *J Med Internet Research*, *26*.