

Using animated health promotion videos to reduce smoking and anxiety in hypertensive patients: a quasi-experimental study

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Abstract

Smoking and anxiety are significant modifiable risk factors that contribute to the worsening of hypertension. Health promotion using engaging media such as animated videos has the potential to enhance patients' understanding and motivation to change risky behaviors. This study aimed to examine the effectiveness of

animated health promotion videos in reducing smoking behavior and anxiety levels among patients with hypertension. A quasi-experimental study was conducted from March to June 2024 at Ar-Rasyid General Hospital, Palembang. A total of 110 hypertensive patients who smoked were selected using purposive sampling and divided into intervention and control groups. The intervention group received animated video-based health education sessions focusing on smoking cessation and anxiety management, delivered over four weeks. The control group received standard care. Smoking behavior was assessed using a structured smoking behavior questionnaire, while anxiety levels were measured using the Hamilton Anxiety Rating Scale (HARS). Data were analyzed using paired and independent t-tests. The intervention group showed a significant reduction in both smoking behavior scores and anxiety levels compared to the control group ($p < 0.05$). The mean reduction in anxiety scores was greater in the intervention group, indicating the effectiveness of animated videos in promoting behavioral and psychological improvements. Animated health promotion videos are effective in reducing smoking and anxiety among hypertensive patients. This approach can be considered an innovative and accessible health education strategy to support hypertension management.

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Introduction

Hypertension, or elevated blood pressure, is a chronic medical condition and a leading contributor to global morbidity and mortality. It significantly increases the risk of cardiovascular disease, stroke, chronic kidney disease, and other Non-Communicable Diseases (NCDs).¹ According to the World Health Organization,² an estimated 1.28 billion adults aged 30–79 years are living with hypertension worldwide, yet approximately 46% remain undiagnosed and untreated. The burden is disproportionately higher in Low- and Middle-Income Countries (LMICs), where healthcare access and health literacy are often limited. In the Asia-Pacific region, the prevalence of hypertension continues to rise due to urbanization, sedentary lifestyles, unhealthy dietary patterns, stress, and population aging.^{3,4} In Indonesia, the Basic Health Research (Riskesdas) 2018 reported a national hypertension prevalence of 34.1%, with South Sumatra slightly higher at 35.2%.^{5,6} Local data from Ar-Rasyid General Hospital in Palembang indicate that hypertension consistently ranks among the top five outpatient diagnoses, highlighting an urgent need for targeted prevention and control strategies at the community and institutional levels.

One of the major modifiable risk factors that contributes to both the development and progression of hypertension is smoking.^{7,8} The toxic constituents of tobacco, particularly nicotine, induce vasoconstriction, increase arterial stiffness, elevate

sympathetic nervous activity, and ultimately raise blood pressure levels.⁸⁻¹⁰ Chronic smoking damages the vascular endothelium and exacerbates inflammatory processes, further amplifying cardiovascular risk in hypertensive individuals.^{12,13} Beyond its physiological effects, smoking behavior is often intertwined with psychological distress, especially among patients with chronic illnesses.¹⁴ Anxiety, in particular, is prevalent among individuals with hypertension and has been shown to disrupt blood pressure control, reduce adherence to medication and lifestyle recommendations, and increase health-compromising behaviors such as tobacco use.^{14,15} This bidirectional relationship between hypertension and anxiety represents a significant challenge in clinical management, necessitating holistic and integrative approaches.

Effective hypertension control requires a comprehensive strategy that combines pharmacological therapy with behavioral interventions, psychosocial support, and patient education.¹⁷ Health promotion plays a vital role in increasing awareness, fostering behavioral change, and improving self-management capabilities. However, conventional methods of education, such as verbal counseling or printed materials, often have limited impact, particularly in populations with low health literacy or poor engagement. In response to this, digital health technologies have gained momentum, with animated health promotion videos emerging as a powerful tool to convey complex health information in an engaging and easily digestible format. These videos utilize visual storytelling, motion graphics, and voiceovers to reinforce learning, promote motivation, and enhance patient empowerment.^{17,18}

Numerous studies have demonstrated the efficacy of multimedia-based interventions in chronic disease education. For example, animated videos have been shown to significantly improve knowledge retention, enhance motivation to quit smoking, and reduce anxiety by increasing self-efficacy and emotional engagement.¹⁹⁻²¹ In the context of hypertension, video-based education has also been associated with improved medication adherence and lifestyle modification.^{23,24} Despite these promising findings, research that evaluates the simultaneous impact of animated videos on both smoking cessation and anxiety reduction among hypertensive patients remains scarce. This gap in the literature highlights the need for context-specific, evidence-based studies to optimize health promotion strategies in hypertensive populations, particularly those at high risk due to behavioral and psychological comorbidities.

A preliminary assessment conducted at Ar-Rasyid General Hospital in March 2024 through direct interviews and clinical observation found that many hypertensive patients continued smoking despite repeated verbal counseling and demonstrated moderate to high levels of anxiety. This situation reflects a disconnect between traditional education methods and patient engagement. Considering the high prevalence of hypertension and its associated psychosocial and behavioral risk factors in this setting, innovative interventions are essential. Thus, this study aims to examine the effectiveness of animated health promotion videos in reducing smoking behavior and anxiety among hypertensive patients. It is anticipated that the findings will support the integration of digital health tools into patient education frameworks and contribute to the advancement of holistic hypertension management in clinical practice.

Materials and Methods

Study design and setting

This study employed a quasi-experimental design using a pretest-posttest control group approach to assess the effectiveness of animated health promotion videos in reducing smoking behavior and anxiety levels among hypertensive patients. The intervention was implemented over a four-month period, from March to June 2024, at Ar-Rasyid General Hospital in Palembang, Indonesia. As a secondary referral healthcare facility, Ar-Rasyid General Hospital offers a comprehensive spectrum of services, including specialized care for chronic conditions such as hypertension. The site was purposively selected due to hospital records indicating a substantial proportion of hypertensive patients who are also active smokers a high-risk group that stands to benefit significantly from targeted behavioral interventions. The use of multimedia tools such as animated videos has been shown in prior studies to enhance patient engagement, improve comprehension, and facilitate behavior change in clinical populations.²⁵ Given the dual burden of smoking and anxiety in individuals with chronic illness, this setting provided an ideal environment for testing a low-cost, scalable health education strategy.

Population and sampling

The study population consisted of adult patients diagnosed with hypertension who were current smokers and regularly attended the internal medicine outpatient clinic. Participants were selected through purposive sampling using the following inclusion criteria: aged between 30 and 70 years; diagnosed with hypertension for a minimum of six months; actively smoking at least one cigarette per day during the past month; cognitively and physically capable of participating in the intervention; and willing to provide written informed consent. Exclusion criteria included a history of severe psychiatric disorders, cognitive impairment, or comorbid medical conditions requiring intensive treatment or hospitalization. A total of 110 eligible participants were recruited and then equally divided into two groups using a non-randomized, sequential allocation method: 55 participants were assigned to the intervention group and 55 to the control group. This balanced allocation helped ensure baseline comparability and enhanced the statistical power needed to detect significant differences between groups.

Intervention procedure

The intervention group received a structured, culturally adapted health education program delivered via animated video sessions over a four-week period. Each weekly session lasted approximately 10–15 minutes a duration strategically selected based on formative research and supported by literature highlighting the effectiveness of brief, focused multimedia content in maintaining attention and enhancing information retention among adult learners.¹⁸ This four-week timeline was intentionally designed to balance sufficient educational exposure with the practical demands of integrating such interventions into routine clinical settings. The video modules, developed specifically for hypertensive smokers, contained evidence-based content addressing the health risks of smoking, the physiological effects of nicotine on blood pressure, and effective smoking cessation strategies. They also incorporated anxiety-reduction techniques such as deep breathing and progressive muscle relaxation, alongside motivational components rooted in Cognitive-Behavioral Therapy (CBT). To ensure clinical accuracy,

cultural relevance, and user engagement, the modules were collaboratively produced with input from healthcare professionals, health communication experts, and animation specialists, making them accessible to individuals with diverse levels of health literacy. To ensure methodological rigor and minimize potential bias, several control strategies were systematically implemented. Participants were randomly allocated to intervention and control groups using a computer-generated sequence to reduce selection bias, while outcome assessors were blinded to group assignments to minimize detection bias. Intervention sessions were delivered by trained nurses using a standardized protocol to ensure consistency and were conducted individually or in small groups within quiet, private counseling rooms to limit distractions and enhance focus. Each session concluded with a structured reflective discussion, reinforcing key messages and encouraging participant engagement an approach that supported the development of self-efficacy and motivation to change, both critical elements in behavior modification frameworks. In contrast, the control group received standard care according to institutional protocols, including routine medical consultations, antihypertensive pharmacotherapy, and general verbal advice on smoking and lifestyle changes. All participants across both groups continued their prescribed antihypertensive medications throughout the study to ensure uniformity in medical treatment, allowing for clearer attribution of outcomes to the educational intervention.

Instruments and data collection

Two primary outcome variables were assessed in this study: smoking behavior and anxiety levels. Smoking behavior was measured using a structured questionnaire adapted from validated instruments, which evaluated daily cigarette consumption, situational smoking triggers, nicotine dependence levels, and motivation to quit. Anxiety levels were assessed using the Hamilton Anxiety Rating Scale (HARS), a well-established clinician-administered instrument consisting of 14 items that evaluate both somatic and psychological symptoms of anxiety. Each item is rated on a 5-point Likert scale ranging from 0 (not present) to 4 (very severe), yielding a total score between 0 and 56, where higher scores reflect more severe anxiety symptoms.

Data collection was conducted at two time points: baseline (pretest) prior to the intervention and follow-up (posttest) after the four-week intervention period. All assessments were performed by trained research assistants who were blinded to group allocation in order to minimize potential assessment bias. The instruments used had been previously validated and reviewed for contextual suitability to ensure the accuracy and reliability of the measurements.

Data analysis

Quantitative data were analyzed using IBM SPSS Statistics version 26. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to summarize participants' sociodemographic and clinical characteristics. To examine the effectiveness of the intervention, inferential statistical analyses were conducted. Within-group changes in smoking behavior and anxiety levels from pretest to posttest were analyzed using paired sample t-tests. Between-group differences in mean change scores were evaluated using independent sample t-tests. All analyses were two-tailed with a significance level set at $p < 0.05$, indicating statistical significance for observed differences attributable to the intervention.

Results

Sociodemographic and clinical characteristics of participants

The following section presents the sociodemographic and clinical characteristics of the study participants. This information is essential to describe the baseline profile of individuals in both the intervention and control groups, ensuring comparability prior to the implementation of the intervention. Variables assessed include age, gender, education level, employment status, duration of hypertension, baseline cigarette use, and baseline anxiety scores.

Table 1 shows that the sociodemographic and clinical characteristics of participants in both the intervention and control groups were comparable at baseline. The mean age of participants was similar between the two groups (56.2±8.7 years in the intervention

Table 1. Sociodemographic and clinical characteristics of participants (N=110).

Characteristic	Intervention group, n=55 (%)	Control group, n=55 (%)	p
Age (mean±SD)	56.2±8.7 years	55.4±9.1 years	0.623
Gender			0.815
Male	41 (74.5)	43 (78.2)	
Female	14 (25.5)	12 (21.8)	
Education level			0.392
Primary	15 (27.3)	17 (30.9)	
Secondary	27 (49.1)	25 (45.5)	
Tertiary	13 (23.6)	13 (23.6)	
Employment status			0.681
Employed	24 (43.6)	26 (47.3)	
Unemployed/Retired	31 (56.4)	29 (52.7)	
Duration of hypertension			0.537
<5 years	19 (34.5)	21 (38.2)	
≥5 years	36 (65.5)	34 (61.8)	
Baseline cigarette use (cigs/day)	13.7±4.6	13.9±4.4	0.821
Baseline HARS Score	27.8±6.5	28.1±6.3	0.752

group and 55.4 ± 9.1 years in the control group; $p=0.623$). The gender distribution was also balanced, with a predominance of male participants in both groups (74.5% vs. 78.2%; $p=0.815$). Education levels and employment status showed no significant differences, with similar proportions of participants having primary, secondary, or tertiary education, and being either employed or unemployed/retired ($p=0.392$ and $p=0.681$, respectively). Likewise, the duration of hypertension was comparable, with most participants in both groups having been diagnosed for five years or more ($p=0.537$). In terms of clinical variables, both groups reported nearly identical baseline cigarette consumption (13.7 vs. 13.9 cigarettes/day; $p=0.821$) and anxiety levels, as measured by the Hamilton Anxiety Rating Scale (27.8 vs. 28.1; $p=0.752$). These results suggest that the two groups were well-matched across key characteristics, supporting the internal validity of the intervention assessment.

Within-group changes in smoking behavior and anxiety levels

This section presents the within-group comparisons of smoking behavior and anxiety levels before and after the intervention. The analysis was conducted separately for the intervention and control groups to evaluate any significant changes over time following the respective treatments received.

Table 2 shows that the within-group analysis revealed significant improvements in the intervention group following the animated health promotion video program. The average number of cigarettes smoked per day significantly decreased from 13.7 ± 4.6 at pretest to 7.1 ± 3.9 at posttest ($p < 0.001$), indicating a substantial reduction in smoking behavior. Similarly, anxiety levels measured by the Hamilton Anxiety Rating Scale (HARS) showed a significant decline, with mean scores dropping from 27.8 ± 6.5 to 17.2 ± 5.4 ($p < 0.001$). In contrast, the control group showed no statistically significant changes in either smoking behavior (13.9 ± 4.4 to 13.5 ± 4.2 ; $p=0.092$) or anxiety levels (28.1 ± 6.3 to 27.5 ± 6.2 ; $p=0.106$). These findings suggest that the intervention was effective in reducing both cigarette consumption and anxiety among hypertensive smokers.

Between-group differences in outcome improvements

This section presents the between-group comparisons to evaluate the differential effects of the intervention. The analysis focuses on changes in smoking behavior and anxiety levels from pretest to posttest in the intervention group compared to the control group, highlighting the effectiveness of the animated health promotion

videos in achieving better outcomes. Table 3 presents the between-group comparison of mean change scores for smoking behavior and anxiety levels. The intervention group demonstrated a significant reduction in the number of cigarettes smoked per day, with a mean decrease of 6.6 ± 3.8 , compared to only 0.4 ± 1.9 in the control group. This yielded a mean difference of -6.2 cigarettes per day ($p < 0.001$), indicating a substantial intervention effect. Similarly, anxiety levels as measured by the Hamilton Anxiety Rating Scale (HARS) showed a markedly greater reduction in the intervention group (mean change = -10.6 ± 4.2) than in the control group (-0.5 ± 2.3), resulting in a mean difference of -10.1 points ($p < 0.001$). These findings provide strong evidence that the animated health promotion video program significantly outperformed routine care in reducing both smoking behavior and anxiety levels among hypertensive smokers.

Discussion

This study examined the effectiveness of an animated health promotion video program in reducing cigarette consumption and anxiety levels among hypertensive smokers. The findings revealed that participants who received the animated video intervention experienced statistically and clinically significant improvements in both behavioral (smoking) and psychological (anxiety) outcomes compared to those who received routine care. These results underscore the value of animated educational media as an innovative, engaging, and accessible tool to support behavior change in clinical populations, particularly individuals living with chronic conditions such as hypertension.

Baseline analyses confirmed that participants in both the intervention and control groups were demographically and clinically comparable in key characteristics, including age, gender, education, employment status, duration of hypertension, initial cigarette consumption, and baseline anxiety levels. This homogeneity strengthens the study's internal validity by ensuring that post-intervention differences are more likely attributable to the intervention itself rather than confounding factors. Within-group analysis showed that participants in the intervention group reduced their daily cigarette consumption significantly from an average of 13.7 to 7.1 cigarettes per day and experienced a notable decline in anxiety, with Hamilton Anxiety Rating Scale (HARS) scores decreasing from 27.8 to 17.2. In contrast, the control group showed no statistically significant changes. Between-group comparisons further demonstrated the superiority of the intervention, with mean differ-

Table 2. Within-group changes in smoking behavior and anxiety levels (pretest-posttest).

Outcome variable	Time point	Intervention group (n=55)	p	Control group (n=55)	p
Cigarettes per day	Pretest	13.7±4.6		13.9±4.4	
	Posttest	7.1±3.9	<0.001*	13.5±4.2	0.092
HARS Score	Pretest	27.8±6.5		28.1±6.3	
	Posttest	17.2±5.4	<0.001*	27.5±6.2	0.106

Table 3. Between-group comparison of mean change scores in outcome variables.

Outcome variable	Mean change (intervention)	Mean change (control)	Mean difference	p
Cigarettes per day	-6.6±3.8	-0.4±1.9	-6.2	<0.001*
HARS anxiety score	-10.6±4.2	-0.5±2.3	-10.1	<0.001*

ences of -6.2 cigarettes per day and -10.1 HARS points, both highly significant ($p < 0.001$), highlighting the practical relevance of the intervention in clinical practice.

These findings align with a growing body of literature supporting the use of multimedia-based health education to influence cognitive, emotional, and behavioral health outcomes. Prior studies^{23,24} have shown that audiovisual interventions tailored to target populations significantly enhance smoking cessation outcomes. Likewise, other research^{28,29} has reported reductions in psychological distress through the use of animated content that enhances comprehension and emotional engagement with health information. The current study reinforces and extends this evidence base by demonstrating the efficacy of such interventions among high-risk individuals, specifically hypertensive smokers, thus contributing to the broader understanding of multimedia's role in health promotion.

The intervention's design is theoretically grounded in Bandura's Social Cognitive Theory, which emphasizes the roles of observational learning, reinforcement, and self-efficacy in behavior change. The animated videos likely served as visual models for healthier behaviors and coping mechanisms, strengthening participants' confidence in their ability to reduce smoking and manage anxiety. The narrative-based and visually engaging format may have improved attention, comprehension, and retention of health messages, particularly among individuals with varying degrees of health literacy.^{25,26} The substantial reductions in anxiety observed may reflect both direct effects, such as increased understanding of stress management techniques, and indirect effects through reduced nicotine intake, which can alleviate nicotine-induced anxiety symptoms. These results illustrate the interconnectedness of behavioral and psychological health and the benefit of addressing both domains simultaneously.

Despite these promising findings, certain limitations must be acknowledged. The study assumed similar baseline motivation and equal access to intervention materials across groups an assumption supported by the absence of significant baseline differences. However, the relatively short duration of follow-up limits the ability to assess the long-term sustainability of behavior change and anxiety reduction. Furthermore, reliance on self-reported smoking behavior may introduce reporting bias, although this was mitigated through the use of structured and standardized data collection protocols. Future research should include longer follow-up periods, incorporate objective measures of smoking behavior, and examine the cost-effectiveness and adaptability of animated interventions in diverse healthcare settings and populations. Overall, the evidence from this study supports the integration of animated health education videos into chronic disease management strategies to improve patient engagement and outcomes.

Strengths and limitations

The study titled "Using animated health promotion videos to reduce smoking and anxiety in hypertensive patients: a quasi-experimental study" possesses several notable strengths. Its rigorous quasi-experimental design with a control group allows for a robust evaluation of the intervention's effectiveness, while the use of validated instruments, such as the Hamilton Anxiety Rating Scale (HARS), ensures accurate measurement of psychological outcomes. The comparability of baseline characteristics between groups strengthens internal validity, and the use of animated videos enhances engagement, particularly among individuals with limited health literacy. Additionally, assessing both behavioral and psychological outcomes offers a comprehensive understanding of the intervention's impact. However, the study also has limitations,

including a relatively short follow-up period that may not capture the long-term sustainability of behavior changes, reliance on self-reported smoking data prone to bias, and the absence of blinding, which could influence outcome reporting. Moreover, being a single-center study, the generalizability of the findings is limited, and potential external influences on smoking behavior and anxiety levels were not fully controlled.

Conclusions

In conclusion, this quasi-experimental study demonstrates that animated health promotion videos are an effective intervention for reducing both smoking behavior and anxiety levels among hypertensive patients. The significant improvements observed in the intervention group, compared to routine care, highlight the value of multimedia-based education in enhancing patient engagement and facilitating behavior change. By simplifying complex information and promoting emotional connection, animated videos serve as a powerful tool to support chronic disease management. These findings support the integration of tailored, accessible health education strategies into routine clinical practice. Future research is needed to evaluate the long-term sustainability of these effects and to explore their applicability across diverse populations and healthcare settings.

References

1. Pinontoan OR, Sumampouw OJ. Environmental Health Epidemiology; Non-Communicable Diseases. Pertama. Nelwan JE, editor. Yogyakarta, Indonesia: Deepublish CV Budi Utama; 2019. 109 p.
2. WHO. World Health Statistics; Monitoring Health For The SDGs (Sustainable Development Goals) 2021. Available from: <https://apps.who.int/iris/bitstream/handle/10665/342703/9789240027053-eng.pdf>
3. Muslimin I, Ashriady, Mariana D, Syamsul M. Epidemiology of communicable and non-communicable diseases. Delapan. Risnawati, editor. Pamekasan, Jawa Timur Indonesia: Duta Media Creative; 2021. 129 p.
4. Whelton PK, Carey RM, Aronow WS, et al. 2023 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults. *Hypertension* 2023;71:E13–15.
5. Kemenkes RI. Laporan_Nasional_RKD2018_FINAL.pdf. Badan Penelitian dan Pengembangan Kesehatan. 2018. p. 1–629.
6. Ministry of Health the Republic of Indonesia. Regulation of The Minister of Health of The Republic of Indonesia. Jakarta, Indonesia: Jakarta: Minister of Health of the Republic of Indonesia; 2022. 1–9 p.
7. World Health Organization. Gats|Global Adult Tobacco Survey Fact Sheet Indonesia 2021 Gats Objectives. Fact Sheet Indones. 2021;1–2.
8. Heidenreich PA, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure. *J Card Fail.* 2022;28(5):e1–167.
9. Holipah H, Sulistomo HW, Maharani A. Tobacco smoking and risk of all-cause mortality in Indonesia. *PLoS One* 2020;15:e0242558.

10. Sochocka M, Karska J, Pszczolowska M, et al. Cognitive Decline in Early and Premature Menopause. *Int J Mol Sci* 2023;24:6566.
11. Direktorat P2PTM. Mengenal Tanda dan Gejala Serangan Dini Penyakit Jantung Koroner. P2PTM Kemenkes RI. 2019;30.
12. Gallucci G, Tartarone A, Lerose R, Lalinga AV, Capobianco AM. Cardiovascular risk of smoking and benefits of smoking cessation. *J Thorac Dis* 2020;12:3866–76.
13. Johanis IJ, Hinga IAT. Risk factors for hypertension, smoking and age on the incidence of coronary heart disease. *Media Kesehat Masy* 2020;16:116–26.
14. Sharma-Kumar R, Puljević C, Gartner K. Acceptance and effectiveness of a video promoting smoking cessation among Australians with mental illness. *Public Heal Educ* 2021;49:506-15.
15. Nijjar PS, Connett JE, Lindquist R, et al. Randomized trial of mindfulness-based stress reduction in cardiac patients eligible for cardiac rehabilitation. *Sci Rep* 2019;9:18415.
16. Chopra S. *Anxiety: A Philosophical Guide*. Tempio R, editor. Oxford: Princeton University Press; 2024. 166 p.
17. Hamzah, Akbar H, Faisal, Rafsanjani TM. Basic theory of epidemiology of non-communicable diseases. Sugiyatmi TA, editor. Aceh, Indonesia: Yayasan Penerbit Muhammad Zaini; 2021. 218 p.
18. P. Emen AJ, Edrada SL. Effectiveness of health promotion audiovisual materials in reducing nicotine dependence among young adults. *Am Sci Res J Eng* 2020;143–62.
19. Elling JM, De Vries H. Influence of animation- versus text-based delivery of a web-based computer-tailored smoking cessation intervention on user perceptions. *Eur J Heal Commun* 2021;2:1–23.
20. Anggelina S, Trisnadoli A. Analisis Efektivitas Pesan Film Animasi 3D Bahaya Rokok terhadap Perokok Aktif Remaja dan Dewasa. *ANDHARUPA J Desain Komun Vis Multimed* 2020;6:115–24.
21. Anggraini CCD. Analysis of the use of video media on the learning interest of BI Class Students in Elementary School Teacher Education at the Universitas Terbuka. *Widyagogik J Pendidik dan Pembelajaran Sekol Dasar* 2022;10:225–33.
22. Haddaway NR, Page MJ, Pritchard CC, McGuinness LA. PRISMA2020: An R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and Open Synthesis. *Campbell Syst Rev* 2022;18:e1230.
23. Ismail I, Siddiq R, Bustami B. The effectiveness of health education using audiovisual on the santri smokers' motivation to stop smoking. *Asian Pacific J Cancer Prev* 2021;22:2357–61.
24. Dismiantoni N, Anggunan, Triswanti N, Kriswastiny R. Relationship between smoking and hereditary history with hypertension. *Juni* 2020;11:30–6.
25. John W, J. David Creswell. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 5th ed. California: SAGE Publications, Inc; 2018.
26. Listiana S, Yulianti F, Kesehatan P, Kemenkes P. The effect of animation video about the dangerous of smoking. *Jurnal Kesehatan Siliwangi* 2021;2:185–93.
27. Ye L, Ye Y, Gao H. Effectiveness of social video platforms in promoting smoking cessation among youth: A content-specific analysis of smoking cessation topic videos on the social platform Bilibili. *Tob Induc Dis* 2023;21:1–10.
28. Mkperedem AA, Oye JA, Etta-Oyong SO, et al. Impact of school values on mass media preference and usage: a study of a private university in North Central, Nigeria. *Humanit Soc Sci Commun* 2023;10:569.
29. Holianto V. Community medicine & education differences in the effectiveness of health promotion through video and leaflets. *Comm Med Educ* 2021;2:128–38
30. Airhihenbuwa CO, Tseng TS, Sutton VD, Price LS. Global perspectives on improving chronic disease prevention and management in diverse settings. *Prev Chronic Dis* 2021;18:E33.
31. Woods B, Rai HK, Elliott E, Aguirre E, Orrell M, Spector A. Cognitive stimulation to improve cognitive functioning in people with anxiety. *Cochrane Database Syst Rev* 2023;2023:CD005562.