



Animaker-Based Clinical Breast Examination Video (VANS) And Motivation For Early Breast Cancer Detection Among Women Of Reproductive Age

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Abstract

Breast cancer remains a major public health concern, while the uptake of clinical breast examination (SADANIS) at Suranadi Community Health Center was only 3.47% in 2023. This study developed an Animaker-based animated clinical breast examination video (VANS) and assessed changes in motivation for early breast cancer detection among women of reproductive age. We conducted a one-group pretest-posttest study in August 2025 among 30 participants selected through purposive sampling. Ten experts assessed media feasibility, and we compared motivation scores using the Wilcoxon signed-rank test. The VANS video achieved an overall feasibility score of 88% (very feasible); content quality, objectives, and graphics each scored 90%. Mean motivation increased from 69.67 (SD 3.66; 95% CI 68.30-71.04) before the intervention to 90.63 (SD 10.36; 95% CI 86.76-94.50) afterward ($p < 0.001$). The standardized mean change calculated using the average pretest and posttest standard deviation was large ($d_{av} = 2.70$). Exposure to VANS was associated with improved motivation; however, causal inference is limited by the absence of a control group, the small single-site sample, and short-term measurement.

Keywords: Breast Cancer; Clinical Breast Examination; Motivation; Animated Video

INTRODUCTION

Breast cancer was the most frequently diagnosed cancer among women worldwide in 2022, with approximately 2.3 million new cases and about 666,000 deaths. (Xiong et al., 2025). In Indonesia, GLOBOCAN 2022 estimated 66,271 new breast cancer cases and 22,598 deaths, placing breast cancer first by incidence and among the leading causes of cancer mortality. (Ferlay et al., 2022). Global guidance emphasizes health promotion, early detection, timely diagnosis, and access to comprehensive management as integrated components of breast cancer control. (Smolarz et al., 2022)

In West Nusa Tenggara Province, routine program data in 2022 recorded 93 women with tumors or suspected breast cancer among women who

underwent early-detection services. West Lombok Regency reported the highest number of cases in the provincial dataset. (Dinas Kesehatan Provinsi Nusa Tenggara Barat, 2023). At Suranadi Community Health Center, 191 of 5,499 women of reproductive age received SADANIS in 2023, for a coverage of 3.47%. (Puskesmas Suranadi, 2023) SADANIS services were generally provided alongside visual inspection with acetic acid services or when women reported a breast lump, indicating a substantial gap in proactive early-detection uptake. (Hapsari, 2018)

Clinical breast examination can support the early recognition of breast abnormalities and referral for diagnostic assessment, particularly where access to mammography is limited; it should be embedded within an organized pathway that links awareness,

assessment, diagnosis, and treatment. (Organization, 2023; World Health Organization, 2017) Previous Indonesian studies indicate that knowledge, attitudes, exposure to information, family support, and support from health workers are associated with participation in SADANIS. (Nurlita et al., 2024) These findings suggest that health-promotion media should not merely provide information, but should also strengthen perceived relevance, confidence, and intention to seek examination.

Animated video can integrate narration, text, graphics, and demonstrations in a concise format. Prior studies have mainly evaluated animation or video for breast self-examination knowledge and skills, rather than motivation to attend a clinical breast examination. (Pembroke et al., 2021). Evidence specifically evaluating an Animaker-based SADANIS video among women of reproductive age in a primary-care setting remains limited. This study therefore aimed to develop and assess the feasibility of VANS and to examine the change in motivation for early breast cancer detection before and after exposure to the video. (Latif & Tiala, 2022)

Despite growing evidence supporting animated and video-based health education to improve breast cancer-related knowledge, attitudes, self-examination skills, and preventive behaviors, a key gap remains in using animated media to promote motivation to undergo clinical breast examination (SADANIS). (Indhumathi et al., 2025) Previous studies have predominantly focused on breast self-examination (BSE/SADARI), in which women are encouraged to identify breast abnormalities through self-assessment. However, SADANIS represents a different behavioral pathway because it requires women to move beyond individual awareness and actively seek examination from trained health professionals within a healthcare setting. Therefore, evidence regarding whether digital animated education can strengthen women's motivation

to access SADANIS remains limited, particularly in primary-care settings where early-detection coverage is low. (Marques et al., 2020)

This gap is particularly relevant in the working area of Suranadi Community Health Center, where only 191 of 5,499 women of reproductive age received SADANIS in 2023, corresponding to a coverage of 3.47%. The low uptake suggests the challenge may extend beyond service availability to include insufficient awareness, uncertainty about the examination process, perceived barriers, and limited motivation to seek professional breast examination. (Donnelly & Hwang, 2015) Consequently, an educational intervention that only transfers knowledge may not be sufficient to stimulate preventive health-seeking behavior. Health communication should also give women a clear understanding of the relevance of early detection, what happens during the examination, where to access the service, and why seeking an examination is an actionable and beneficial response to breast cancer risk. (WHO, 2013)

The novelty of the present study lies in its specific behavioral and service-oriented focus. Rather than evaluating animated media solely in relation to knowledge or breast self-examination skills, this study applies an Animaker-based animated video, namely VANS, specifically to increase motivation for clinical breast examination among women of reproductive age. (Feeley et al., 2023). VANS integrates breast cancer awareness, the importance and purpose of SADANIS, the examination sequence, and practical information on accessing SADANIS services. Thus, the innovation is not merely the use of animation as an educational medium, but the development of a concise, accessible communication intervention designed to bridge the gap between breast cancer awareness and willingness to use professional early-detection services. (Azhar et al., 2023) In this respect, the study provides an underexplored primary-care perspective on how digital

visual communication may support the behavioral pathway toward SADANIS participation. (American Cancer Society, 2016)

METHOD

This one-group pretest-posttest study was conducted in August 2025 in the working area of Suranadi Community Health Center, Narmada District, West Lombok Regency. We revised the reporting based on recommendations for transparent reporting of nonrandomized public-health interventions.

The study included 30 women of reproductive age who were recruited using purposive sampling. Eligibility criteria included owning and being able to operate a mobile phone, being able to read and write, being willing to participate, and being able to cooperate throughout data collection. The sample size was determined on a feasibility basis, considering the availability of eligible participants, the study period, and the resources available for participant recruitment and data collection. No formal a priori sample-size calculation or statistical power analysis was performed.

Participants received an educational intervention using VANS, an animated video developed with Animaker. The video content covered breast cancer awareness, the importance and purpose of clinical breast examination (SADANIS), the sequence of the examination, and practical instructions on how to access SADANIS services at healthcare facilities. The video was delivered in Indonesian, lasted 4 minutes and 33 seconds, and was accessible through the “Ayu Dian Official” YouTube channel. During the initial intervention session, participants watched the video under the direct supervision of the research team to ensure complete exposure to the educational content. After the supervised session, participants were given access to the video and were permitted to watch it again independently at home during a seven-day follow-up period. We reassessed motivation using the same

questionnaire seven days after the initial video exposure.

Media feasibility was evaluated by 10 validators representing media expertise, content expertise, midwifery education, and clinical midwifery practice. The assessment covered content quality and objectives, language, presentation, and graphics. Scores were converted to percentages and interpreted using the categories applied in the original development protocol.

Motivation was measured before and after the intervention using a 25-item self-administered questionnaire. Each item was rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), resulting in a possible total score ranging from 25 to 125. Negatively worded items were reverse-scored before the item scores were summed. A higher total score indicated stronger motivation to undergo clinical breast examination (SADANIS). (Polit & Beck, 2006)

Data processing included checking, coding, entry, and cleaning. Continuous variables are presented as mean, standard deviation, minimum, and maximum; categorical variables are presented as frequency and percentage. We assessed normality using the Shapiro-Wilk test. Because the pretest motivation score was not normally distributed, we compared pretest and posttest scores using the Wilcoxon signed-rank test with a two-sided significance level of 0.05.

The Health Research Ethics Committee of Poltekkes Kemenkes Mataram granted ethical approval (No. DP.04.03/F.XL.26/616/2025). All participants provided informed consent before data collection.

RESULTS AND DISCUSSION

Table 1. Expert feasibility assessment of VANS (n=10)

Assessment aspect	Mean score (%)	Category
Content quality and objectives	90	Very feasible
Language	85	Very feasible
Presentation	87	Very feasible
Graphics	90	Very feasible
Overall	88	Very feasible

The overall feasibility score was 88%, indicating that the expert panel considered VANS very feasible. Content quality, objectives, and graphics received the highest scores (90%), followed by presentation (87%) and language (85%). These ratings indicate that the content was judged relevant and that the visual presentation supported clarity and engagement. The relatively lower language score supports simplifying technical expressions and using short, action-oriented sentences before wider implementation.

The feasibility findings are consistent with studies in which animated or video-based education improved breast-examination knowledge or skills.(Karimian et al., 2022; K. R. N. Kartikasari, 2025; Lilis et al., 2022; Rosanti et al., 2024). Multimedia learning theory proposes that coordinated verbal and visual representations can support selection, organization, and integration of information when unnecessary cognitive load is minimized. (Mayer, 2002) Nevertheless, expert feasibility does not equal

effectiveness; user comprehension, accessibility, and actual service uptake require separate evaluation.

Table 2. Continuous characteristics of participants (n=30)

Characteristic	Mean $\pm$ SD	Min	Max
Age (years)	26.33 $\pm$ 3.66	20	35
Number of children	1.40 $\pm$ 0.72	0	3
Age at menarche (years)	14.86 $\pm$ 3.12	11	20

Participants had a mean age of 26.33 $\pm$ 3.66 years, ranging from 20 to 35 years. The mean number of children was 1.40 $\pm$ 0.72, ranging from 0 to 3 children. Regarding reproductive characteristics, the mean age at menarche was 14.86 $\pm$ 3.12 years, with a minimum age of 11 years and a maximum of 20 years. Overall, the participants represented women of reproductive age with varying reproductive histories, providing a relevant population for assessing motivation toward early breast cancer detection through clinical breast examination (SADANIS).

Table 3. Categorical characteristics of participants (n=30)

Characteristic	n	%
Education: no schooling	4	13.33
Education: primary	9	30.00
Education: secondary	15	50.00
Education: higher	2	6.67
Not employed	29	96.67
Employed	1	3.33
Married	29	96.67
Not married	1	3.33

Participants had a mean age of 26.33 years. Half had completed secondary education, 96.67% were not employed, and 96.67% were married. The marital-status frequencies were adjusted to 29 married and 1 not married because these values match the reported percentages and total sample size.

Table 4. Shapiro-Wilk normality test for motivation scores

Measurement	df	p value
Pretest	30	0.007
Posttest	30	0.055

The pretest score deviated from normality ($p=0.007$); therefore, we conducted the paired comparison using the Wilcoxon signed-rank test.

Table 5. Motivation before and after exposure to VANS (n=30)

Time	Mean $\pm$ SD	95% CI	Range	p value
Pretest	69.67 $\pm$ 3.66	68.30-71.04	58-81	<0.001
Posttest	90.63 $\pm$ 10.36	86.76-94.50	76-109	<0.001

The mean motivation score increased by 20.96 points, from 69.67 before the intervention to 90.63 afterward, and the Wilcoxon test indicated a statistically significant difference ($p<0.001$). The standardized mean change based on the average pretest and posttest standard deviation was $d_{av}=2.70$, which is large. Because paired raw data and the correlation between measurements were unavailable, interpret this effect-size estimate as a standardized descriptive change rather than a complete paired-effects analysis. The result supports an association between VANS exposure and higher short-term motivation, but it does not establish causality on its own.

A plausible cognitive pathway is that animation makes unfamiliar information more concrete. By

combining spoken explanation with visual sequencing, VANS may improve attention, comprehension, and recall, reducing uncertainty about SADANIS and strengthening motivation. This interpretation is consistent with evidence that animated or multimedia education can improve breast-examination knowledge, skills, attitudes, and behavior. (Desri Nova et al., 2024; Gobel, 2020; Rosanti et al., 2024) A systematic review also indicates that motion graphics can support health communication when the content is theory-informed, culturally appropriate, concise, and repeated when necessary.(Suwanphan et al., 2025)

The Health Belief Model provides a behavioral explanation for the observed increase. The video may have increased perceived susceptibility and perceived severity by explaining breast-cancer risk and delayed detection, while emphasizing the benefits of early examination and reducing perceived barriers through clear instructions. It may also have acted as a cue to action and strengthened self-efficacy.(Desri Nova et al., 2024; Gobel, 2020) However, these constructs were not measured directly; therefore, this mechanism remains an interpretation rather than a tested mediation pathway.

From the Theory of Planned Behavior perspective, clearer information may contribute to a more favorable attitude toward SADANIS and greater perceived behavioral control, both of which can strengthen intention.(Ajzen, 2020) Evidence from Indonesian women also suggests that attitudes, perceived control, social influences, and other psychosocial factors are relevant to early breast-detection intentions and behavior. (Dewi et al., 2022). Family encouragement and active recommendation by health workers may therefore amplify the effect of video education. (Du et al., 2008)

Risk messages should be calibrated carefully. Moderate concern and a clear perception of personal

risk can prompt information seeking and action, whereas fear without a feasible response may produce avoidance. VANS should therefore pair risk information with practical steps, reassurance, service location, and a clear call to action. Repeated access through family health-post activities or mobile messaging may reinforce memory, but future studies should test the optimal frequency rather than assume that more exposure is always better.(Hansen et al., 2024)

This study has several limitations. The absence of a control group means history, maturation, testing effects, regression to the mean, Hawthorne effects, and other concurrent influences cannot be ruled out. The small purposive sample from one health-center area limits generalizability, while requiring mobile-phone ownership and literacy may have introduced selection bias. Motivation was self-reported and measured only shortly after the intervention; social-desirability bias and short-term response effects are possible. The study did not assess actual SADANIS attendance, diagnostic follow-up, or sustained behavior. In addition, the available manuscript did not provide complete instrument scoring, validity, reliability, intervention-dose, or sample-size calculation details. A future multicenter controlled study should use a fully reported validated instrument, longer follow-up, and objective SADANIS uptake as an outcome.

This study's findings show a substantial short-term increase in motivation after VANS exposure. The mean motivation score increased by 20.96 points, from 69.67 before the intervention to 90.63 after the intervention, with a statistically significant difference ($p < 0.001$). The standardized mean change based on the average pretest and posttest standard deviation was large ($d_{av} = 2.70$). These findings suggest that VANS was capable of producing a meaningful short-term change in participants' willingness to consider early breast cancer detection through SADANIS. The

magnitude of the change is particularly noteworthy because motivation is an intermediate behavioral construct that precedes actual health-service utilization. Therefore, the observed improvement may represent an important initial step in the pathway from awareness to preventive action.

However, the increase in motivation should not be interpreted as evidence that VANS directly increased SADANIS attendance. Motivation represents an intention-related outcome, whereas the ultimate public-health objective is actual utilization of early-detection services, followed by appropriate diagnostic assessment and treatment when abnormalities are identified. The present study did not measure subsequent SADANIS attendance, referral completion, or diagnostic follow-up. Therefore, the findings support an association between exposure to VANS and increased short-term motivation rather than a definitive causal effect on clinical breast examination uptake. This distinction matters because interventions that improve knowledge or motivation do not necessarily produce sustained changes in health behavior.

The local context strengthens the relevance of these findings. SADANIS coverage at Suranadi Community Health Center was only 3.47% among women of reproductive age in 2023. This low coverage indicates a considerable gap between the target population and the utilization of available early-detection services. In such a setting, women may require more than general information about breast cancer. They may need specific and actionable information that reduces uncertainty about the examination process and makes the recommended behavior easier to understand and initiate. VANS was designed to address this communication gap by explaining not only why early detection is important but also what SADANIS involves and how women can access the service. Consequently, the intervention has potential relevance as a communication bridge between

community-based health promotion and primary-care service utilization.

The findings may also be understood through the Health Belief Model (HBM). By presenting information about breast cancer and the importance of early detection, VANS may increase perceived susceptibility and perceived severity. At the same time, explaining the examination process and access to services may strengthen perceived benefits and reduce perceived barriers. The video may also cue action by reminding women that early detection requires a concrete preventive response. In addition, visually demonstrating the examination process may enhance self-efficacy by making an unfamiliar health procedure more predictable and understandable. Nevertheless, the present study did not directly measure these HBM constructs. Therefore, the proposed mechanism should be regarded as a theoretically plausible explanation rather than a tested mediation pathway.

The Theory of Planned Behavior (TPB) provides another useful perspective. Clear, accessible information may foster more favorable attitudes toward SADANIS and increase perceived behavioral control by reducing uncertainty about where and how to obtain the examination. These factors can contribute to stronger behavioral intention. Previous evidence has also demonstrated that psychosocial factors, including attitudes, perceived behavioral control, social influence, family support, and health-worker support, may influence breast cancer early-detection behavior. Therefore, the effect of VANS may potentially be strengthened when the video is combined with active counseling, family encouragement, health-worker recommendations, and facilitated access to screening services.(Teixeira et al., 2022)

VANS therefore has the potential to transform health information from passive knowledge into an actionable behavioral message. Conventional health

education may explain the prevalence and risk factors of breast cancer without necessarily answering the practical questions that influence service utilization: "Why should I undergo SADANIS?", "What will happen during the examination?", "Is the examination difficult or embarrassing?", and "Where can I obtain the service?" By combining narration, visual sequencing, and practical instructions within a short 4-minute-and-33-second video, VANS may reduce informational uncertainty and increase perceived readiness to seek professional examination. This may explain, at least in part, why the intervention was associated with a marked increase in motivation.(Gunawan et al., 2019)

The feasibility assessment further supports the potential applicability of VANS in primary-care health promotion. The overall feasibility score was 88%, categorized as very feasible, while content quality, objectives, and graphics each received the highest score of 90%. These findings indicate that experts considered the educational content relevant and the visual presentation appropriate for communicating the intended message. The relatively lower language score of 85% also provides useful developmental feedback, suggesting that technical terminology and sentence structures should be simplified further to improve accessibility across different literacy levels. Thus, the feasibility assessment should not be viewed merely as a technical validation step but as evidence that the intervention has potential for practical implementation with further refinement. (Uzochukwu et al., 2020)

The intervention may also be scalable because the video is concise, delivered in Indonesian, and accessible through a mobile platform. In primary-care settings, VANS could be incorporated into health promotion sessions, community outreach, Posyandu activities, WhatsApp-based education, waiting-room education, or individual counseling by midwives and other health professionals. Importantly, VANS should function as a complementary communication tool

rather than a replacement for professional counseling. Combining digital education with health-worker interaction may be particularly useful because video can standardize information. At the same time, health professionals address individual concerns, misconceptions, emotional responses, and barriers to service utilization.

CONCLUSION

Experts rated VANS as very feasible, with an overall score of 88%. Motivation scores were higher after exposure to the animated video than before exposure (69.67 vs 90.63; $p < 0.001$; $d_{av} = 2.70$). These findings indicate that VANS was associated with improved short-term motivation for early breast cancer detection among women of reproductive age. The findings should not be interpreted as definitive evidence of causal effectiveness because the study used a one-group design, a small single-site sample, and no behavioral follow-up. VANS may be used as an adjunct to health-worker counseling and community outreach while more rigorous controlled research evaluates sustained motivation and actual SADANIS participation.

DECLARATION

Author Contributions: NPDA, NPKE, and RAW collected the data, performed the data analysis, and acquired funding. NPDA, NPKE, and RAW presented the results, drafted the original manuscript, and reviewed the manuscript. NPDA, NPKE, and RAW made critical revisions to the paper for important intellectual content. ED critically evaluated the paper. All authors have read and agreed to the final version of the manuscript and contributed to this work.

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Ethical considerations: This study was conducted as part of a community-based health empowerment program. The Ethics Committee of Poltekkes Kemenkes Mataram, Indonesia, approved this study (Approval No. DP.04.03/F.XL.26/616/2025). All participants received a full explanation of the study objectives and procedures and provided verbal informed consent before participating. The study maintained participant confidentiality and anonymity, and used data solely for research and publication purposes.

Competing interests: The authors have no conflicts of interest to declare.

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data collection, data analysis, interpretation of findings, or scientific decision-making.

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