



Comparison of Animated Videos and E-Pocket Books Regarding Occupational Health and Safety Knowledge Among Anesthesia Nursing Students

Nurul Fadila Sofyan^{1*}, Ratih Kusuma Dewi², Niken Anggraini Sri Saputri²

Anesthesiology Nursing Diploma IV, Faculty of Health Sciences, Universitas 'Aisyiyah Yogyakarta, Indonesia

ARTICLE INFO

Article History:

Submitted: 02-06-2026

Revised: 29-06-2025

Accepted: 12-07-2026

Published: 13-08-2026

 doi.org/10.58545/jkmi.v5i2.760

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ABSTRACT

Background: Occupational Safety and Health (OSH) is a crucial aspect of anesthesiology practice. Anesthesia students need to understand OSH principles early, given their exposure to physical, chemical, biological, and ergonomic hazards in the workplace. The high number of workplace accidents in Indonesia (462,241 cases in 2024) highlights the need for effective learning media. Animated videos and e-pocket books are important because they provide engaging, flexible, and repeatable learning experiences that can improve students' understanding of OSH. **Objective:** To determine the comparison of the effectiveness of creative video media and OHS e-pocket books on the level of knowledge among Anesthesiology Nursing students at Universitas Aisyiyah Yogyakarta. **Methods:** This quantitative study used a pre-experimental two-group pretest-posttest design involving 60 students divided into animation video and e-pocket book groups (30 respondents each). The instrument was a valid and reliable questionnaire, with 21 of 25 items declared valid ($r > 0.361$) and a Cronbach's Alpha value of 0.883. Data were analyzed using the Wilcoxon Signed Rank Test and Mann-Whitney U Test. **Results:** The Mann-Whitney test result showed a p-value of 0.018, indicating a difference in effectiveness between the two media, with the e-pocket book being more effective than animated video in improving students' OSH knowledge. **Conclusion:** There was a difference in effectiveness between animated video media and e-pocket books in improving OHS knowledge among Anesthesiology Nursing students at Universitas Aisyiyah Yogyakarta.

Keywords: E-Pocket Book, Occupational Health and Safety, Anesthesiology Nursing, Knowledge, Animated Video

Corresponding Author:

Nurul Fadila Sofyan

Anesthesiology Nursing Study Program, Faculty of Health Sciences, Universitas 'Aisyiyah Yogyakarta,

Jl. Siliwangi (Ringroad Barat) No. 63, Mlangi Nogotirto, Gamping, Sleman, Daerah Istimewa Yogyakarta 55292, Indonesia.

Email: nurulfadilasofyan@gmail.com

How to cite:

Sofyan, N. F., Dewi, R. K., Saputri, N. A. S. (2026). Comparison of Animated Videos and E-Pocket Books Regarding Occupational Health and Safety Knowledge Among Anesthesia Nursing Students. *Jurnal Kegawatdaruratan Medis Indonesia*, 5(2), 194-203. <https://doi.org/10.58545/jkmi.v5i2.760>

I. INTRODUCTION

Occupational Safety and Health (OSH) is an important aspect of healthcare services, especially in hospital settings.

Anesthesia Nursing students need a good understanding of OSH because they will face various workplace risks during clinical practice at the Central Surgical Installation

(IBS), such as exposure to hazardous and toxic materials, infection risks, ergonomic hazards, noise, and potential work accidents (Suarjana, 2024).

Data from the World Health Organization (WHO) in 2023 show that in 11 countries in South and Southeast Asia, with a total population of around 1.5 billion, there are about 22.5 million cases of work-related accidents and illnesses and 699,000 work-related deaths. WHO also estimates that around 5 million workplace accidents occur every year, equivalent to 36 accidents every minute, 90,000 fatal accidents per year, and about 300 deaths each day. In addition, data from the Ministry of Manpower of the Republic of Indonesia show that during January to December 2024, there were 462,241 workplace accidents in Indonesia. These high numbers indicate that increasing knowledge and awareness of occupational health and safety remains an urgent need (Damanik et al., 2021).

Anesthesia Nursing students are future healthcare workers who will be directly involved in perioperative services in hospitals (Permenkes, 2016). Before entering clinical practice, students need sufficient knowledge of safety principles to protect themselves, their patients, and the work environment from potential risks (Etliawati & Yulistika, 2022). Increasing

students' knowledge can be achieved through digital learning media. Technology-based learning media have advantages because they are easy to access, flexible, and aligned with developments in educational technology (Pulungan et al., 2026). An e-book is a digital medium that presents material concisely and can be studied repeatedly. At the same time, animated videos are an audiovisual medium that combines images, sound, and animation, which can boost students' interest in learning (Jonanga et al., 2025).

Previous research has shown that educational videos and e-pocket books can improve students' knowledge. However, studies directly comparing the effectiveness of these two media for occupational health and safety (K3) material for Anesthesiology Nursing students remain limited (Mile et al., 2025). Therefore, this study aims to find out the comparison of the effectiveness of creative video media and e-pocket books on the K3 knowledge level of Anesthesiology Nursing students at Aisyiyah University, Yogyakarta.

2. METHODS

This is a quantitative pre-experimental study using a two-group pretest-posttest design (Sugiyono, 2023). The study was conducted on students of

the Anesthesiology Nursing Study Program at 'Aisyiyah University Yogyakarta, class of 2023, in February 2025. The population in this study includes all students of the Anesthesiology Nursing Study Program at 'Aisyiyah University, Yogyakarta, class of 2023. The sampling technique used was total sampling, with 60 respondents divided into two intervention groups: the creative video group (n=30) and the e-pocket book group (n=30).

The research instrument used a questionnaire on Occupational Health and Safety (OHS) knowledge that had already been tested for validity and reliability (Ali et al., 2022). Data were collected by administering a pretest to measure respondents' initial knowledge level. Next, the first group was given an intervention in the form of a creative video on OHS, while the second group received an intervention in the form of an e-pocketbook on OHS. The posttest was conducted two days after the intervention, using the same instrument to measure changes in respondents' knowledge levels.

Data analysis was conducted using a univariate approach to describe

respondents' characteristics and their K3 knowledge levels. Bivariate analysis used the Wilcoxon Signed-Rank Test to assess differences in knowledge levels before and after the intervention within each group (Sugiyono, 2023). The effectiveness of creative video and e-pocketbook media was compared using the Mann-Whitney U Test, with a significance level of $p < 0.05$. This research has received ethical approval from the Ethics Committee of Aisyiyah Yogyakarta University, with an ethics letter number as stated in the research documents.

3. RESULTS

The results of this study present the characteristics of the respondents by age, gender, and intervention group. There were a total of 60 respondents in this study, all Anesthesiology Nursing students from 'Aisyiyah University Yogyakarta, class of 2023, divided into two groups: 30 respondents in the creative video group and 30 respondents in the e-pocket book group. The results of the univariate analysis of respondent characteristics are presented in Table 1.

Table 1. Characteristics of respondents

Characteristics of respondents	Frequency	Percentage (%)	Frequency	Percentage (%)
Age				
19-20 years old	2	6.7	8	26.7
20-21 years old	24	80	17	56.7
21-22 years old	4	13.3	5	16.7
Gender				
Female	22	73.3	24	80
Male	8	26.7	6	20
Knowledge level				
High	20	66.7	20	66.7
Medium	10	33.3	10	33.3
Low	0	0	0	0

Table 1 presents the characteristics of respondents in the animated video and e-pocket book groups. The majority of respondents in both groups were aged 20–21 years, accounting for 80% (24 respondents) in the animated video group and 56.7% (17 respondents) in the e-pocket book group. Most respondents were female, comprising 73.3% (22 respondents)

in the animated video group and 80% (24 respondents) in the e-pocket book group. Before the intervention, the majority of respondents in both groups had a high level of knowledge: 20 respondents (66.7%) in each group, while the remaining 10 (33.3%) had a moderate level of knowledge. No respondents were categorized as having a low level of knowledge.

Table 2. Pretest and posttest results of the animated video and epocket book

Knowledge level	pre		post		pre		post	
	F	%	F	%	F	%	F	%
High	20	66.7	21	70	20	66.7	27	90
Medium	10	33.3	9	30	10	33.3	3	10
Low	0	0	0	0	0	0	0	0
p-value	.483				.000			

Table 2 shows the distribution of respondents' knowledge levels before and after the interventions in both groups. In the animated video group, the proportion of respondents with high knowledge increased slightly from 66.7% (20 respondents) to 70% (21 respondents), while the proportion with moderate knowledge decreased from 33.3% to 30%.

However, the Wilcoxon test indicated that this increase was not statistically significant ($p = 0.483$). In contrast, the e-pocket book group demonstrated a greater improvement, with the proportion of respondents with high knowledge increasing from 66.7% (20 respondents) to 90% (27 respondents) and those with moderate knowledge decreasing from

33.3% to 10%. The Wilcoxon test showed a statistically significant difference in knowledge levels before and after the intervention ($p = 0.000$). No respondents in

either group were categorized as having low knowledge before or after the intervention.

Table 3. Results of the comparison analysis between animated videos and epocket books

Group	Frequency	Mean rank	p value
Animated Video	30	25.67	0.018
Epocket Book	30	35.33	
Total	60		

Table 3 presents the results of the comparative analysis between the animated video and e-pocketbook interventions. The animated video group comprised 30 respondents, with a mean rank of 25.67, while the e-book group comprised 30 respondents, with a mean rank of 35.33. The Mann-Whitney U test showed a p-value of 0.018, indicating a significant difference between the two intervention groups. The higher mean rank in the e-pocket book group suggests that the increase in knowledge scores was greater there than in the animated video group.

4. DISCUSSION

The Effect of Using Animated Videos on OHS Knowledge

The study results showed an increase in the number of students with high knowledge after receiving a creative video intervention; however, the increase was not statistically significant ($p = 0.483$). This

indicates that animated video media can increase exposure to Occupational Safety and Health (OSH) materials. However, it is not sufficient to produce a significant improvement in knowledge within a short intervention period (Ummah & Oktova, 2024). The lack of significant improvement may be influenced by the one-way nature of video-based learning, which makes students passive in receiving information. This condition reduces active engagement in learning, especially in understanding procedural OSH concepts in clinical settings (Prastica et al., 2021). In addition, the limited duration and speed of material delivery in video media may result in some information not being fully absorbed by students (Fajari & Asiyah, 2022).

Differences in students' concentration and attention during video learning may also influence the effectiveness of the intervention. Students may not have the same level of focus during the learning process, which affects how information is

processed and retained (Morgado et al., 2024). Previous findings in this study also indicate that the effectiveness of audiovisual learning is influenced by learners' attention and cognitive engagement (Aghni & Al, 2021).

The Effect of Using Epocket Books on OHS Knowledge

The e-pocket book group showed a significant increase in knowledge ($p=0.000$), with the number of respondents in the high knowledge category increasing from 20 to 27 after the intervention. This finding indicates that e-pocketbook media is effective in improving Occupational Safety and Health (OSH) knowledge among Anesthesiology Nursing students (Jonanga et al., 2025).

The effectiveness of e-pocket books may be associated with their ability to support self-directed learning, enabling students to learn independently at their own pace and according to their needs (Nuryana et al., 2025). This learning media also offers flexibility, as it can be accessed at any time and repeatedly, thereby strengthening understanding and knowledge retention (Salsabiela et al., 2025).

In addition, the structured and systematic presentation of material in e-pocket books helps students process

information more effectively compared to non-text-based media (Wijaya et al., 2024). The availability of concise, easily accessible content on digital devices supports better comprehension of OSH material in clinical learning contexts (Nurbaithy et al., 2024).

Comparison of the Effectiveness of Animated Videos and Epocket Books

The Mann-Whitney test results showed a p-value of 0.018, indicating a significant difference in effectiveness both learning media. The e-pocketbook proved more effective than creative videos at improving the OHS knowledge of Anesthesia Nursing students. The advantage of the e-pocket book lies in its flexibility (Istiana et al., 2024). Students can access the material at any time, review material they did not understand, and adjust their learning pace to their abilities (Triana et al., 2022). This situation supports better information retention than video media

5. CONCLUSION

The knowledge level of Anesthesiology Nursing students increased after being given animated video media, but the increase was not statistically significant ($p=0.483$). The e-pocket book was shown to improve

students' knowledge ($p=0.000$) significantly. There was a difference in effectiveness between animated video media and the e-pocket book ($p=0.018$), with the e-pocket book being more effective in improving the OSH knowledge of Anesthesiology Nursing students at Aisiyah University, Yogyakarta.

ACKNOWLEDGEMENT

The researcher would like to express their gratitude to Universitas 'Aisiyah Yogyakarta, the supervisors and examiners, and all Anesthesiology Nursing students of the 2023 class who participated in this study. The authors also appreciate all parties who supported the research process and preparation of this manuscript.

AUTHOR CONTRIBUTIONS

NFS contributed to the study's conceptualization, literature review, data collection, data analysis, and manuscript drafting and revision. RKD contributed to research supervision, methodology development, data interpretation, and critical review of the manuscript. NASS contributed to research supervision, validation of the study findings, manuscript review, and final approval of the manuscript.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest related to the publication of this research.

DATA AVAILABILITY STATEMENT

Data supporting this study are not publicly available due to ethical approval restrictions and respondent confidentiality.

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