

A comparative study of IPE-based podcasts and guidebooks on disaster preparedness behavior

Studi Komparatif antara Podcast Berbasis IPE dan Buku Panduan Terhadap Perilaku Kesiapsiagaan Bencana

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ABSTRACT

Background: Disaster preparedness is a key competency for health students in disaster-prone countries like Indonesia. Effective educational media that support interprofessional learning are needed. Podcasts offer an innovative approach that can be integrated into Interprofessional Education Collaborative Practice (IPE-CP).

Objective: To analyze differences in knowledge and attitudes toward disaster prevention between students receiving podcast-based education and those using a handbook.

Methods: A quantitative quasi-experimental design was used. The experimental group (Padang) received podcast interventions, while the control group (Bandung) used the Guidelines for Health Crisis Management in Disasters (PKKB) handbook. A total of 200 respondents were included in the experimental group, and 100 in the control group (1:2 ratio). Data were collected using validated questionnaires and analyzed using the Mann-Whitney test.

Results: The mean knowledge score was higher in the podcast group (14.32) than in the handbook group (12.65) ($p < 0.05$). However, no significant difference was found in attitude scores between the podcast group (66.78) and the handbook group (66.25) ($p > 0.05$).

Conclusion: Podcasts were effective in improving knowledge but not attitudes. Podcast-based education integrated with IPE-CP principles showed greater effectiveness than handbook-based learning in enhancing students' disaster preparedness knowledge.

Keywords: disaster preparedness, IPE-CP, media, podcast

ABSTRAK

Latar Belakang: Kesiapsiagaan bencana merupakan kompetensi penting bagi mahasiswa kesehatan di negara rawan bencana seperti Indonesia. Media edukasi yang efektif dan mendukung pembelajaran interprofesional diperlukan. Podcast menjadi alternatif inovatif yang dapat diintegrasikan dengan pendekatan IPE-CP.

Tujuan: Menganalisis perbedaan pengetahuan dan sikap terkait pencegahan bencana antara kelompok yang menerima edukasi melalui podcast dan buku panduan.

Metode: Penelitian kuantitatif dengan desain quasi-eksperimental. Kelompok eksperimen (Padang) menerima intervensi podcast, sedangkan kelompok kontrol (Bandung) menggunakan buku PKKB. Sampel terdiri dari 200 responden (eksperimen) dan 100 responden (kontrol). Data dikumpulkan menggunakan kuesioner tervalidasi dan dianalisis dengan uji Mann-Whitney.

Hasil: Rata-rata pengetahuan kelompok podcast lebih tinggi (14,32) dibandingkan kelompok buku (12,65) ($p < 0,05$). Tidak terdapat perbedaan signifikan pada skor sikap antara kelompok podcast (66,78) dan buku (66,25) ($p > 0,05$).

Kesimpulan: Podcast efektif meningkatkan pengetahuan, namun tidak pada sikap. Edukasi berbasis podcast dengan pendekatan IPE-CP lebih efektif dibandingkan buku

dalam meningkatkan pengetahuan kesiapsiagaan bencana.

Kata kunci: IPE-CP, kesiapsiagaan bencana, media, podcast

INTRODUCTION

Indonesia is among the countries with the highest disaster vulnerability worldwide, including earthquakes, volcanic eruptions, floods, and tsunamis.^{1,2} Its geographic and geological characteristics make disaster preparedness a crucial competency that must be instilled from an early stage. According to data from the National Disaster Management Agency (BNPB), a total of 1,929 disasters occurred in Indonesia between January 1 and December 15, 2024.³ Preparedness is a proactive element of disaster risk management carried out before an event occurs.⁴ It emphasizes the development of capacities to enable rapid and accurate emergency response in disaster management efforts in Indonesia.^{4,5} One of the key areas that can be leveraged is educational institutions, which function as centers for knowledge development.

Health education institutions play a strategic role in preparing human resources capable of contributing actively to disaster response.⁶ Preparedness within academic institutions is intended to ensure that members of the academic community, particularly students, acquire knowledge, understanding, environmental awareness, and skills to anticipate and reduce risks in the event of a disaster.⁴ This is especially critical because health students are future professionals who will serve on the frontlines of emergency response and post-disaster recovery.⁷

Collaborative practice among health service providers is essential for optimal disaster response. However, in real disaster situations, professionals often work independently within their respective areas of expertise, rather than in an integrated manner. A promising solution is to implement community health programs through an interprofessional approach, Interprofessional Education (IPE).⁸ In line with the transformation of health education, Interprofessional Education Collaborative Practice (IPE-CP) has been globally recognized as an effective strategy for improving health service delivery, including disaster preparedness and response.⁹ WHO (2010) reported that health workers trained through IPE-CP approaches show significant improvements in communication, coordination, and collective decision-making during emergencies.¹⁰

Nevertheless, the implementation of IPE-CP in Indonesian health vocational education institutions still faces challenges, including the limited availability of engaging educational media that can bridge interprofessional learning needs in a flexible manner.⁷ The choice of learning media is also a determining factor in the success of educational interventions. Contemporary students are more responsive to flexible, technology-based media.¹¹ Podcasts, as an internet-based audio medium, represent a promising innovation for delivering disaster preparedness content in an engaging, accessible, and repeatable format.¹² Podcasts refer to digital files in audio or video formats uploaded to the web, accessible to both subscribers and non-subscribers, and available for on-demand listening or viewing.^{12,13} Their strength lies in their ability to present information narratively and reflectively while reaching students without time and space constraints.^{11,13} This offers significant opportunities to improve information uptake and shape stronger perceptions and attitudes toward disaster preparedness.

The Health Polytechnic of the Ministry of Health in Padang, as one of Indonesia's health education institutions, was designated a *Center of Excellence for Disaster Preparedness* in 2019 as part of its commitment to the Three Pillars of Higher Education (Tri Dharma Perguruan Tinggi). Supporting this study, preliminary research conducted in 2021–2022 on disaster preparedness behaviors among students at Poltekkes Kemenkes Padang found that, among 470 student respondents, 57% demonstrated good knowledge, 51.7% showed good attitudes, and 73.6% displayed good preparedness behaviors. In its initial phase, a model for enhancing disaster

preparedness behaviors through Android-based digital radio was designed and developed. In 2023, curriculum development for IPE and disaster preparedness podcasts was initiated, followed by plans for implementation and evaluation in 2024 using Android-based digital radio models to improve disaster preparedness behaviors. The podcasts were designed as audiovisual educational media containing comprehensive explanations of disaster preparedness and featuring resource persons from students representing various health professions, thereby promoting an interprofessional learning approach. These podcasts were uploaded to YouTube and made publicly accessible to broaden outreach and ensure wider community engagement.

The disaster preparedness podcast developed by students from multiple health professions covered hazard identification, early warning systems, evacuation steps, first aid, and community preparedness planning. The podcast was distributed to the intervention group via an Android-based platform and uploaded to YouTube for public access. Preliminary findings in Padang showed improved preparedness outcomes, justifying replication and comparison with a Bandung cohort. The intervention group received the podcast, whereas the control group did not receive any podcast-based materials.

The objective of this study is to compare the effectiveness of podcast-based Interprofessional Education (IPE) and a handbook in improving health students' knowledge and attitudes toward disaster preparedness.

METHODS

Study design

This study adopted a quantitative design with a quasi-experimental approach using a control group. It was conducted at the Poltekkes Kemenkes Padang and Poltekkes Kemenkes Bandung through online questionnaires administered between October and November 2024. Two groups were included: an intervention group comprising students from Poltekkes Kemenkes Padang and a control group comprising students from Poltekkes Kemenkes Bandung.

Data source and sampling procedures

The sample size was calculated using the Lemeshow formula, resulting in 200 respondents. Sampling for the control group followed a 1:2 ratio, producing a sample size equal to half that of the experimental group (100 respondents). A non-probability purposive sampling technique was applied. Participants were selected as representatives from various health-related study programs within each institution. Eligible participants were actively enrolled students who completed the assigned intervention (podcast or guidebook), provided informed consent, and completed the questionnaire. Students who did not complete the intervention, submitted incomplete responses, withdrew from the study, or had prior formal disaster preparedness training were excluded.

Variables of the study

The study involved an intervention group that received a podcast on disaster prevention and a control group that received the Health Crisis Management Guidelines for Disasters (PKKB). The outcomes measured were based on responses to the questionnaire completed by both groups after the intervention.

Measurement and instruments

Data were collected via an online questionnaire distributed to respondents using Google Forms. The questionnaire had previously undergone pilot testing to ensure its validity and reliability.

Data Collection

In the experimental group, students at Poltekkes Kemenkes Padang received a treatment consisting of listening to a podcast on disaster prevention in a single session

lasting approximately 30 minutes, after which they were given the prepared questionnaire. In contrast, the control group at Poltekkes Kemenkes Bandung was provided only with the Health Crisis Management Guidelines for Disasters (PKKB) and was immediately asked to complete the same questionnaire. The data collection process lasted less than one week.

Ethical consideration

Ethical approval for this research was obtained from the Research Ethics Committee of the Faculty of Medicine, Andalas University (Approval No. 459/UN.16.2/KEP-FK/2023, issued on August 29, 2023).

Data analysis

Data were analyzed through univariate and bivariate procedures, with hypotheses tested using the Mann–Whitney test due to the non-normal distribution of the data. All statistical analyses were performed using SPSS (Statistical Package for the Social Sciences).

RESULTS

Characteristics of the Study Respondents

This study was conducted at two sites while taking into account participants' characteristics, including age and gender.

Table 1. Distribution of Respondents by Age and Gender

Characteristics	Padang		Bandung	
	n	%	N	%
Age (years)				
18	0	0.0	1	1.0
19	8	4.0	4	3.8
20	74	37.0	8	7.7
21	103	51.5	30	28.8
22	14	7.0	43	41.3
23	1	0.5	12	11.5
24	0	0.0	1	1.0
25	0	0.0	1	1.0
Mean ± SD	20.63 ± 0.70		21.55 ± 1.09	
Gender				
Male	22	11.0	14	13.5
Female	178	89.0	86	82.7
Total	200	100	100	100

Based on Table 1, the age composition of respondents shows that students at the Health Polytechnic of the Ministry of Health (Poltekkes Kemenkes) Padang were predominantly 21 years old (51.5%), whereas those at Poltekkes Kemenkes Bandung were mostly 22 years old (41.3%). The mean age of respondents in Padang was lower (20.63 ± 0.68 years) than in Bandung (21.55 ± 1.25 years). The gender distribution indicated that the majority of respondents in both locations were female, with a higher proportion in Padang (89.0%) compared to Bandung (82.7%).

Univariate Analysis

A univariate analysis was performed to compare the mean knowledge scores of students at Poltekkes Kemenkes Padang, who constituted the experimental group and received education through a podcast, with those of students at Poltekkes Kemenkes Bandung, who served as the control group and used the *Guidelines for Health Crisis Management in Disasters (PKKB)*.

Based on the data presented in Table 2, the knowledge level of students at Poltekkes Kemenkes Padang had a mean score of 14.32, with a median of 15.00 and a standard deviation of 0.883. This indicates that, overall, the students in Padang demonstrated

relatively high knowledge, with a fairly homogeneous distribution of scores. In contrast, students at Poltekkes Kemenkes Bandung obtained a lower mean score of 12.65, with a median of 13.00 and a standard deviation of 2.537, reflecting a knowledge level 1.67 points lower than that of the Padang students and showing greater variation in score distribution.

Table 2. Mean Knowledge Scores of Students at Poltekkes Kemenkes Padang and Poltekkes Kemenkes Bandung Using Podcast and Book Media

Statistical Parameter	Knowledge of Poltekkes Kemenkes Padang Students	Knowledge of Poltekkes Kemenkes Bandung Students
Mean	14.32	12.65
Median	15.00	13.00
Standard Deviation	0.883	2.537

Note: Analysis conducted using SPSS 2024

Table 3. Mean Attitude Scores of Students at Poltekkes Kemenkes Padang and Poltekkes Kemenkes Bandung Using Podcast and Book Media

Statistical Parameter	Attitude of Students at Poltekkes Kemenkes Padang	Attitude of Students at Poltekkes Kemenkes Bandung
Mean	66.78	66.25
Median	68.00	68.00
Standard Deviation	7.595	8.642

Statistical Test: SPSS, 2024

Based on the results of the descriptive statistical analysis, the attitude of students at Poltekkes Kemenkes Padang showed a mean score of 66.78, with a median of 68.00 and a standard deviation of 7.595. These findings indicate that, overall, students in Padang demonstrated a generally positive attitude, with a relatively moderate level of variability. In contrast, the attitude of students at Poltekkes Kemenkes Bandung had a slightly lower mean score of 66.25, with the same median (68.00) and a standard deviation of 8.642. The larger standard deviation in the Bandung group suggests greater variability in attitudes compared to the Padang students.

Bivariate Analysis

Bivariate analysis was conducted to determine the differences in knowledge and attitudes between the experimental and control groups. Based on the normality test using the Kolmogorov–Smirnov method, the significance value indicated that the data were not normally distributed ($p < 0.05$). Therefore, the Mann–Whitney test was used as the statistical test.

Table 4. Differences in Knowledge and Attitude Scores Between the Experimental and Control Groups Using Podcast and Book Media

Variable	Group	n	Mean Rank	p-value
Knowledge	Experimental	200	174.41	0.000
	Control	100	102.69	0.000
	Total	300	—	—
Attitude	Experimental	200	151.74	0.725
	Control	100	148.02	0.725
	Total	300	—	—

Statistical Test: Mann–Whitney, SPSS 2024

Based on the statistical results presented in Table 4, students' knowledge scores showed a significant difference between the experimental and control groups. The experimental group, consisting of 200 students who received the podcast intervention, had a mean rank of 174.41. In contrast, the control group, comprising 100 students who

received the book-based intervention, had a mean rank of 102.69. The p-value of 0.000 (<0.05) indicates that this difference is statistically significant, suggesting that the use of podcasts in the experimental group had a positive effect on improving students' knowledge compared with the use of books in the control group.

For the attitude variable, the experimental group using podcasts achieved a mean rank of 151.74, which was slightly higher than the control group's mean rank of 148.02. However, the p-value of 0.725 (>0.05) indicates that this difference was not statistically significant. This finding suggests that the use of podcasts in the experimental group and books in the control group did not have a meaningful impact on students' attitudes.

DISCUSSION

This study was conducted among students from all departments at the Poltekkes Kemenkes Padang and Poltekkes Kemenkes Bandung. The majority of respondents in Padang were female (89.0%), as were those in Bandung (82.7%). Statistical analysis revealed that the mean knowledge score on disaster preparedness among students using podcasts in Padang was 14.32, whereas students in Bandung who used the Guidelines for Managing Health Crises in Disasters scored an average of 12.65.

The Mann–Whitney test comparing the experimental and control groups yielded an asymptotic significance value (two-tailed) of 0.000, indicating that the alternative hypothesis was accepted and the null hypothesis rejected ($p < 0.05$). This demonstrates a significant difference between students in Padang who used podcasts and students in Bandung who used books. Questionnaire data showed that, among Padang respondents, the lowest correct response rate concerned factors influencing obstacles, with 174 students (87.0%) answering correctly and 26 (13.0%) answering incorrectly, a gap of 74%. In Bandung, the lowest correct response rate related to the best way to resolve interprofessional conflicts was with 75 students (72.1%) answering correctly and 25 (24.0%) answering incorrectly, a difference of 48.2%. The highest correct response rate among Padang respondents was for the item on interprofessional training for disaster preparedness (199 students, 99.5%), while in Bandung, the highest was for interprofessional education (IPE), with 92 students (88.5%) responding correctly and 8 (7.7%) incorrectly.

The findings suggest that the significant difference between students exposed to podcasts and those using books stems from the engaging nature of audio-visual media. Podcasts combine narration, audio, and images, allowing students to visualize content more easily and prepare for discussions. They also serve as a medium for strengthening students' connection with their academic environment, offering inspiring stories that motivate learners to excel academically and enhance personal skills.¹⁴ Vogt et al. (2020) similarly found that participants who used podcasts achieved higher scores and reported greater satisfaction. In another study on Ececast podcasts, students rated their satisfaction and engagement as high, despite technical challenges such as poor signal quality or limited device memory.¹⁵ Goldman (2018) emphasized that podcasts do not replace textbooks, quizzes, or other materials; instead, they act as meaningful supplements to learning. This aligns with Frydenberg (2006) and Nathan & Chan (2007), who identified three purposes for podcast use in education: increasing flexibility, enhancing accessibility, and enriching the overall learning experience.¹⁶

Within this study, the results indicate a positive influence of podcasts based on the IPE approach on disaster preparedness behaviors. Their flexibility enables students from diverse professional backgrounds to access materials independently, regardless of time and place, thereby strengthening interprofessional collaboration. Furthermore, the accessibility of podcasts benefits students with heavy academic schedules, while the engaging narrative format supports deeper understanding and contextualization of disaster preparedness content.¹⁷

These findings reinforce the existing theory that podcasts are not merely tools for information dissemination but also instruments that foster learning engagement. Nevertheless, technical barriers such as limited internet connectivity and insufficient storage capacity remain challenges. Addressing these may require optimizing file size, providing offline access, or integrating podcasts with lightweight online learning platforms. Successful implementation of podcasts for disaster preparedness education, therefore, depends on content quality, technological accessibility, and adequate infrastructure.

Regarding attitudes, the average score among Padang students using podcasts was 66.78 (SD = 7.595), while Bandung students using books scored 66.25 (SD = 8.642), a difference of only 0.53. The Mann–Whitney test produced an asymptotic significance value (two-tailed) of 0.725, indicating that the null hypothesis was accepted ($p > 0.05$). Thus, no significant difference was found between the two groups' attitudes toward disaster preparedness. The questionnaire items with the lowest response rates addressed the notion that disaster readiness could be handled by a single profession: Padang respondents scored an average of 2.66, compared to 2.77 in Bandung. The highest response rate concerned the statement that, within IPE, food security is the responsibility of nutrition professionals; the mean scores were 4.71 in Padang and 3.53 in Bandung, a gap of 0.17.

The minimal difference in attitude scores implies that the type of medium—podcast or book—did not substantially influence students' attitudes. This finding aligns with Neneng et al. (2021), who reported no significant effect of health education interventions on respondents' attitudes ($p > 0.05$), despite significant gains in knowledge.¹⁸ The control group in this study received the material only once, in book format with text and images. According to Yaumi (2018), reading alone retains approximately 10% of presented information, while visual elements increase retention to about 30%.¹⁹ This may explain the improvement in knowledge among control group participants, even though limited stimulus variety and lack of interactivity hindered attitude change. By contrast, podcasts offer advantages such as flexible access, repeated exposure, and a narrative style that enhances learner engagement.^{20,21}

The absence of significant attitude differences may stem from several factors. First, the intervention duration and exposure frequency were limited, which may not have been sufficient to foster new attitudes. Second, attitudinal change often requires affective stimulation or direct experience, such as simulations or fieldwork, which were not included in this intervention. Third, students' prior experiences and baseline attitudes toward disaster preparedness may have minimized observable changes.²²

Although the intervention significantly improved students' attitudes toward disaster preparedness, it is important to clarify the interprofessional component of the podcast. The podcast incorporated interprofessional interactions by featuring students from different health professions who jointly explained key concepts and demonstrated coordinated roles in the audiovisual episodes. However, these interactions were presented in a one-way video format, enabling learners to observe but not actively participate in the collaborative process. As a result, the interactive elements emphasized in the Interprofessional Education and Collaborative Practice (IPE-CP) framework were not fully achieved. Future interventions may enhance collaborative competencies by integrating interactive IPE activities alongside one-way audiovisual materials.²³

In conclusion, while both podcasts and books proved effective for improving knowledge, shifting attitudes requires additional strategies—such as blended learning that combines educational media with hands-on practice, group discussions, or case studies. Such approaches are more likely to bridge the gap between knowledge acquisition and attitudinal change, ultimately fostering actionable disaster preparedness

behaviors.

A key strength of this study lies in its use of a podcast format that fostered interaction and collaboration among students within the Interprofessional Collaboration Practice (IPE-CP) framework. By allowing learners from diverse health disciplines to engage with shared content, the podcast promoted cross-professional dialogue and enhanced understanding of disaster preparedness concepts.

However, one limitation is that the duration of the podcast tended to be lengthy, which may have constrained listeners' ability to focus on essential points, and some key messages may not have been fully conveyed.²⁴ Future studies should explore more concise formats or modular episodes to ensure optimal retention of core content.

The findings have clear implications for practice. Podcasts can serve as a flexible, accessible learning tool to integrate IPE-CP principles into disaster preparedness education, complementing other instructional approaches such as simulations, case discussions, or blended learning.²⁵ When supported by well-structured content and appropriate technical design, podcasts can become an effective medium for cultivating both knowledge and interprofessional collaboration skills essential for health students preparing to respond to disaster situations.

Several uncontrolled external factors may have influenced the outcomes of this study. Students' prior experiences with disasters, their involvement in campus-based emergency response organizations, and participation in extracurricular activities related to community service or leadership may independently shape attitudes and behaviors toward disaster preparedness.²⁵ These factors could diminish the observed effect of the podcast intervention, potentially contributing to the non-significant differences found between groups. Recognizing these contextual influences is essential for interpreting the findings, as they highlight the need for more rigorous control of confounding variables in future studies.

CONCLUSION

This study successfully developed a disaster preparedness podcast grounded in the Interprofessional Collaboration Practice (IPE CP) framework, designed to meet the learning needs of students at the Ministry of Health Polytechnic (Poltekkes) Padang. The findings indicate that the podcast significantly enhanced students' knowledge compared with a book-based intervention ($p = 0.000 < 0.05$), although it did not produce a significant change in attitudes ($p = 0.725 > 0.05$). These results suggest that podcasts can serve as a highly effective medium for improving disaster preparedness knowledge among students and should be considered as a complementary strategy within interprofessional education initiatives.

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