

Comparing the effectiveness of educational videos and booklets in enhancing knowledge about odontogenic infections and awareness about seeking dental treatment

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Abstract

Objective: Odontogenic infections are common but often disregarded due to a lack of awareness and knowledge about oral health. Effective health promotion through educational media can enhance understanding and encourage better oral hygiene practices. This study at Universitas Airlangga Academic Dental Hospital is conducted using visual and audiovisual media to educate patients, aiming to assess the efficacy of these media in increasing knowledge and awareness about odontogenic infections, ultimately promoting dental treatment-seeking behaviour.

Material and Methods: One hundred eighty-two participants from the Universitas Airlangga Academic Dental Hospital completed the questionnaires to assess knowledge and awareness score increase using either videos or booklets.

Results: The statistical test results using the non-parametric Wilcoxon test indicate that both methods influenced the knowledge and awareness scores. The Mann-Whitney test showed $P=0.000$, which means that the post-test scores of both methods were significantly different. Regarding N gain analysis, the increase in knowledge and awareness was higher when using booklets, with average scores of 2.5585 and 1.7457, compared to using videos, which resulted in increases of 0.3680 and 0.1683, respectively.

Conclusion: Booklets were more effective than videos in increasing knowledge about odontogenic infections and awareness of seeking dental treatment.

Keywords: Educational booklet; Educational video; Odontogenic infection; Oral health; Patient education

1. Introduction

Odontogenic infection originates from the pulps or periodontal pathology and affects the alveolar bone. The primary aetiology is dental caries, but sometimes pericoronitis, periodontal pockets, or exodontia [1, 2]. The 2018 Indonesia's national-scale data (RISKESDAS) reported [3] the prevalence of odontogenic infections resulting in 14% of abscesses, 88,3% of dental caries, and 74,1% of periodontitis. According to studies, it is clear that this infection has a substantial effect on individuals' personal growth and development, psychological well-being, productivity, and social interactions

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[4]. However, many people remain unaware of the risks and may disregard them due to their incorrect perception that these infections may not be life-threatening.

Oral health knowledge level in Indonesia varies. Gayatri et al. [5] stated that the knowledge level in Malang, Indonesia, was high. While in Jakarta, Indonesia, it was low. These varying results are influenced by factors such as age, occupation, educational level, and income [6]. This lack of knowledge about oral health problems may have led to low awareness of seeking dental treatment. Data obtained from the 2018 RISKESDAS survey showed that 95.5% of individuals had never received treatment for odontogenic infections. Only 1 out of 5 Indonesians receive dental treatment when they have problems with their teeth and mouth [3]. Furthermore, there have been inadequate socialization efforts to educate the public about oral health.

As the gateway to health, oral health is often overlooked. Males are most likely to have poorer oral health habits. Unlike females who consider oral health as a significant factor affecting their quality of life, inadequate oral health can result in discomfort and negatively affect their appearance [7, 8]. Elderlies were also associated with poor oral health knowledge [9]. Their physical weakening may decrease their ability to process health information [10]. Similarly, their educational level may also be affected. In contrast, many younger people have better oral health knowledge since they are more likely to learn this at school.

Along with this fact, health promotion needs to be done to improve the public's knowledge and awareness by using various educational media. Universitas Airlangga Oral and Maxillofacial Surgery Department Community Services attempted to give visual and audiovisual media, i.e. booklets and videos, to patients at Universitas Airlangga Academic Dental Hospital.

This study aims to determine their questionnaire score increase to assess the media efficacy towards increasing knowledge about odontogenic infections and awareness to seek dental treatment. After all, it is hoped that the promotion of oral health can change the public's behaviour in maintaining oral hygiene [11].

2. Material and Method

The design for this study was a questionnaire survey using pre-test and post-test designs collected in Universitas Airlangga Academic Dental Hospital from July until September 2021. This study was approved by the ethics committee of Dental Medicine Universitas Airlangga (10/UN3.9.3/Etik/PT/2022 and 11/UN3.9.3/Etik/PT/2022). Based on the calculated Lemeshow formula and 100% response rate, the total participants included in this study were 182 patients aged 17-65 without mental disorders, with sufficient education, and who were able to engage in the study. Healthcare workers and students from Universitas Airlangga Academic Dental Hospital were excluded from this study. Informed consent was obtained from all individual participants included in the study

Table 1 Participants' Demographic

Variables	Category	N	Percentage
Sex	Male	51	28
	Female	131	72
Age	17-25 years old	82	45
	26-35 years old	79	43.4
	36-45 years old	21	11.6
Educational Level	Middle School	1	0.6
	High School	113	62
	Diploma 1	4	2.2
	Diploma 3	4	2.2
	Bachelor / Bachelor of Applied Science Degree	60	33

Participants were given educational videos or booklets and had to fill out the pre-test and post-test questionnaires. The questionnaire assessed participants' knowledge of odontogenic infections and their awareness of seeking dental treatment. The questionnaire was created based on the theory of "Context, Input, Process, Product (CIPP)". The CIPP evaluation framework comprised four distinct evaluation elements: context assessment, input assessment, process assessment, and product assessment. The questionnaire has passed the validity and reliability test. The details of pre-test and post-test questions are listed in [Tables 2 and 3] below.

Table 2 Educational Video Questionnaire

No	Educational video	
	Pretest	Posttest
1	Virus played a very important role in causing toothache	
2	Germs that cause toothache spread through blood vessels and lymph node	
3	Germs that cause toothache cannot spread to other parts of the body, such as brain and heart	
4	Dizziness during toothache is a sign of resistance of the body's defence system to germs	
5	Root canal treatment is done when a person experiences toothache	
6	Teeth that look fine and healthy are definitely not causing toothache	
7	I will go to the dentist if i feel pain in my teeth	
8	I go to the dentist only if i experience toothache	
9		Educational video increases my awareness to go to the dentist
10		Educational video increases my knowledge about toothache

Table 3 Educational Booklet Questionnaire

No	Educational book	
	Pretest	Posttest
1	Oral health affects our general health	
2	Chipped tooth causes tooth infection	
3	If not appropriately managed, tooth infection will spread via the most difficult routes passed by bacteria	
4	Odontogenic infection can spread to the mouth surrounding area and causes other illnesses such as stroke, even death	
5	Periodontitis is characterized by gums redness and pain in the tooth when tapped	
6	Tooth filling causes pain when drinking, gargling, and eating sweets	
7	Headache relates to oral diseases	
8	Pregnant women who ignore their oral health will have a higher risk of low-birth-weight baby	
9	High protein diet is beneficial to treat tooth infection because protein helps in healing process	
10	Vitamin affects healing process during oral cavity inflammation	
11	I will go to the dentist if I feel pain in my teeth	
12	I go to the dentist only if I experience toothache	
13	I will visit the dentist regularly even if I do not have any problems of my teeth	
14		Educational book is easy to understand

2.1. Scoring and Statistical Analysis

Participants' questionnaires were scored. Data collected will then be processed using IBM SPSS Version 22 for Windows with a significance level of 0.05 to determine whether educational booklets or videos are more effective in increasing participant knowledge about odontogenic infection and awareness to seek dental treatment. The tests employed in this study include normality test (Kolmogorov Smirnov), Wilcoxon, Mann-Whitney U test, and N-gain score.

3. Results

The study involved 182 participants, evenly divided into two groups, with 91 participants in each group. 72% were females, with most 17-25 years old. 62% of them were high school graduates. Knowledge and awareness pre-test and post-test average score differences are also shown in [Table 4].

Table 4 Statistical Analysis

Variables	Category	Knowledge Average Pre and Posttest Score Difference		Awareness Average Pre and Posttest Score Difference	
		Book	Video	Book	Video
Sex	Male	2.4	0.4	1	0.2
	Female	2.5	0.5	0.9	0.2
Age	17-25 years old	2.3	0.6	1	0.2
	26-35 years old	2.5	0.4	0.83	0.2
	36-45 years old	2.5	0.3	1	0.1
Educational Level	Middle School	0	0.2	0	0.2
	High School	2.2	0.2	0.85	0.3
	Diploma 1	2.5	0.5	1	0.2
	Diploma 3	2.7	0.5	0.9	0.2
	Bachelor / Bachelor of Applied Science Degree	2.4	0.7	1	0.2
Average Score		2.4366	0.353	0.2931	0.196
P-value*		0.015	0.000	0.000	0.007

*Sig \leq 0.05

Questionnaires' scores were averaging from 1.75 to 8.41. Participants' average knowledge of odontogenic infection and awareness of seeking dental treatment scores were higher when educational booklets were used rather than videos.

Using the Kolmogorov-Smirnov test, participants' knowledge and awareness scores in both groups were not normally distributed ($P=0.000$). Using the Wilcoxon test, there was a difference in scores between the pre-test and post-test ($P=0.015$ and $P=0.000$ for the knowledge aspect; $P=0.015$ and $P=0.000$ for the awareness aspect).

Using the Mann-Whitney U test, there was a significant difference between both methods' post-test scores ($P=0.000$) (Sig. $P\leq 0.05$).

The N-gain test result showed a mean score of four components: knowledge of odontogenic infection using video, knowledge of odontogenic infection using a booklet, awareness to seek dental treatment using video, and awareness to seek dental treatment using a booklet. The mean score was 0.368, 2.5585, 0.1653, and 1.7457, respectively.

4. Discussion

Odontogenic infection knowledge in Indonesia is still considered low. Oral health knowledge is also related to patients' awareness or behaviour [12]. Compared to males, females have better knowledge and awareness levels, judging by their frequency and technique of tooth brushing and dental visits [13]. It is known that female patients have greater demands on their physical appearance and dental aesthetics. Hence making them feel more sensitive to the presence of dental caries and better oral health habits [14]. At the same time, males are more likely not to have seen a dentist in the past year and are less worried about how oral issues affect their quality of life [15]. Males are prone to neglecting their oral health, practising inadequate oral hygiene habits, and facing elevated risks of periodontal disease, oral cancer, and dental trauma [16].

Furthermore, in comparison to females, males tend to seek oral treatment more frequently for acute problems rather than preventive care. Conversely, females exhibit more favourable perspectives towards dental visits, possess a greater understanding of oral health, and demonstrate better oral health practices in comparison to men [7]. This is evident from the number of female participants, which was 72% of the total.

The highest number of participants by age group was in the range of 17-25 years, with a percentage of 45%. Based on research by Hidana *et al.*, the age group uses health services a lot. The late adolescent category is a period of productive age where awareness of seeking health services is high [17]. As people get older, their comprehension and mindset will develop so that they will have the ability to acquire good knowledge. However, elderly have almost a 2% greater risk of low oral health knowledge.

Participants with a bachelor's degree achieved the highest scores in both forms of media. Indeed, the level of individual education significantly affected patient visits to the dental clinic [18]. A study by Chen *et al.* [12] stated that children from well-educated families were more likely to have good oral health knowledge and regular dental visits. Also, it would be easier to receive information about objects or related knowledge if their knowledge level is high [9, 19].

There are many media to promote health. In this study, booklets were used because they are easy to obtain, carry, learn, and do not require special tools, making them accessible to everyone. Books as visual media are more economical and affordable compared to audiovisual media which requires advanced technology to use [20]. Since books provide information through images and words, participants could capture the information better. Furthermore, not all participants could comprehend information from the video because the message intended to be conveyed continued to shift. In accordance with these theories, it was observed that participants' knowledge scores increased by 2.55 when using a booklet, which was higher than the 0.36 increase in video. Similarly, the awareness scores increased by 1.74 with booklets, while videos only led to a 0.16 increase.

This study's limitations are that since most of the participants are female, their tests may have scored higher than males. Also, since the participants are only Universitas Airlangga Academic Dental Hospital patients, the results of this study are less representative of the overall population.

5. Conclusion

Within the study's limitations, it can be concluded that booklets were more effective than videos in increasing knowledge about odontogenic infections and awareness of seeking dental treatment. This study highlights the potential to enhance oral health promotion initiatives for the Indonesian population by developing educational materials, such as booklets or interactive videos, tailored to different age groups and educational levels. This approach could improve oral health knowledge and awareness, ultimately leading to better oral health outcomes.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors report no conflict of interest.

Statement of ethical approval

This study was approved by the ethics committee of Dental Medicine Universitas Airlangga (10/UN3.9.3/Etik/PT/2022 and 11/UN3.9.3/Etik/PT/2022).

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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