



(RESEARCH ARTICLE)



## Effectiveness of video-based dental health education to improve maternal knowledge in army wives association of Maluku

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### Abstract

**Background:** Children are the largest group of people with dental and oral problems. The parental role is crucial in maintaining good dental and oral health, for children are still dependent on their parents and lack psychological maturity. However, the prior study found poor maternal knowledge regarding dental and oral health.

**Objective:** to assess the effectiveness of dental health educational video in improving knowledge among mothers in the Army Wives Association of Maluku to prevent dental caries and increase good oral health-related behaviors in children.

**Methods:** This quasi-experimental study involved the members of the Army Wives Association in Ambon, Maluku. The respondents were divided into three groups: having no child, having children aged 0-14 years, and having children aged >14 years. Education was delivered using a dental health educational video and flyers. Paired t-test was used for study analysis.

**Result:** Most respondents (50.7%) had a bachelor's degree. The mean total score improved (0.0852) from the pre-test to the post-test, indicating that the dental health educational video could significantly improve maternal knowledge ( $\alpha=0.001$ ;  $p<0.005$ ).

**Conclusion:** Video-based dental health education improved maternal knowledge.

**Keywords:** Children; Oral and dental health; Parents; Knowledge; Video

### 1. Introduction

Dental caries is a chronic disease caused by a combination of factors, primarily bacteria [1]. and has become a global health problem. According to the result of Indonesia Basic Health Research in 2018, approximately 57.6% of the Indonesian population had dental and oral problems, but only 10.2% of them received medical treatment [2]. The proportion of dental and oral problems was highest in those aged 5-9 years (67.3%), but only 14.6% had dental visits for treatment [3].

Children with good dental knowledge are less likely to have dental problems. The parental role is the most predominant aspect of maintaining good dental and oral health. Parents should be responsible for their child's oral health care since young children are not able to brush their teeth properly and lack psychological maturity [4,5].

The role of mothers in improving children's oral health habits and status has been promoted. Nevertheless, the preliminary survey found a lack of dental knowledge among the majority of mothers in Army Wives Association, Ambon,

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Maluku, particularly regarding stages of teething and dental caries in children. Accordingly, the present study was conducted on the same respondents to assess the effectiveness of dental health educational video in improving their knowledge to prevent dental caries and increase good dental health-related behaviors in children.

## 2. Material and methods

This quasi-experimental study was conducted on 4 November 2021 and involved the members of the Army Wives Association in Ambon, Maluku, who were willing to participate in the study. They were divided into three groups: having no child, having children aged 0-14 years, and having children aged >14 years. The study consisted of three parts: data collection, education, and sustainability program development. Education was delivered using a dental health educational video and flyers that provided information about stages of teething and good oral hygiene instructions. The success indicator in the study was the improvement in the post-test scores after education compared to the pre-test scores. Paired t-test was used for comparing pre-and post-test scores, with a confidence level of 95%, and analyzed using SPSS ver.21.

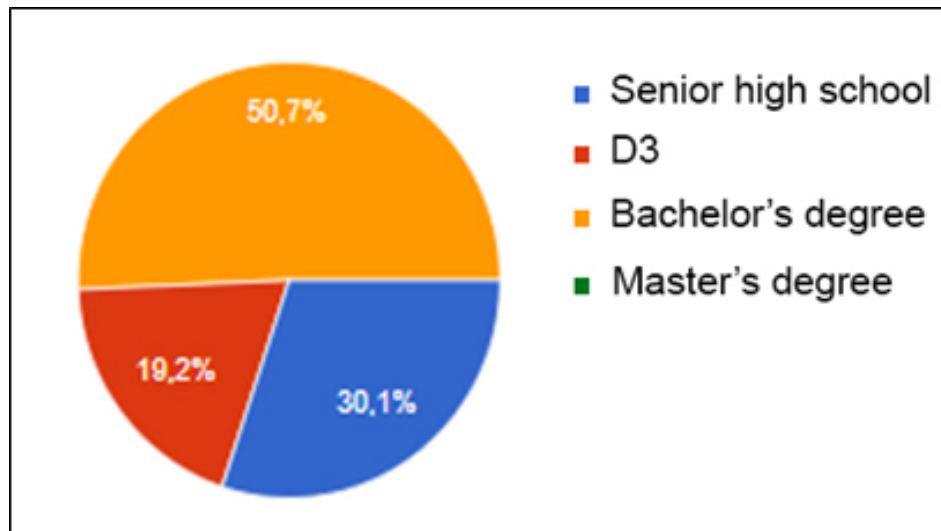
## 3. Results

Figure 1 Shows the respondent's level of education. Most respondents (50.7%) had a bachelor's degree

Table 1 shows that the highest mean pre-test score (2.81) was at the second item of the questionnaire, while the lowest score was at the 13th item (1.02). The highest mean post-test score was at the 4th item of the questionnaire (3.22), while the lowest was at the 13th question (1.03). The mean pre- and post-test total scores are presented in Table 2. The mean total score improved (0.0852) from the pre-test to the post-test, indicating that the dental health educational video could significantly improve parental knowledge ( $\alpha=0.001$ ;  $p<0.005$ ).

**Table 1** Item-wise pre- and post-test knowledge score

No	Item	Mean		Improvement in knowledge score	Sig. (2-tailed)
		Pre-Test	Post Test		
1	Oral hard tissue diseases	1.7835	1.9381	0.1546	0.013
2	Primary factors influencing dental caries in children	2.8144	2.8660	0.0516	0.032
3	Stages of teething	2.6598	2.7629	0.1033	0.020
4	Eruption time of the first primary teeth	2.1237	3.2165	1.0928	0.000
5	Eruption time of the first permanent molar	1.9278	1.9691	0.0413	0.040
6	Nonsuccedaneous teeth	1.196	1.4330	0.0414	0.007
7	The importance of primary teeth	1.3711	1.5052	0.1341	0.032
8	The difference between primary and permanent teeth	1.4742	2.0928	0.6186	0.000
9	Proper toothbrushing technique	2.7629	2.7835	0.0206	0.005
10	Recommended toothpaste for children	2.1649	2.7216	0.5567	0.000
11	The appropriate time for toothbrushing	2.7835	2.8247	0.0412	0.025
12	Good oral hygiene practices	2.7629	2.8763	0.1134	0.032
13	Regular dental visits for maintaining oral health in children	1.0206	1.0316	0.011	0.012



**Figure 1** Chart showing the educational level of respondents

**Table 2** Comparison of total scores before and after education

Method of education	Mean		Improvement in knowledge score	Sig. (2-tailed)
	Pre-test	Post-Test		
Educational video about stages of teething and dental health in children	2.1479	2.2331	0.0852	0.001

#### 4. Discussion

Early childhood caries (ECC) remains a health problem in some countries including Indonesia [6]. Poor maternal and children's oral hygiene is contributing factor to the high prevalence of ECC. Oral and dental care in children could be delivered by providing communication, information, and education to their parents. Active involvement of parents is crucial to encourage their children to get more independent in maintaining optimal oral health [7]. The present study found poor maternal knowledge among mothers with a bachelor's degree. This finding was not in agreement with the finding of Susi *et al.* which showed that the prevalence of ECC was lower among children whose mothers had higher education levels.

Maternal level of education affects their knowledge, attitude, and behavior. Higher educated mothers can more appropriately find, grasp, and analyze information [8]. Another study by Ju *et al.* reported that maternal education was associated with certain factors such as affordability, distance, availability of transportation, linguistic barrier, and culture appropriateness in delivering or receiving health education [9]. A survey carried out by Australia's national statistical agency showed that the higher the educational attainment, the higher the employment rate. For example, full-time employment rates increased to 63% for those with a bachelor's degree or higher. Accordingly, the mother's educational attainment could reflect her socioeconomic status [10].

Education for respondents was delivered using PowerPoint, educational video, and dental flyers. An increasing trend of technology use offers the opportunity to learn more, perform better, speed up the learning pace, and have a satisfactory health experience. A tutorial video is multimedia communication that may present facts, ideas, attitudes, as well as experiences to the learners in any creative way such as drama or simulation. Learning through video is remarkably effective for adult education [11]. A study by Ramadhani *et al* reported that two major concerns in child dental health included the high prevalence of caries and poor maternal knowledge regarding dental health. To improve their knowledge, mothers should learn and get reliable information about oral and dental health. An epidemiological study showed that flyers and videos may be effective media to deliver information to mothers in the working area of Keputih Primary Health Center, Surabaya [12].

In developing countries, community empowerment is included in health promotion program planning. A systematic planning approach is required for program development. Oral health promotion using multimedia video could be an effective tool to establish a good oral hygiene routine which leads to oral health improvement [13,14]. Initiating a disease prevention program using multimedia tools is preferable, for a multimedia learning environment may potentially enhance the audience's learning ability. Accordingly, educational video and flyers were used in the present study to promote oral health. In the multimedia learning environment, the audiences are exposed to the material in verbal and static pictures such as photos or illustrations, as well as dynamic materials such as video or animation. Audience understanding may be enhanced by the addition of visual forms of presentation [15].

Social cognitive theory has been broadly employed in general health behaviors setting, including patient adherence to medication, weight loss, physical activities, drug abuse, and sexual behaviors. In a systematic review with meta-analysis, social cognitive theory accounted for 31% of the variance in physical activity. In addition, it also revealed that the 'self-efficacy' and 'goals' constructs were consistently related to physical activity, while other constructs such as outcome expectations and socio-cultural factors were not [16].

According to the cognitive theory, the learner has to engage in five cognitive processes for meaningful learning to occur in the multimedia environment: (1) selecting relevant words for processing in verbal working memory, (2) selecting relevant images for processing in visual working memory, (3) arranging selected words into a verbal model, (4) arranging selected images into a pictorial model, and (5) integrating the pictorial and verbal representations and also with relevant previous knowledge activated from long-term memory. It is also explained that human possesses three stores structure of memory known as sensory memory (i.e eyes and ears), working memory (i.e images and sounds), and long-term memory. Ears and eyes in sensory memory are the main elements to hold multimedia presentations such as videos and flyers. Therefore, sensory memory is the main channel sensor that allows knowledge to enter, while working memory is a cognitive system used for processing information (sounds and images) that enters through the eyes and ears in active consciousness. After sound images of words or background music and visual images of pictures, videos, and animation are processed, verbal and pictorial models are constructed. The last memory store is long-term memory which is used to hold a large amount of knowledge obtained through a prior integrated process [17]. Clear and interesting learning experiences may improve understanding. The use of educational video as electronic learning media is considered beneficial for it may be used as a discussion tool, involves multi-sensory experiences, and is more interesting with sounds and animation. Moreover, it is easily accessible, controllable, and replayable, and also could reach a higher number of learners. Some supporting facilities required in this learning method include a projector, laptop or video player, and electricity availability. Video may also be used in many educational topics, learning models, and domains of cognitive, affective, and psychomotor learning. Cognitively, video has a great potential to improve deep understanding of the learning process[18].

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## 5. Conclusion

The use of video and flyers in delivering children's dental health education significantly improved maternal knowledge.

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## Compliance with ethical standards

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### *Disclosure of conflict of interest*

The published in the data manuscript is not conflict interest to any partyer between the two authors

### *Statement of informed consent*

Written informed consent was collected from individuals and verbal consent form was obtained from subject.

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