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Digital poster usage on increasing parents' knowledge of dental and oral health maintenance

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ABSTRACT

Background: tooth decay is a damage on teeth from email to dentin. Tooth decay will happen because less knowledge of every person and they need dental health education to improve their knowledge. To give education, it needs digital poster as a media. Digital poster have some aspects like illustration, typography, and color. That aspects can make digital poster more attractive. The goals of this research is to analyze dental health knowledge of parents before and after giving dental health education with digital poster. Research Method: socialization with pre and post design to 37 respondents. Results: data is normally distributed for both variables, namely the pre test of 0.033 0.05. There is a connection between pre test and post test because the pre test value is 63.38 < post test 81.08 and the value of Sig. 0 < 0.05. Conclusion: there is a impact from digital poster to improve dental health knowledge of parents in 03 Elemntary School East Cempaka Putih.

INTRODUCTION

Dental and oral health is a public health issue that requires comprehensive care due to its potentially widespread impact (Purnama et al., 2024). Therefore, preventive measures must be taken before dental and oral health problems arise. The most common dental and oral health issue in Indonesia is dental caries (Lestari, 2019). Dental caries is localized damage to the tooth structure, beginning from the enamel and progressing to the dentin. The main causes of dental caries are bacteria such as *Streptococcus mutans* and *Lactobacilli*. In addition to bacteria, other contributing factors include fermentable carbohydrates, time, and the level of oral hygiene. External factors such as age, gender, environment, knowledge, population status, and behaviors related to dental health also influence the occurrence of caries (Kusuma & Taiyeb, 2020).

Research conducted in countries across America, Europe, and Asia, including Indonesia, shows that 90–100% of children under the age of 18 experience dental caries (Ismail, 2018). The 2018 Basic Health Research reported that among Indonesia's population of 267 million, individuals had an average of 4–5 problematic teeth. According to WHO standards (2018), the caries prevalence among 5–6-year-olds is 8.43%, with children aged 5 years having a dmft index > 6. Furthermore, only 10.2% of the 57.6% of the population who sought dental care actually received services. Among children aged 5–9 years, 94.7% brush their teeth daily, but only about 2.8% do so properly (Kemenkes, 2018). Parental knowledge plays a vital role in maintaining dental and oral health in early childhood. Parents' awareness of their children's dental health can be reflected through their attitudes and attention toward oral care. Good dental health during early childhood is crucial for proper development. Tooth decay in children may interfere with their dental growth later in life (Oktarina et al., 2016).

Dental health education is a planned and targeted effort aimed at improving individuals' or groups' knowledge and skills to encourage behavioral change from poor to better oral care habits. The success of dental health education depends on multiple key elements that play an important role in increasing knowledge (Bestfy, 2020). Dental health education can be supported by various media tools, one of which is the poster (Noviani et al., 2023). A poster is a printed medium that delivers health messages and

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information, usually displayed on public walls or vehicles (Apriyani & Sumerti, 2015). Posters are designed to influence a wide audience through brief messaging. Therefore, an effective poster should be attractive, simple, and convey only one main idea (Panggabean, 2015).

With technological advances, posters are no longer limited to print; they can now be produced digitally using electronic media. Digital media incorporate elements such as illustration, typography, and color—all of which determine how engaging the poster is. Illustration and typography are important visual elements in graphic design used to convey information. Hence, digital posters are selected as an educational medium to deliver oral health information in a more appealing way, making it easier for parents to understand the message (Marludia et al., 2023).

According Jumilah et al., (2013), found that the effectiveness of poster use during education sessions was demonstrated by an increase in the mean pre-test score from 5.37 to a post-test score of 8.73 after a 14-day intervention. This research on elementary school students in Saigon revealed a significant difference in knowledge before and after a 7-day and 14-day poster-based intervention. A key strength of this study was the careful observation of the effects over different time spans. However, the duration could potentially be shortened to prevent participant fatigue. Based on the issues discussed, this study aims to investigate "The Effect of Digital Poster Usage on Increasing Parents' Knowledge of Dental and Oral Health Maintenance", with the hope that parents will gain knowledge and apply it to support their children in achieving healthy teeth.

METHOD

This research used a quantitative approach, employing pre-test and post-test questionnaires. Quantitative research is based on positivist philosophy and is used to study specific samples and populations (Notoatmodjo, 2018b). The population consisted of parents of students at SDN Cempaka Putih Timur 03, Central Jakarta, totaling 50 respondents. The research instrument included a knowledge questionnaire and digital poster media used to collect data systematically, accurately, and efficiently.

RESULT

Data collection was carried out by distributing questionnaires directly by the researcher to all respondents. The research data were then analyzed using SPSS with the following results:

Table 1. Respondents' Age Distribution

Age	n	%
17-30	1	2,7
31-40	26	70,27
41-50	10	27,03
Amount	37	100

In the distribution table above, the most common age group among the study participants was 31–40 years, with 26 respondents (70.27%), followed by the 41–50 age group with 10 respondents (27.03%), and the 17–30 age group with only one respondent (2.7%).

Table 2. Pre-Test Knowlegde Distibution

No	Knowledge	n	%
1	Good	12	32,4
2	Enough	8	21,6
3	Not enough	17	46
	Amount	37	100

Based on Table 2, the highest pre-test distribution was 46% in the poor knowledge category with 17 respondents. A total of 32.4% were in the good knowledge category with 12 respondents. The lowest distribution was 21.6% in the moderate knowledge category with 8 respondents

Table 3. Post-Test Knowledge Distribution

No	Knowledge	n	%
1	Good	25	67,6
2	Enough	12	32,4
3	Not enough	0	0
	Amount	37	100

Based on Table 3, the highest post-test distribution was 67.6% in the good knowledge category with 25 respondents. A total of 32.4% fell into the moderate knowledge category with 12 respondents. The lowest distribution was 0% in the poor knowledge category, with 0 respondents.

Before conducting the bivariate analysis, it is necessary to assess the normality of the obtained data. The normality test was performed using the Shapiro-Wilk test. The data presentation is shown in the tabulation below:

Table 4. Shapiro-Wilk Test of Knowledge

Normality test	n	*p-value*
Pre test	37	0,033
Post test	37	0,072

**Shapiro-Wilk*

The tabulation above shows of 37, indicating that the sample size used was less than 50. Therefore, the decision on normality should refer to the Shapiro-Wilk column. Based on the output above, the P-value for the pre-test group is 0.033 and the *p-value* for the post-test group is 0.072. Since one of the *p-values* is < 0.05 and the other is > 0.05, according to the decision-making criteria for the Shapiro-Wilk normality test, it can be concluded that the data is normally distributed for the post-test group but not normally distributed for the pre-test group. The bivariate analysis used in this study is the Paired T-Test. This test was chosen because the data being analyzed is grouped and showed normal distribution. The results of the Paired T-Test are presented as follows:

Table 5. Paried Data Test of Pre-Test and Post-Test Knowledge

T test	Average	Deviation value
Pre Test	63,38	19,510
Post Test	81,80	6,681

**Paired Test*

Based on the output above, the average (mean) score for the pre-test was 63.38 and for the post-test was 81,08. The number of respondents in this study was 37. The standard deviation for the pre-test was 19.510 and for the post-test was 6.681. The average knowledge score of parents in the pre-test (63,38) was lower than in the post-test (81,08). This indicates that there is a descriptive difference. Next, the date needs to be flowing tabulation:

Table 6. Relationship between Pre-Test and Post-Test Knowledge Levels

Correlation Test	Sig
Pre-Test and Post-Test	0,000

The output above shows a correlation value of 0.738 with a Sig. value of 0.05. Because the Sig. value is less than the probability value, it can be concluded that there is a relationship between the pre-test and post-test.

DISCUSSION

The data obtained came from respondents who were parents of students at SDN Cempaka Putih Timur 03, totaling 37 individuals: 10 respondents were aged 41–50, 26 respondents aged 31–40, and only one respondent aged 21–30. The data were then analyzed using SPSS software to evaluate the level of

parental knowledge before and after the health education session using digital poster media. The analysis results for pre-education knowledge (pre-test) showed that 46% of respondents (17 people) had poor knowledge, 32.4% (12 people) had good knowledge, and 21.6% (8 people) had moderate knowledge. After the digital poster intervention, knowledge levels increased, with 67.6% (25 respondents) classified as having good knowledge and 32.4% (12 respondents) as having moderate knowledge. The impact of the digital poster is supported by a study by Apriyani & Sumerti (2015), which showed that students' knowledge prior to education was 100% in the poor category, and increased to 80% good and 20% very good after the poster intervention.

The bivariate test showed a mean score of 63.38 for the pre-test and 81.08 for the post-test, indicating a descriptive difference between the two. The correlation test yielded a significance value (Sig.) of 0.000, which is less than 0.05, indicating a significant relationship between the pre-test and post-test results. Hypothesis testing using both the paired t-test and Wilcoxon test also resulted in a p-value of 0.000. This confirms that the alternative hypothesis is accepted, meaning there is a significant effect of using digital poster media on improving parents' knowledge at SDN Cempaka Putih Timur 03. These findings align with the research by Jumilah et al., (2013), which also demonstrated the effectiveness of poster media in increasing dental health knowledge, with a p-value of 0.0, indicating a significant improvement after the intervention. In conclusion, the univariate test showed a difference between pre-test and post-test scores, where the pre-test score was lower than the post-test. The knowledge score increased, as evidenced by the bivariate test showing a 15.50-point gain. Final results confirmed the effectiveness of digital poster health education, with an Asymp. Sig. (2-tailed) value of 0.000.

CONCLUSION

The implementation of digital posters as an educational medium has successfully increased parents' knowledge regarding dental and oral health maintenance at SDN Cempaka Putih Timur 03, Central Jakarta.

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