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Snowball Throwing Method as an Effort to Improve Dental Health Knowledge in Elementary School Students

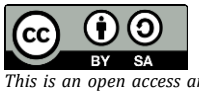
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ABSTRACT

Background: Individual awareness of dental and oral health is essential in preventing dental health problems, therefore dental health education needs to be improved. Good knowledge correlates with greater attention to dental health, making dental health counseling an important step in educating children. The success of counseling can be influenced by the methods and tools used; thus, engaging learning methods such as snowball throwing can enhance students' activeness and interest in learning. This method has been proven effective in educating students to improve dental health. Objective: To analyze the effectiveness dental health knowledge before and after education using the snowball throwing method. Method: This study was conducted using a pre-experimental method with one group pretest posttest design. This study was conducted at SDN Depok 5. The sampling technique used a total sampling of 36 students. Independent variables: education using the snowball throwing method and dependent variables: students' level of knowledge of dental health. The instruments used were questionnaires and questions in snowball throwing. Data analysis was tested using the paired sample t-test. Results: This study showed that the mean knowledge of dental health before education using snowball throwing was 43.70 and after education using snowball throwing was 72.96 with the results of the paired sample t-test obtained a p-value of p <0.000. Conclusion: The snowball throwing method is effective in improving fifth-grade students' knowledge of dental health.

INTRODUCTION

Dental and oral health includes the presence of conditions in which the hard and soft tissues in the oral cavity remain healthy and free from diseases and aesthetic disorders. This kind of situation allows a person to speak, digest food, and interact with others without barrier (Sumadewi & Harkitasari, 2023). Dental and oral health is important because it affects a person's quality of life and productivity (Ramadhan et al., 2016).

Indonesian Health Survey at 2023 indicated that the national prevalence of oral health problems in Indonesia reached 56.9%, with West Java Province reporting a higher rate of 63.4% (Kemenkes RI, 2023). Depok City ranked sixth among cities in West Java with 94,379 reported cases of oral health issues (Dinkes Jawa Barat, 2024). Notably, among children aged 10-14 years, the national proportion experiencing oral health problems was 48.8% (Kemenkes RI, 2023).

Several countries exhibit significant oral health challenges. Research by (Robert et al., 2019) indicated that in Arua, Uganda, 93.2% of school-aged children presented with missing or decayed teeth. Similarly, a study by (Li et al., 2024) reported a high prevalence of dental caries (89.55%) among 8-12-year-old children in Tibet. These findings suggest that oral health problems are not exclusive to Indonesia but are prevalent globally. Consequently, the oral health status in Indonesia and worldwide warrants attention, as childhood caries can potentially lead to oral health complications in adulthood (Octavianita et al., 2024).

Oral health disorders can impede children's growth and development (Theresia et al., 2022). These issues can disrupt daily activities and negatively impact children's nutritional status (Susilawati et al., 2023). Poor nutrition, in turn, contributes to adverse health conditions, as children's oral health influences their overall well-being, competence, skills, and general health status (Fitriani et al., 2023).

Preventing the high prevalence of oral health problems necessitates individual awareness regarding the adoption of healthy lifestyles, including enhanced knowledge through oral health education

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(Aldilawati et al., 2022). An individual's oral health awareness is significantly influenced by their knowledge; greater knowledge correlates with increased attention to oral health (Yuniarly et al., 2023).

According to (Jumriani et al., 2022), enhancing children's oral health knowledge can be achieved through oral health promotion interventions aimed at educating children about the importance of oral health to expand their understanding. Early oral health education can prevent future dental problems and establish long-lasting healthy habits (Meidina et al., 2023).

Research by (Saidah & Isni, 2022) demonstrated an increase in knowledge regarding oral health problems among children following oral health education. This aligns with the findings of which indicated that individuals with good oral health exhibited a knowledge level of 44.7% after receiving health education. Furthermore (Jumriani et al., 2022) reported that education significantly improved knowledge, with the mean knowledge level increasing from 14.5% pre-education to 41.8% post-oral health promotion.

Oral health promotion is a structured and focused effort to establish conditions that encourage individuals or communities to shift from less supportive oral health behaviors to more beneficial ones (Akbar et al., 2020). The success of health promotion can be influenced by the applied method. The delivery of information during health promotion activities should align with the chosen method and is also affected by the availability of supporting tools or media (Utami et al., 2022).

A learning method constitutes a means of conveying learning tools to achieve predetermined objectives. Its function is to determine the success or failure of a teaching-learning process and is an integral component of an educational system (Nasution, 2023).

A learning model encompasses strategies to attain student skills through the application of learning approaches, methods, and techniques. One alternative health promotion method to engage students is the snowball throwing technique (Akkas et al., 2022). Research by (Masria, 2021) evidenced that the use of the snowball throwing method positively influenced student learning outcomes by stimulating student activity, thereby enhancing their interest in learning. Therefore, the snowball throwing learning method can be employed to educate students on efforts to improve oral health.

METHOD

The research design used in this study employs a pra experimental method with a one-group pretest-posttest design. The study was conducted on 5th grade students at SDN Depok 5. The sampling technique used total sampling, involving 36 students.

The instruments used consist of informed consent, questionnaires (pretest and posttest), educational sessions, and the bingo game media. The research was conducted over four weeks with two interventions. In accordance with the theory (Notoatmodjo, 2018) The distance between pretest and posttest is 15-30 days. If the interval is too short, it is possible that the respondent still remembers the questions from the first test. However, if the interval is too long, there may be changes in the variables to be measured.The activities carried out are as follows:

1. The researcher introduced themselves and explained the study procedures to the respondents.
2. Prior to data collection, informed consent forms were distributed to the respondents.
3. During the initial visit, a pre-test questionnaire assessing oral health knowledge was administered to the students. This aimed to evaluate their baseline knowledge before the intervention. Subsequently, participants were divided into three groups, and each group received a set of questions. Following this, the researcher delivered oral health education using the snowball throwing method, conducted in groups for 30 minutes.
4. In the second visit, the same set of questions was utilized and distributed among the three groups. The researcher monitored the implementation of the snowball throwing method for 30 minutes. During this session, respondents engaged in peer-to-peer question-and-answer within their respective groups.
5. In the third visit, a post-test questionnaire was administered to the respondents to assess their knowledge following the oral health education intervention using the snowball throwing method.

The data collected through the respondents' completion of questionnaires was then processed and analyzed. The first step in data analysis is conducting a normality test, followed by a paired sample t-test,.

RESULT

Table 1. Frequency Distribution of Respondent Characteristics by Age and Gender

Characteristics	Frequency	Percent (%)
Age		
10	4	11.1
11	25	69.4
12	6	16.7
13	1	2.8
Total	**36**	**100**
Gender		
Male	23	63.9
Female	13	36.1
Total	36	100

Table 1 indicates a total of 36 respondents. As shown, the majority of respondents were10 years old (11.1%), 11 years old 69.4%), 12 years old (16.7%), and 13 years old (2.8%). Furthermore, the majority of respondents from 5th grade at SDN Depok 5 were male (63.9%), while female respondents comprised 36.1%.

Table 2. Mean Knowledge Levels of Oral Health Before and After Education Using the Snowball Throwing Method

Variabel	$\bar{x}$	Statistics		
		SD	Min	Max
Pretest Knowledge	43.70	14.55	13	80
Posttest Knowledge	72.96	13.42	40	100

Table 2 shows that the mean knowledge variables in the intervention group increased before and after being given education using the snowball throwing method in 5th grade students. The mean student knowledge in the intervention group increased from 43.70 to 72.96.

Table 3. Data Normality Test

Knowledge	$\bar{x} \pm SD$	*p-value*
Pre-test	43.70 ± 14.55	0.305
Post-test	72.96 ± 13.42	0.128

** *Shapiro-Wilk*

Table 3 shows that the data on students' dental health knowledge produced a p-value on the pretest data of 0.305 and a posttest of 0.128. The data was normally distributed because the p-value was p> 0.05, so it was continued with a parametric test.

Table 4. The Effectiveness of Snowball Throwing Method in Improving Knowledge of Oral Health

Knowledge	$\bar{x} \pm SD$	*p-value*
Pre-test	43.70 ± 14.55	0.000
Post-test	72.96 ± 13.42	

* *Paired sample t-test*

Table 4 shows the results of the effectiveness test on the oral health knowledge of 5th grade students at SDN Depok 5, indicate an increase in the mean score from 43.70 in the pre-test to 72.96 in the post-test. This improvement was statistically significant, with a *p*-value of 0.000 ($p < 0.05$). Therefore, these findings suggest that the snowball throwing method is effective in enhancing the oral health knowledge of the students.

DISCUSSION

Knowledge, as defined by (Notoatmodjo, 2022) is the outcome of a knowing process that occurs after an individual perceives a specific object through their senses: sight, hearing, smell, taste, and touch. The knowledge acquired is significantly influenced by the teaching method employed, as appropriate methods can substantially enhance an individual's motivation and learning capabilities (Putriyanti et al., 2022). The application of the snowball throwing method in the learning process has been shown to effectively increase student engagement and learning outcomes through interactive group activities involving the exchange of questions and answers using paper ball media (Wulandari & Attalina, 2023)

This study reports that prior to the *snowball throwing* method intervention, the mean student knowledge score regarding oral health was 43.70. This aligns with findings from (Rinda et al., 2023), who reported a mean score of 16.94 before the snowball throwing intervention. Similarly, (Khoirun Ni'mah et al., 2022) reported a mean student knowledge score of 57.81 regarding oral health. Knowledge is attributed to a lack of understanding among most students regarding optimal tooth brushing timing, proper brushing techniques, and recommended frequencies for dental visits. This is supported by (Susanti et al., 2022), whose research indicated a mean score of 69.92 in knowledge of oral hygiene practices. Research (Pratiwi et al., 2019) reported a mean score of 6.38 for knowledge of tooth brushing methods (Aflah, 2018) emphasized the influence of brushing frequency on oral hygiene, recommending a maximum of three times daily (after breakfast, lunch, and before bedtime) or a minimum of twice daily (after breakfast and before bedtime). Routine dental check-ups every six months, even in the absence of symptoms, are also recommended for consultation and early treatment, and can positively influence children's psychological attitudes towards dentists (Sari et al., 2019).

The limited knowledge among children is compounded by their age range of 10-14 years, which is still categorized as childhood. (Simaremare & Wulandari, 2021) research supports this, noting that children in this age group are in a transitional phase where their ability to acquire and comprehend information is still developing, potentially leading to knowledge deficits if not supported by adequate education.

To enhance the oral health knowledge of 5th grade students at SDN Depok 5, the researcher implemented an intervention involving two sessions of education on oral health using the snowball throwing method. The snowball throwing method is a learning model that utilizes paper-based question balls, modified by placing them inside gacha balls and then thrown sequentially among group members. The purpose of using this method was to capture student attention, prevent boredom during the educational sessions, and make the learning process enjoyable, thereby fostering student interest. In the first phase, the researcher formed three groups, and within each group, education was delivered using the snowball throwing method. The researcher distributed questions that were then randomly thrown to students within the group. The student who received the question paper would read and answer the question. After each student's answer was heard, the researcher would present the next question, and the snowball throwing process would be repeated. If a student could not answer a question, the researcher would provide clarification using appropriate media. The second phase involved evaluation using the snowball throwing method without direct intervention from the researcher. During this phase, students showed enthusiasm in answering questions to win prizes, creating a lively yet manageable atmosphere within each group.

The results of this study demonstrate a significant increase in student knowledge following the education intervention using the snowball throwing method. Among of 5th grade students at SDN Depok 5, the mean knowledge score regarding oral health reached 72.96. This finding indicates a significant difference in the mean knowledge scores before and after the oral health education intervention using the snowball throwing method, resulting in enhanced knowledge of oral health. Research result (Junaidi, 2020), which reported an increase in the mean score to 89.33 after education using the snowball throwing method. Clarified other research (Rinda et al., 2023) found a post-intervention mean score of 19.78 after health promotion using the snowball throwing method. The paired sample t-test results yielded a p-value of 0.000 (p< 0.05), signifying that education using the snowball throwing method effectively improved students' oral health knowledge. Research by (Setiyowati & Fitriyah, 2020) also demonstrated that the snowball throwing method influenced students' tooth brushing behavior, as evidenced by a data analysis p-value of 0.000 (p<0.05). Consistent with (Junaidi, 2020) findings of improved outcomes in the cycles used to enhance students' oral hygiene skills. Thus, it can be concluded that education using the snowball throwing method effectively increases knowledge because the method engages students actively in thinking, thereby enhancing their learning activity. Consistent with (Hidayani, 2020) research affirms that the snowball throwing learning method effectively improves student knowledge by adopting three main approaches: constructivism, inquiry, and questioning. The constructivist approach builds knowledge gradually through

real experiences, enabling students to understand the material more deeply rather than merely memorizing it. Next, inquiry encourages students to actively discover knowledge and skills, while questioning trains students to explore information, confirm understanding, and focus on areas that are not yet understood.

CONCLUSION

Based on the results of the research that has been done, it can be concluded that education using the snowball throwing method is effective in improving elementary school students' knowledge of dental health.

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