Montessori game on toothbrushing knowledge and behaviour in elementary school children

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A R T I C L E   I N F O

A B S T R A C T

Background: One of the places where many bacteria are found is the oral cavity. Influenced by temperature, humidity, and food availability. Knowledge of dental and oral health should be given from an early age because children begin to understand the importance of oral and dental health, which is strongly influenced by knowledge and behavior. Brushing teeth in children with a frequency that is not optimal can be caused because children are not accustomed to brushing teeth early by parents. To be done with fun, learning can be given with montessori games to improve children's knowledge and behavior. Objective: To determine the effect of the montessori brushing game method on increasing knowledge and brushing behavior of grade I students at MI Darul Khoer Wanayasa, Purwakarta Regency. Method: Design using quantitative analytics with one group pre-test and post-test design research design. The type of research used is the Wilcoxon test. Results: Students had knowledge and behavior of brushing teeth with less category 54.6% before the Montessori game method and after the Montessori game method 63.8% of children experienced an increase in knowledge and behavior of brushing teeth with a good category with Asymp.sign (2-tailed) scores of 0.000 < 0.05. Conclusion: There is an influence of Montessori game method on knowledge and behavior of brushing teeth in in elementary school children.

INTRODUCTION

The mouth is one of the places where the growth of bacteria is found, because sufficient temperature, humidity and food are available there. These bacteria have an effect on dental and oral health (Nurilawaty et al., 2021). The cleanliness of the teeth and mouth can be determined by food residue (food scraps), plaque, white material calculus, and stains (stains) on the surface of the teeth. National Basic Health Research (RISKESDAS) in 2018 shows that the biggest dental problem in Indonesia is damaged/caved/sick teeth (45.3%). Oral health problems that most Indonesians experience are swollen gums and ulcers (abscesses) at 14%.

Dental health is part of general health that must be paid attention (Purnama et al., 2020). Dental and oral health education is all activities that can help generate public appreciation for dental health and provide an understanding of how to maintain healthy teeth and mouth. The aim of dental and oral health education is to change the attitudes and behavior of individuals, families, special groups and communities in developing and maintaining healthy living behavior and playing an active role in efforts to achieve optimal health status (Harmita, 2020).

Knowledge is the result of human sensing or the result of a person's knowledge of objects through the senses they have (eyes, nose, ears, and so on). Naturally, at the time of sensing, this knowledge is greatly influenced by the intensity of attention and perception of the object. Most of a person's knowledge is influenced through the sense of hearing (ears) and the sense of sight (eyes) (Notoatmodjo, 2014).

Behavior is what an organism does or what other organisms observe and engage in an action. Health behavior is the actions of individuals, groups and organizations including social change, policy development and implementation, and improving quality of life. Health behavior is a personal attribute such as beliefs, expectations, motives, values, perceptions, and other cognitive elements, personality characteristics, including affective and emotional states and traits, and patterns of behavior, actions, and overt habits related to health maintenance, health restoration, and improved health (Pakpahan dkk, 2018).

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Brushing children's teeth with a frequency that is not optimal can be caused by parents not getting used to brushing their teeth from an early age, so that children do not have the awareness and motivation to maintain the health of their teeth and mouth, this situation makes it easier for children's teeth to be at risk of dental and oral disease (Purnama et al., 2020). As many as 89% of Indonesian children under 12 years suffer from dental and oral diseases, this condition will affect the level of health in the process of growth and development. (Wijayanti & Rahayu, 2018).

The Montessori method encourages children to be able to explore the potential within them to the fullest to achieve the expected educational goals, because children are active learners. When interacting with the environment, children will be active in acquiring knowledge. The Montessori method provides a fun environment for children to construct their own knowledge. In Rousseau, in his romantic flow, he allowed children to learn in a natural and unstructured environment (Rahmadhani & Surbakti, 2022). Sensitive periods are similar to critical periods, genetically they are programmed to block out time so that at certain times the child is most willing and able to master certain tasks. (Zahidi, 2020). The concept of the Montessori approach can be given to children from various backgrounds and various conditions (Metode Montessori Pendidikan Dasar, 2023).

Montessori play tools are characterized by concreteness, can control external and internal errors, isolation of properties and functional integration (Damayanti, 2019). This opinion was added by Lillard (Novianti, 2013) which says that Montessori games, apart from being able to train children's social and cognitive abilities, can also help improve language and mathematics skills. One way is by using the Number Rods game which can improve children's ability to recognize number concepts (Roostin, 2021). This is supported by Eliyawaty (Febrianty & Widayati, 2014) which says that Montessori games are educational games that can improve early childhood development (Mulyati, 2022).

Knowledge and behavior measurement categories according to (Budiman & Riyanto, 2013) can be categorized into 3 levels, namely: knowledge and behavior are said to be good if the respondent is able to answer the statements on the questionnaire correctly by 76% -100% of all statements in the questionnaire, knowledge and behavior are said to be sufficient if the respondent is able to answer the statements on the questionnaire correctly by 56% -75% of all statements in the questionnaire, knowledge and behavior are said to be lacking if the respondent is able to answer the statements in the questionnaire correctly amounting to <56% of all statements in the questionnaire.

Several researchers have proven that the Montessori game learning method can produce results, namely increasing children's knowledge. Nailul Husna in (Husna & Prasko, 2019) shows that dental health education using busy book media can increase dental and oral health knowledge among students at SDN Rowocacing Kab. Pekalongan. Another research was conducted by Nur Afidah and friends in (Afidah, 2022) that the TCR score of 84% in the "very good" category proves that the Islamic Montessori method is very effective in developing children's interpersonal intelligence at Budi Mulia Dua Sedayu Kindergarten.

According to the Purwakarta Central Statistics Agency (*Badan Pusat Statistik Kabupaten Purwakarta*, 2021) Wanayasa sub-district is the second largest sub-district in Purwakarta district and the third sub-district with the highest number of MI in Purwakarta district. (Kementerian Pendidikan dan kebudayaan, 2022). So researchers are interested in examining whether Montessori games influence children's knowledge about good and correct toothbrushes in class I students at MI Darul Khoer.

Based on the results of pre-research conducted on February 16 2023 at MI Darul Khoer Wanayasa, Purwakarta Regency, researchers found that (13 respondents) more than 50% (65.%) of respondents did not know enough about brushing their teeth, while in the sufficient category there were 25 % (5 respondents) and as much as 10% (2 respondents) were included in the good category. From these results it can be concluded that knowledge of toothbrushing at MI Darul Khoer is still very lacking.

METHOD

This type of research uses quantitative analytics with a one group pre-test and post-test design. Because this research studied the effect of the Montessori game of brushing teeth on knowledge and behavior of brushing teeth. The research target using a total sampling technique consisted of 22 students.

The measuring tool used to measure the level of knowledge is a questionnaire consisting of 10 multiple choice questions about brushing teeth, adopted from (Nurlinda, 2020). The measuring tool to measure the level of behavior is a questionnaire consisting of 10 questions about brushing teeth (Nurlinda, 2020). Data analysis used the Mann Whitney test to determine the differences before and after the intervention.

RESULT

The results of research on the influence of the Montessori game of brushing teeth on knowledge and behavior of brushing teeth at MI Darul Khoer Wanayasa, Purwakarta Regency are as follows:

Table 1. The level of toothbrushing knowledge before and after the intervention

Knowledge	Before		After	
	F	**%**	**F**	**%**
Good	0	0	14	63.8
Enough	10	45.4	4	18.1
Less	12	54.6	4	18.1

The table above shows the results of the distribution of research samples on the level of knowledge of class I students before and after being given the Montessori tooth brushing game method. There was an increase in the good category from 0 students (0%), this increased to 14 students (63.8%).

Table 2. The level of toothbrushing behavior before and after the intervention

Knowledge	Before		After	
	F	**%**	**F**	**%**
Good	1	4.6	7	31.8
Enough	7	31.8	13	59.1
Less	14	63.6	2	9.1

The table above shows the results of the distribution of research samples on the level of tooth brushing behavior in grade I children before and after being given the Montessori tooth brushing game method. There was an increase in the enough category from 7 students (31.8%) to 13 students (59.1%).

Table 3. The influence of the Montessori game of brushing teeth on the knowledge of brushing teeth

Times	Average Knowledge Level ($\bar{x}$)
Before	51.3
After	75.9

The table above shows the average comparison level before being given the Montessori toothbrushing game method which was 51.3 and after being given the Montessori toothbrushing game method was 75.9, with a difference of 24.6.

Table 4. The influence of the Montessori game of brushing teeth on the behavior of brushing teeth

Times	Average Behavior Level ($\bar{x}$)
Before	46.3
After	68.1

The table above shows a comparison of the average level of behavior before being given the Montessori game method of brushing teeth, which was 46.3 and after being given the Montessori game method of brushing teeth, it was 68.1, with a difference of 21.8.

Table 5. Data Analysis Using the Wilcoxon Test

Variable	p-value	Description
Tooth brushing knowledge	0.000	There are changes
	Post-test – Pre-test	
Z	-4.084	
Asymp.sig (2-tailed)	.000	

The table above shows the results of data analysis using the SPSS program with the Wicoxon test with a significance value of 0.000. The basis for decision making is the formula if the asymp value. Sig. <0.05, then the hypothesis is accepted, whereas if the value of asymp. Sig. >0.05, then the hypothesis is not accepted. The SPSS test results state that the significance value is 0.000 or <0.05, so it can be concluded that "The Hypothesis is Accepted". This means that there is a difference between the level of knowledge before and after being given the Montessori game method (pre-test and post-test).

Table 6. Data analysis used the Wilcoxon test

Variable	p-value	Description
Tooth brushing Behavior	0.000	There are changes

	Post-test – Pre-test
Z	-3.750
Asymp.sig (2-tailed)	.000

The table above shows the results of data analysis using the SPSS program with the Wicoxon test with a significance value of 0.000. The basis for decision making is the formula if the asymp value. Sig. <0.05, then the hypothesis is accepted, whereas if the value of asymp. Sig. >0.05, then the hypothesis is not accepted. The SPSS test results state that the significance value is 0.000 or <0.05, so it can be concluded that "The Hypothesis is Accepted". This means that there is a difference between the level of behavior before and after being given the Montessori game method (pre-test and post-test).

DISCUSSION

Based on research results, there was an increase in the level of knowledge in class I MI Darul Khoer students before and after being given the Montessori game method of brushing their teeth, there were 14 students in the good category, the good knowledge level category was initially 0 students (0%), it increased significantly to 14 students (63.8%). The enough category was 10 students (45.4%) decreasing to 4 students (18.1%). The less category decreased greatly from 14 students (63.6%) to 2 students (9.1%).

Based on the research results, there was an increase in the level of behavior in class I students before and after being given the Montessori game method of brushing their teeth, there were 7 students (31.8%) in the good category, the good behavior level category was initially 1 student (4.6%) increasing to 7 students (31.8%) %). The enough category from 7 students (31.8%) greatly increased to 13 students (59.1%). Meanwhile, in the less category, it fell very significantly from 14 students (63.6%) to 2 students (9.1). According to (Febrianti, 2023) the Montessori method is a learning method with elements of play (learning while playing), so that students feel motivated, active, and full of enthusiasm in learning. The use of the Montessori method will work well if it is used with play equipment. Having games around makes children comfortable learning without feeling bored with the learning provided. Using this play tool will also help children to stimulate their motor skills.

Research shows results using the Wilcoxon test with a significance value of 0.000<0.05. It can be concluded that there is an influence of the Montessori toothbrushing game method on the level of knowledge of grade 1 students at MI Darul Khoer. The research showed results using the Wilcoxon test with a significance value of 0.000<0.005. It can be concluded that there is an influence of the Montessori toothbrushing game method on the level of toothbrushing behavior of grade 1 students at MI Darul Khoer. The results of this study are in line with research (Aziza, 2020), Ada perbedaan signifikan antara rata-rata hasil belajar anak di kelas eksperimen dengan kelas kontrol, sehingga implementasi metode Montessori memiliki pengaruh signifikan untuk meningkatkan hasil belajar anak untuk materi pola pada kelas eksperimen.

CONCLUSION

Based on the results of the research that has been done, it can be concluded that there is an influence of the Montessori game method on knowledge and behavior of brushing teeth at MI Darul Khoer Wanayasa, Purwakarta Regency.

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