

## Comparison between school and home-based dental health promotion in improving knowledge, parental attitude and dental health of children with mild disabilities

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### ABSTRACT

**Background:** In general, children with physical disabilities have a lower level of oral hygiene compared to able-bodied children because their access to dental health care services is affected by their physical limitations. The level of oral hygiene available to children with disabilities can be improved with the involvement of parents/caregivers equipped with good knowledge and attitudes regarding oral health. **Purpose:** Determine the difference between the effectiveness of school and home visit-based dental health promotion in improving the knowledge and attitudes of parents/caregivers and students regarding oral hygiene as well as lowering the dental plaque scores of students with mild physical disabilities. **Methods:** This study is quasi-experimental and uses the two-group pretest–posttest design. The study's design was created with a model of one observation before intervention ( $O_1$ ), two interventions ( $X_{1-2}$ ) and two observations after intervention ( $O_{2-3}$ ). The study samples are students with mild physical disabilities aged 8–15 years old in special needs school, or sekolah luar biasa (SLB), in Sleman, Yogyakarta, and their parents/caregivers. The locations of the study were SLBs and the respondents' homes. The study instrument was a knowledge test for students with mild physical disabilities and their parents/caregivers, along with a questionnaire on the parents/caregivers' attitudes towards oral and dental health. Plaque control examinations for students with mild physical disabilities were conducted using the O'Leary index. **Results:** School-based oral health promotion was better at improving the attitudes of parents/caregivers to oral hygiene than the home visits ( $p < 0.05$ ). Both school-based and home visit-based oral health promotion was effective in furthering the oral hygiene knowledge of students with mild disabilities and their parents/caregivers as well as in improving the students' dental plaque scores ( $p > 0.05$ ). **Conclusion:** The school based-oral health promotion model was more effective in improving attitudes of the students' parents/caregivers. Both the school-based and the home visit-based oral health promotion models were equally effective in enhancing the knowledge of parents/caregivers, along with the knowledge and dental plaque scores of students with mild disabilities.

**Keywords:** Effectiveness; home visits; mild disability; parents/caregivers; promotion of oral health; school.

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### INTRODUCTION

Children with special needs are one of the human resources whose quality must be improved so that it can participate in future development. The children's quality-of-life improvement needs to be developed and implemented through health programs for children with special needs because their rights to quality services are equal to the rights of other children. According to the mandate of Law No.

23 of 2002 regarding child protection and Law No. 36 of 2009 regarding health, children with special needs require attention and protection from the government, society and their families. Thus, health service needs to be developed to be accessible to children with special needs in accordance with their problems.<sup>1</sup>

'Mild disability' is one type of situation of a child with special needs who suffers from a form of abnormality or disability in the muscular system, bones and joints that may

cause impaired coordination, communication, adaptation, mobilisation and development of personal wholeness.<sup>2</sup> The limbs of children with mild disabilities cannot carry out normal functions. This condition may be caused by a disease or accident, or it can also be congenital by nature and present from birth. Hence, special services are needed in their learning processes.<sup>3</sup> So far, children with mild physical disabilities have not received sufficient attention in terms of dental and oral health. Barriers to dental and oral health services include: the presence/absence of access to dental health services, lack of information about dental and oral health for children with mild physical disabilities and obstacles for skilled dental health professionals. Government support in this area is inadequate, which can be seen in the unavailability of special health facilities for children with mild physical disabilities at public health centres, or *pusat pelayanan kesehatan masyarakat*, and hospitals, the lack of public awareness about the importance of oral health for children with mild physical disabilities and the problem of quite expensive treatment costs.<sup>4</sup>

Children with mild disabilities have lower levels of oral and dental hygiene compared to able-bodied children because they have limited limb function and, thus, limited access to dental health care services. Children with mild physical disabilities require parental/caregiver assistance in maintaining oral and dental hygiene. These children are generally unable to make independent decisions and need to rely on their parents/caregivers to assist and monitor their daily activities. The level of dental and oral hygiene for children with mild disabilities will be better if their parents/caregivers have adequate knowledge, behaviour and attitudes regarding oral health. Parents/caregivers play an important role in promoting these children's dental health and are responsible for teaching them proper and effective hygiene.<sup>5</sup>

The dental health of both the children and parents/caregivers can be improved through a school-based dental health promotion program. The school-based dental health promotion program is a community health service aimed at maintaining and improving the oral health of all students in the target schools, which is supported by individual health efforts in the form of curative efforts for students who need dental and oral health care.<sup>6</sup> Apart from school-based promotion, dental health promotion can be implemented on a home visit basis. Home visit-based dental health promotion programs are health services provided to individuals and families in their homes, with the aim of improving health and maximising the level of independence.<sup>7</sup>

This study provides evidence regarding the differences between school-based and home visit-based dental health promotion for children with mild physical disabilities and their parents/caregivers. It aims to provide them with the best dental health promotion method and can affect their knowledge and the parents/caregivers' attitudes as well as decrease the dental plaque scores of students with mild physical disabilities. The novelties of science in this

study are: identifying the benefit of performing school-based and home visit-based dental health promotion on children with mild disabilities by involving their parents/caregivers in Indonesia (1) and modelling dental health promotion delivered in individual and small groups (3–4 people) by taking into account a comfortable and supportive environment in the learning processes of students with mild physical disabilities (2). The aim of this study is to determine the differences in the effectiveness of school and home visit-based dental health promotion in improving the knowledge and attitudes of the students and their parents/caregivers in this area as well as lowering the students' dental plaque scores.

## MATERIALS AND METHODS

This study is quasi-experimental and uses a two-group pretest–posttest design.<sup>8</sup> The study design consists of one observation before intervention ( $O_1$ ), two interventions ( $X_{1-2}$ ) and two post-intervention observations ( $O_{2-3}$ ).<sup>9</sup>  $O_{1-3}$  were carried out by the students and their parents/caregivers completing the knowledge test and attitude questionnaire and the dental plaques of the students being examined.  $X_{1-2}$  for the students and their parents/caregivers took the form of counselling on oral health and demonstrations of how to brush their teeth properly and correctly.

The study samples were students with mild disabilities aged 8–15 attending the SLB of the Sleman District, Province of Yogyakarta, and their parents/caregivers. Based on the calculation of the sample size formula, ten parents/caregivers and ten students with mild disabilities for group one (school-based) and ten parents/caregivers and ten students with mild disabilities for group two (home visit-based) were obtained. The study location of group one was at the SLB and the location of group two was conducted at the respondent's house.

Purposive sampling was used as the sampling method. The independent variables were school-based and home visit-based dental health promotions. The dependent variables were the knowledge and the dental plaques of students with mild disabilities and the knowledge and attitudes of their parents/caregivers regarding oral hygiene. The inclusion criteria of this study were students with mild disabilities in class D, based on data from the school, and cerebral system disorders. The respondents who attended SLB in Sleman District were cooperative and agreed to an informed consent signed by the students and their parents/caregivers. The parents/caregivers in this study were mothers or caregivers who accompany their children on a daily basis. The students were children in class D, where their intelligence can be developed and they can live together with other able-bodied children. Even though they have disabilities, they do not interfere with their life and education.

Cerebral system disorders, such as cerebral palsy or cerebral disability, are located in the central nervous system

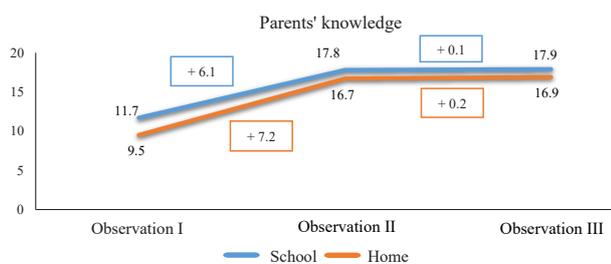
and are characterised by movement, gesture or body shape and coordination disfunction, sometimes accompanied by psychological and sensory disfunction, which is caused by damage or defection during brain development. The exclusion criteria for this study were respondents who had systemic disease and/or paralysis of both hands.<sup>10</sup>

The instrument used in this study was a knowledge test for parents/caregivers about dental and oral diseases and how to maintain oral hygiene. The text consisted of 18 questions, with the highest score being 18 and the lowest 0. The questionnaire on the parents/caregiver’s attitudes focused on their knowledge (cognitive), attitude (affective) and behaviour regarding dental and oral health, with a total of 17 statements. A Likert scale with the highest score of 68 and the lowest score of 17 was used. The knowledge test for the students focused on dental and oral diseases and how to maintain oral hygiene and had a total of 14 questions. The highest score was 14 and the lowest 0. The assessment the students’ plaque control with the O’Leary index used disclosing solutions, the assessment of dental plaque accumulation was performed on all existing teeth and missing teeth were marked with a thick line on the record form. The examination was carried out on four surfaces: the facial, lingual, mesial and distal. If dental plaque was observed on one surface, the score was 1, whereas if there was no dental plaque, the score was 0. The results of the dental plaque assessment were obtained by summing up the dental plaque scores of each tooth surface, so that the dental plaque score for each tooth ranged from 0 to 4. The outcome value was in percentages. Dental plaque of the students was divided into two categories, namely: ≤10% as the good dental plaque score category and >10% as the bad dental plaque score category.

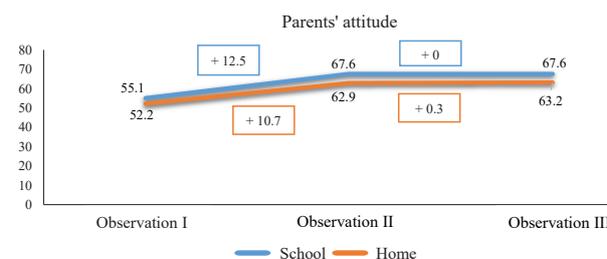
The difference between school-based and home visit-based dental health promotions is that a school-based dental health promotion is health care service provided to the respondents at their school, with the aim to maintain and improve oral health in students at targeted schools that require dental and oral health care,<sup>11</sup> while home visit-based dental health promotion is a health care service provided to individuals and families at their homes, with the aim to improve health and maximise the students’ level of independence.<sup>12</sup> The general linear model repeated measure and a Statistical Package for the Social Sciences (SPSS) version 24 program (IBM, New York, USA) were used for data analysis. All statistical analyses were conducted with a significance of  $p < 0.05$ . Approval of research ethics was obtained from the Faculty of Dentistry, Gadjah Mada University, with the number of 00400/KKEP/FGK-UGM/EC/2020.

### RESULTS

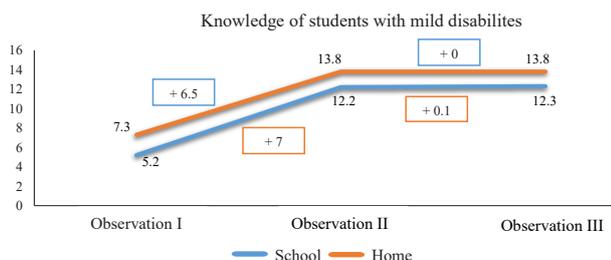
This study was conducted during February–March 2020 and involved 20 students with mild disabilities and 20 parents/caregivers who met the inclusion and exclusion criteria. Figure 1 shows that there was a difference in the mean knowledge of parents/caregivers between school-based and home visit-based promotion in O<sub>1</sub>, O<sub>2</sub> and O<sub>3</sub>. Figure 2 shows that there was a difference in the mean attitude of parents/caregivers after school-based and home visit-based promotions in O<sub>1</sub>, O<sub>2</sub> and O<sub>3</sub>. Figure 3 shows that there was a difference in the mean knowledge of students with mild disabilities after school-based and home visit-based promotion in O<sub>1</sub>, O<sub>2</sub> and O<sub>3</sub>. Figure 4 shows that there was



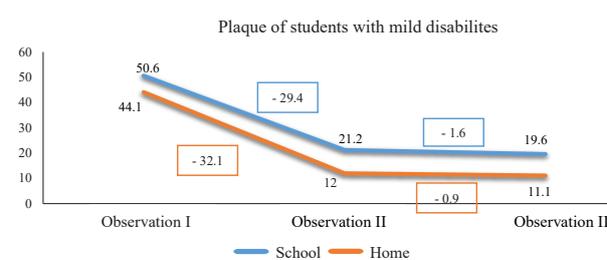
**Figure 1.** Mean knowledge of parents/caregivers in observation I, observation II and observation III.



**Figure 2.** Mean attitude of parents/caregivers in observation I, observation II and observation III.



**Figure 3.** Mean knowledge of students with mild disabilities in observation I, observation II and observation III.



**Figure 4.** Mean dental plaque score of students with mild disabilities in observation I, observation II and observation III.

a difference in the mean plaque scores of students with mild disabilities between school-based and home visit-based promotions in O<sub>1</sub>, O<sub>2</sub> and O<sub>3</sub>.

Table 1 shows that there was no difference in the knowledge of parents/caregivers in the school-based and home visit-based groups in O<sub>2</sub>–O<sub>2</sub> ( $\Delta 1$ ) and O<sub>3</sub>–O<sub>2</sub> ( $\Delta 2$ ) with a value of  $p = 0.11$ . There was a difference in the attitudes of parents/caregivers in the school-based and home visit-based groups in  $\Delta 1$  and  $\Delta 2$  with a value of  $p = 0.01$ . Therefore, it can be said that school-based and home visit-based dental health promotion were both equally effective in improving the knowledge of parents/caregivers about oral hygiene and school-based dental health promotion was more effective in improving the attitudes of parents/

caregivers regarding oral hygiene than home visit-based promotion.

Table 2 shows the improvement of the parents/caregivers' knowledge regarding oral hygiene in  $\Delta 1$  in the school-based and home visit-based groups, with a value of  $p = 0.04$  and an improvement in the parents/caregivers' attitudes in  $\Delta 1$  in the school-based and home visit-based groups, with a value of  $p = 0.02$ . Therefore, it can be said that there was a statistically significant improvement in the knowledge and attitudes of parents/caregivers regarding oral health in  $\Delta 1$ . There were improvements of the parents/caregivers' knowledge regarding oral health in the school-based and home visit-based groups in  $\Delta 2$ , with a value of  $p = 0.66$  and in the attitudes of parents/caregivers in the school-

**Table 1.** Differences in knowledge and attitudes of parents/caregivers between school-based and home-based oral health promotion

Variable	Observation	Group	Mean	SD	Sig.
Knowledge	$\Delta 1$ (O <sub>2</sub> – O <sub>1</sub> )	School	6.10	1.28	0.11
		Home	7.20	0.92	
	$\Delta 2$ (O <sub>3</sub> – O <sub>2</sub> )	School	0.10	0.57	
		Home	0.20	0.422	
Attitude	$\Delta 1$ (O <sub>2</sub> – O <sub>1</sub> )	School	12.50	1.50	0.01
		Home	10.70	1.83	
	$\Delta 2$ (O <sub>3</sub> – O <sub>2</sub> )	School	0.10	0.00	
		Home	0.30	0.48	

**Table 2.** Improvements in knowledge and attitudes of parents/caregivers of school-based and home visit-based from observation I, observation II and observation III

Variable	Observation	Group	Mean	SD	Sig.
Knowledge	$\Delta 1$ (O <sub>2</sub> – O <sub>1</sub> )	School	6.10	1.28	0.04
		Home	7.20	0.92	
	$\Delta 2$ (O <sub>3</sub> – O <sub>2</sub> )	School	0.10	0.57	0.66
		Home	0.20	0.422	
Attitude	$\Delta 1$ (O <sub>2</sub> – O <sub>1</sub> )	School	12.50	1.50	0.02
		Home	10.70	1.83	
	$\Delta 2$ (O <sub>3</sub> – O <sub>2</sub> )	School	0.10	0.00	0.06
		Home	0.30	0.48	

**Table 3.** Differences in knowledge and dental plaques of students with mild physical disabilities in school-based and home-based oral health promotion

Variable	Observation	Group	Mean	SD	Sig.
Knowledge	$\Delta 1$ (O <sub>2</sub> – O <sub>1</sub> )	School	7.00	1.24	0.49
		Home	6.50	1.08	
	$\Delta 2$ (O <sub>3</sub> – O <sub>2</sub> )	School	0.10	0.31	
		Home	0.10	0.47	
Dental Plaque	$\Delta 1$ (O <sub>2</sub> – O <sub>1</sub> )	School	-29.37	19.00	0.39
		Home	-32.07	11.90	
	$\Delta 2$ (O <sub>3</sub> – O <sub>2</sub> )	School	-5.66	14.29	
		Home	-0.94	2.33	

**Table 4.** Improvements in knowledge and the decrease of dental plaque scores of students with mild physical disabilities after school-based and home visit-based interventions in observation I, observation II and observation III

Variable	Observation	Group	Mean	SD	Sig.
Knowledge	$\Delta 1$ (O <sub>2</sub> – O <sub>1</sub> )	School	7.00	1.24	0.35
		Home	6.50	1.08	
	$\Delta 2$ (O <sub>3</sub> – O <sub>2</sub> )	School	0.10	0.31	0.58
		Home	0.10	0.47	
Dental Plaque	$\Delta 1$ (O <sub>2</sub> – O <sub>1</sub> )	School	-29.37	19.00	0.70
		Home	-32.07	11.90	
	$\Delta 2$ (O <sub>3</sub> – O <sub>2</sub> )	School	-5.66	14.29	0.31
		Home	-0.94	2.33	

based and home visit-based groups in  $\Delta 2$ , with a value of  $p = 0.06$ . Thus, it can be said that there was no statistically significant improvement in the knowledge and attitudes of parents/caregivers regarding oral health in  $\Delta 2$ .

Table 3 shows that there was no difference in the knowledge of students with mild physical disabilities in the school-based and home visit-based groups in  $\Delta 1$  and  $\Delta 2$ , with a value of  $p = 0.49$ . There was no difference in the dental plaque scores of students with mild physical disabilities in the school-based and home visit-based groups in  $\Delta 1$  and  $\Delta 2$ , with a value of  $p = 0.39$ . Therefore that it can be said that school-based and home visit-based dental health promotions were equally effective in improving knowledge and lowering dental plaque scores for students with mild physical disabilities.

Table 4 shows the improvement in knowledge of students with mild physical disabilities in the school-based and home visit-based groups in  $\Delta 1$ , with a value of  $p = 0.35$ , and  $\Delta 2$ , with a value of  $p = 0.58$ . There was a decrease in dental plaque scores for students with mild physical disabilities in the school-based and home visit-based groups in  $\Delta 1$ , with a value of  $p = 0.70$ , and  $\Delta 2$ , with a value of  $p = 0.31$ . Hence, it can be said that there was no statistically significant difference in knowledge improvement and the decrease of dental plaque scores of students with mild physical disabilities in  $\Delta 1$  and  $\Delta 2$ .

## DISCUSSION

This study generally finds that after the end of the intervention, there was no statistically significant difference between the school-based and home visit-based dental health promotion groups in terms of improving parental knowledge of dental and oral health. It concludes that school-based and home visit-based dental health promotion were equally effective in improving the knowledge of parents/caregivers regarding dental and oral health.

School-based and home visit-based dental health promotion were equally effective in improving knowledge of parents/caregivers regarding dental and oral health because the counselling sessions at school and at home were both relaxed and comfortable and the parent/caregivers were able to focus and not be distracted by other things. Counselling activities at school and at home also facilitated discussions with questions and answers, allowing a direct approach to parents in order to solve cases or problems related to dental and oral health and provide opportunities and flexibility for respondents to help them in accordance with what was needed. Counselling activities at school and at home were equally flexible according to the agreement of the counsellor and counselee regarding both the location and time of counselling.

These results are in line with a study conducted by Imazu et al., which compared individual and group-based educational interventions to monitoring service

providers for patients with type 2 diabetes mellitus. The results obtained from both individual and group-based interventions were equally effective in improving the patients' knowledge about type 2 diabetes mellitus. The success of this study was based on several advantages. The individuals with type 2 diabetes were equally monitored and the intervention process was carried out deeply, providing optimal development services according to the problems needed. Individual-based and group-based interventions allow dialogue, reflection, exchange of experiences and knowledge as well as shared responsibility for the patients' own health.<sup>13</sup>

This study finds that generally after the end of the intervention, there was a statistically significant difference between the school-based and home visit-based dental health promotion groups in regard to the improvement of their parents/caregivers' attitudes towards oral health, with the school-based group significantly better than the home visit-based group. It concludes that school-based dental health promotion was more effective than home visit-based promotion in terms of improving the parents/caregivers' attitudes towards oral health.

School-based dental health promotion was more effective in improving attitudes of parents/caregivers towards oral and dental health because counselling activities in schools were more formal and the parents/caregivers who attended counselling activities could focused more clearly and not be distracted by other activities. Respondents were able and active in following the course of counselling, such as asking questions, listening and issuing their ideas/insights and being able to respect the opinions of others. School-based counselling programs facilitate discussions, questions and answers between respondents. Every question and answer can be listened to together. With such variations, the parents/caregivers' knowledge can be further improved. The activeness of respondents in counselling activities can be seen in their activeness in group discussion activities.

This result was in line with the study conducted by Tugeman et al. about the effect of dental and oral health education programs in schools on improving caregiver attitudes. The results obtained were that dental and oral health education programs in schools are effective in improving caregiver attitudes. The success of this study was due to several advantages, namely the good response rate of parents/caregivers of deaf students during the study process, almost everyone participating in the study and the intervention being conducted by a professional dental health provider, which affected the results of the scores obtained by the parents/caregivers of deaf students.<sup>14</sup>

This study has generally obtained the results that after the end of the intervention, there was no statistically significant difference between the school-based and home visit-based dental health promotion groups in improving knowledge and decreasing dental plaque scores of students with mild physical disabilities. The conclusion is that school-based and home visit-based dental health promotion are equally effective in improving knowledge

and lowering dental plaque scores of students with mild physical disabilities.

School-based and home visit-based dental health promotion are both effective in improving knowledge and lowering dental plaque scores of students with mild physical disabilities because both counselling events at school and at home have the effect of a comfortable and supportive environment in the students' learning processes, stimulating more enthusiasm in the learning processes. This is because at school they can interact with friends, while at home the parents/caregivers are present to accompany the counselling activities, so students with mild disabilities can focus more on listening to counselling, helping them understand what was being said. Both counselling activities at school and at home can improve knowledge and reduce dental plaque scores for students with mild physical disabilities because every explanation and all attention given by researchers can focus on students with mild physical disabilities.

These results were in line with the study conducted by Suliono et al. on the effectiveness of the implementation of group counselling services and individual counselling services as an effort to overcome student delinquency problems. The results obtained from both group counselling services and individual counselling services were equally effective in an effort to overcome student delinquency problems. The success in this study was due to several advantages, such as students feeling that they were equally cared for, the counselling process being carried out more deeply and to the point of problems faced by students. The teacher acted as a companion to the students in an effort to provide them with optimal development services in accordance with the problems faced by students, by not excluding the principles and functions of counselling guidance.<sup>15</sup> In conclusion, school-based oral health promotion is better at improving attitudes of parents/caregivers towards oral health than home visit-based programs. School and home visit-based oral health promotion are both effective in improving knowledge of the students and their parents/caregivers and lowering the student's dental plaque scores.

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