

Research Report

Plaque index between blind and deaf children after dental health education

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ABSTRACT

Background: Difficulty in mobility and motor coordination could affect the health at teeth and mouth. Dental health education of the blind and deaf children differs according their limitation. Blind and deaf children need a particular guidance in dental health education to promote oral hygiene as normal children do. **Purpose:** The objective of this study was to observe the difference of plaque index between blind and deaf children before and after dental health education. **Methods:** This research used purposive sampling technique. Twenty-three blind children were taken as samples from SLB-A Negeri Bandung and 31 deaf children from SLB-B Cicendo Bandung. The data were then collected through plaque index examination using modified patient hygiene performance (PHP) test. **Results:** The result descriptively showed that plaque index average value of 23 blind children before dental health education was 3.0725 and after, was 1.7970. On the other hand, the plaque index average of deaf children before dental health education was 2.7474 and after was 1.5. **Conclusion:** It is concluded that plaque index of deaf children is better than blind children before and after dental health education.

Key words: Plaque index, blind children, deaf children, dental health education

ABSTRAK

Latar belakang: Kesulitan dalam pergerakan dan koordinasi motorik akan memengaruhi kesehatan gigi dan mulut. Pendidikan kesehatan gigi dan mulut anak buta dan tuli akan berbeda tergantung tingkat kekurangan mereka. Anak tunanetra dan anak tunarungu membutuhkan pendidikan khusus berupa pendidikan kesehatan gigi untuk meningkatkan kebersihan gigi dan mulut serupa dengan anak normal. **Tujuan:** Untuk mengetahui perbedaan indeks plak antara anak-anak buta dan tuli sebelum dan sesudah pendidikan kesehatan gigi. **Metode:** Penelitian ini menggunakan teknik purposive sampling. Dua puluh tiga anak tunanetra diambil sebagai sampel dari SLB-A Negeri Bandung dan 31 anak tunarungu dari SLB-B Cicendo Bandung. Data tersebut kemudian dikumpulkan melalui pemeriksaan indeks plak menggunakan indeks patient hygiene performance (PHP) modifikasi. **Hasil:** Hasil penelitian secara deskriptif menunjukkan bahwa nilai indeks plak rata-rata 23 anak tunanetra sebelum pendidikan kesehatan gigi adalah 3,0725 dan sesudah pendidikan kesehatan gigi adalah 1,7970. Sedangkan, indeks plak rata-rata anak tunarungu sebelum pendidikan kesehatan gigi adalah 2,7474 dan sesudah pendidikan kesehatan gigi adalah 1,5. **Kesimpulan:** Indeks plak anak tunarungu lebih baik dibandingkan dengan anak tunanetra sebelum dan sesudah pendidikan kesehatan gigi.

Kata kunci: Indeks plak, anak tunanetra, anak tunarungu, pendidikan kesehatan gigi

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INTRODUCTION

The disabled form a substantial section of the community. It is estimated that there are about 500 million people with disabilities worldwide. Prevalence of disabled people vary from country to country, the variance in prevalence may be attributed to ascertainment basis, the standardization methods employed from study to study.¹

Number of persons with disabilities in Indonesia in 2005 reached 6.7 million people (3.11% of the total population). Blind population numbered was 309.146 (4.6%), deaf population was 192.207 (2.8%), mental retarded was 178.870 (2.6%), and 94.423 persons with another disability. Indonesia is the second country in the world that has the greatest amount of visual impairment. This amount could increase because of earthquakes, disasters, accidents, and so forth.

Knowledge is the main factor in shaping a person's behavior and occurs after a person does a sense of particular object. Sensing occurs through human senses i.e. seeing, hearing, smelling, tasting, and touching. However, most of the knowledge is acquired through our eyes and ears.² Blind and deaf children are considered as people with specific needs due to physical and mental impairment that limit their daily activities such as walking, seeing, listening, speaking, working, and studying.³

Difficulty in mobility and motor coordination could affect the health of teeth and mouth.⁴ Therefore, the blind and deaf children need special dental health education and guidance to improve their ability as normal children do. Dental health education of the blind and deaf children differs according to their limitations. Dental health education of blind children can be done by recording oral hygiene instructions using tape recordings, performing tooth brushing demonstration with big tooth model. Dental health education of deaf children was done by pantomime and demonstration.

Although individuals who are disabled are entitled to the same standards of health and care as the general population, there is evidence that they experience poorer general and oral health. The oral health of the disabled may be neglected because of the disability condition, a demanding disease or limited access to oral health care. Moreover, because of their level of function and their limited ability to undergo an oral examination, the disabled persons present specific challenges when their oral health is assessed. However, with appropriate planning, clear communication and careful limitations to the service provided, the dramatic dental neglect experienced by the majority of these individuals can be successfully alleviated.²

Their oral health care needs are compounded by their disorders, medications and lack of oral hygiene at home. Gingival hyperplasia, periodontal disease, and caries are prevalent. Eighty percent of the children are residential and rely on dorm personnel, teachers and must be helped

for oral hygiene care.⁵ Plaque control is important in oral health program because dental plaque is the main cause of dental caries and periodontal disease.⁶ Maintaining healthy teeth and mouth should be done since the age of primary school because it was the right time to train a child's motor skills including brushing teeth.⁷

In this study, the plaque index between deaf and blind children were compared before and after dental health education. The one who can receive more information should be able to repeat what has been taught in dental health education even with their limited capabilities.

MATERIALS AND METHODS

The research was a descriptive study and using purposive sampling method. Samples were taken from 23 blind children in SLB-A Negeri Bandung and 31 deaf children in SLB-B Cicendo Bandung with the criteria as follows: ages from 6–12 years old, with total sensory impairment, and still active attending their school activities.

The procedure was begun by filling the questionnaire about dental hygiene habits accompanied by each guardian and examiner. The plaque index was examined by putting disclosing solution at the tip of the tongue then spreading out to the entire surface of the teeth. The result was written on the examination sheet. Then, the children were taught about dental health education based on their capabilities followed by conducting a joint tooth brushing.

Dental health education for children with visual impairment can be done by recording the oral hygiene instruction using a cassette tape, do show the correct way to brush teeth by using big teeth model. Deaf children given dental health education by using a special method such as pantomime and demonstration performing.⁶

Plaque index examination was done after dental health education and the result was written once again on the examination sheet. Modified PHP test was used to examine plaque index on six surfaces of teeth (facial surface 11, 31, 16, and 26 and lingual surface 36 and 46) with criteria, if there was no plaque on tooth surface, the value was 0, but if there is a plaque on tooth surface, the value was 1. Plaque index of each person was calculated by total value of all the subdivisions of dental plaque divided number of teeth examined.⁸ Independent t test was used in this study.

$$t = \frac{\bar{B}}{S_b / \sqrt{n}}$$

B = average of plaque index

S_b = standard deviation

√n = number of children

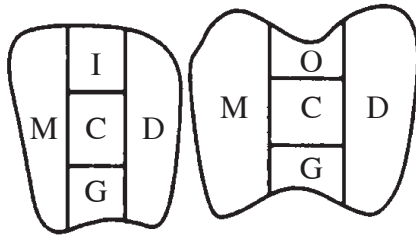


Figure 1. Five subdivision of dental surfaces in Plaque Index PHP.⁸
Note: M = mesial; D = distal; I = incisal; O = occlusal;
C = central; G = gingival

RESULTS

Data was obtained from 23 blind children from SLB-A Negeri Bandung and 31 deaf children from SLB-B Cicendo Bandung. Plaque index average values between blind and deaf children can be seen at table 1. Modified PHP index was used to measure the plaque index.

Plaque index of the blind children from SLB-A Negeri Bandung before dental health education was 3.07 and after was 1.79, both were included in average category. Plaque index of the deaf children from SLB-B Cicendo Bandung before dental health education was 2.75 (average) and after, was 1.5 (good).

That plaque index of deaf children was lower than blind children, it could be said that deaf children's oral hygiene was better than blind children which was caused by various factors (Figure 2).

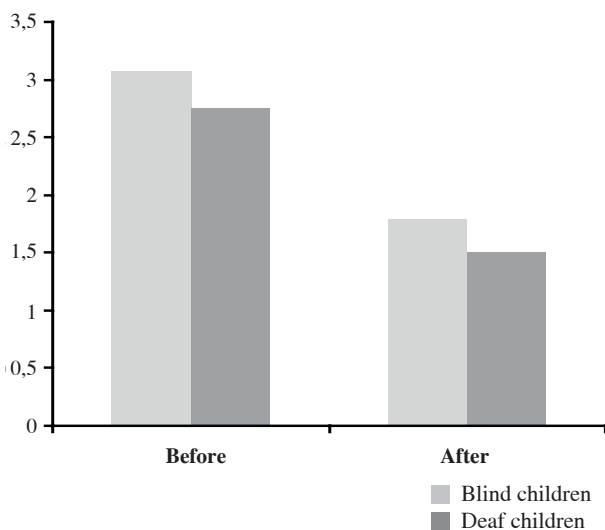


Figure 2. Plaque index of blind children and deaf children.

DISCUSSION

The result showed that there were differences of plaque index between blind children and deaf children before and after the dental health education. Plaque index of blind children before dental health education was 3.07 and after,

was 1.79. On the other hand, the plaque index of the deaf children before dental health education was 2.75 and after, was 1.5. According to these data, the plaque index of deaf children was better than the blind children. This was due to different information delivery, daily habits such as tooth brushing, eating sweet and sticky foods as well as social and family factors, and the last but not the least, the appreciation of dental health education. Changes in sugar consumption, preventive dental treatment and improvements in oral hygiene care are other possible reasons for the reduction of plaque accumulation.⁹

Information delivery of the blind children and the deaf children were different because of their limitations. Based on the research conducted by Brydon Lamb, people learn 83% through seeing, 11% through hearing, 3.5% through smelling, 1.5% through touching, and 1% through the tasting.¹⁰ Deaf children use their vision, which is the main line in receiving information and blind children use their hearing and feeling senses in receiving information. General sense of hearing and sense of tasting in the blind child is more sensitive than deaf children. Both senses are working to replace the function of sight as the primary senses.

Habitual factor also plays an important role in plaque formation. Parents play a vital role in filtering the interaction between children and their environment through the feeding habits, oral hygiene care, and other preventive practices and services they make available to their children. Predisposing, enabling, and reinforcing factors affect parents' ability to install healthy oral habits into a child's daily routine.¹¹

Research conducted in India showed that the education of the mother was the single best predictor for oral hygiene status and explained 92% of the variance. These findings show that children with hearing and visual impairment have poor oral hygiene and high levels of periodontal disease. This may be due to a lack of communication; hence, appropriate oral health education should be tailored to the needs of these students with the support of their teachers and their parents.¹³

Tooth brushing and other mechanical measures are the most practical and effective means of achieving and maintaining adequate oral hygiene. Although tooth brushing is a simple and effective means of removing plaque, the high prevalence of periodontal disease in the general population indicates that tooth brushing performance is inadequate.¹⁰ From the results of the questionnaire conducted showed that the habit of blind and deaf children have similarities and also differences.

This is evident from the following survey. Habit of brushing teeth every day on blind children as many as 21 people (91.30%) and who never brush their teeth as much as 2 people (8.70%) while on blind children as many as 29 people (93.55%), brushing teeth every day and 2 people (6.45%) never brush their teeth. A total of 19 children with visual impairment (66.67%) and 20 children with hearing impairment (68.97%), brush their teeth twice a day at breakfast and before sleeping at night. According to Carranza¹² and Manson and Eley (1993), frequency of

brushing is correct twice a day e.g. at breakfast and before bed time.

Difference in way of tooth brushing in blind children and deaf children can be seen from the auxiliary brushing equipment. A total of 16 blind children (76.19%) never use the auxiliary equipment and 18 deaf children (58.06%) use auxiliary equipment like toothpicks (40%).

In this study, blind children have never used the auxiliary equipment whereas deaf children use the auxiliary equipment such as toothpick. Brushing teeth by using auxiliary equipment such as dental floss, toothpicks are an effective way to remove dental plaque.¹² This difference shows that deaf children have a higher awareness of oral hygiene compared with the blinds.

Candy and chocolate are examples of sweet foods that can damage the tooth surface. High sugar content in sweet food provides good environment to bacteria in the oral cavity. Most blind children and deaf children like sweet foods. This can be seen from the percentage of blind children and deaf children who like sweet foods. After eating foods sweet blind children and deaf children more often drink water than rinsing and brushing teeth.

According to survey, a total of 14 blind children (60.87%) never get a dental health education while 20 deaf children (64.52%) get a dental health education. Therefore, deaf children more understand and know how to keep and maintain oral hygiene.

Decrease in plaque index of blind children was higher than deaf children. This was caused by more sensitivity in the sense of taste and sense of hearing compared to the blind children so that their function can replace the primary senses of sight. However, in this study differences in plaque index were not significant because the frequency of dental health education was only done once.

Plaque index of blind children before and after dental health education was in the average category. This could occur because the blind children still did not fully understand how to brush their teeth in the correct way and also dental health education was not given effectively. On the other

hand, plaque index of the deaf children before dental health education was in average category and after was in a good category. This could happen because the particular deaf children have already had dental health education before so that they were more understanding, in maintaining oral hygiene. Deaf children can receive information better due to the normal function of sight. It is concluded that plaque index of deaf children was better than blind children before and after dental health education.

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