

Effectiveness of Personal Instruction for Students with Gingivitis under Observation from a Yogo Teacher at a Special Needs School

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The purpose of this study was to clarify the effectiveness of personal instruction for students with gingivitis under observation (GO) from a Yogo teacher at a special needs school. The subjects were 6 students of the 7th to 9th grade at a special needs school in Gunma Prefecture, Japan whose social ages were 6.0 to 7.1 years. To provide a sense of achievement to such subjects, the Yogo teacher placed an emphasis on performing activities with subjects and making positive comments about the results achieved. The instructional program at the school was composed of 2-day instructional blocks given once per week over a period of 3 weeks. The gingival conditions and the living activities of the subjects, such as clean and healthy activities, and tooth brushing activities, produced improvement in all subjects after the instructional program. PMA indices became significantly lower for all subjects. The number of items related to tooth brushing increased for all subjects. Parent awareness of brushing as a step toward self-reliant behavior also increased. These results show that the personal instruction for students with GO from the Yogo teacher at a special needs school was effective in students with social age of 6.0 years and more.

Keywords: special needs school, Yogo teacher (school nurse similarity), school dental health, gingivitis under observation (GO), personal coaching

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1. Introduction

Due to a partial revision of the School Health Law in December, 1994, new guidelines for dental-oral examinations were formulated. Assessment for “gingivitis under observation” (GO) (Tsuge, 2009) during school physical examinations was started in July, 1995 (Akasaka, 1998). According to the Ministry of Education, Culture, Sports, Science and Technology (MEXT), GO is defined as follows: “a gingival condition that shows plaque buildup and mild gingivitis without calculus, which can be ameliorated by improvements in living habits and careful tooth brushing” (Sports and Youth Bureau, School Health Education Division, MEXT, 2006).

It has been 14 years since the initiation of GO assessment. While it has been reported that gingivitis in children at some elementary schools was improved through group dental-care instruction (Okada et al., 1991; Miki, 2001), the number of children with periodontal disease has increased [Ministry of Health, Labour and Welfare (MHLW), 2005]. Apparently, dental health training has not yet proven to be effective in Japanese schools.

Since dental/oral health conditions and living behavior/habits vary with individual children, it is necessary to instruct children individually in consideration of their respective developmental stages in order to provide effective periodontal disease prevention training at school. Provision

of such individualized training as an educational activity requires special knowledge and skill related to dental health. Yogo teachers with such knowledge and skill, therefore, can play an important role in this area (Jinta et al., 1999). Such Yogo teachers are in a position to coordinate school oral health education with specialized local medical institutions and school dentists (Iwasaki, 2009 a). By making the most of Yogo teachers, it is hoped that more effective training for dental care can be provided to children.

Some schools and classes are dedicated to education for children with intellectual disabilities. From the viewpoint of developing self-care ability, it is extremely important to guide children in such special-needs schools/classes to pay due attention to their own dental/oral health and to develop their ability to brush their own teeth for the maintenance of oral hygiene (Iwasaki, 2008; Iwasaki et al., 2008).

According to School Dental/Oral Health for Better Living (Yasui, 2006; MEXT, 2005), “In life-long personal health care, one has to advance from the stage of ‘dependent health management,’ where one’s own health is dependent on and managed by others, such as parents, to the stage of ‘autonomous health management’ based on individual judgment, will, and behavioral choices as one becomes older (MEXT 2005).”

While this idea should be valued in education at special-needs schools/classes as well, it is difficult for such children to transition from the stage of dependent health management to the stage of autonomous health management using the same methods used for normal children (In this paper, autonomous health management is referred to as self-reliant behavior). For enhancement of self-reliant behavior, it is considered to be essential that Yogo teachers, who have specialized knowledge in school healthcare, take the initiative in the provision of training on oral care to individual children in cooperation with parents and in consideration of the nature of the individual student’s disability. However, there have been no studies published on the educational effects of personal training for oral care for children with GO in special-needs schools/classes.

In this study, therefore, the effectiveness of personal training for such children from a Yogo teacher was investigated with a focus on changes in subject behavior and health recognition.

2. Methodology

2.1. Subjects

Nine (47.4%) of the 19 students enrolled in a junior high school for intellectually disabled children were assessed as GO. Out of these 9 students, 6 students, whose social ages were assessed as 6 years or older (6.0 to 7.1) by the new version of the social maturity test (Miki, 1980), were selected as the subjects of this study.

2.2. Study Method

This study was conducted as an intervention study with no control groups.

2.2.1. Personal Training

In oral health education, it is important to lead learners to a sense of achievement at various stages in the process of attaining their individual goals (Iwasaki, 2009 b). In this study, therefore, the Yogo teacher was directed to (1) participate in the relevant activities with each subject; and (2) let the subjects know specifically how far they had progressed in the achievement of their goals.

At school, a six-session personal training program was provided to the individual subjects over a period of 3 weeks. Each session consisted of a 2-day procedure including the following six steps: (1) Check of gum condition: Using a “Gum Condition Check Sheet” (**Figure 1**) (hereinafter referred to as check sheet), the Yogo teacher taught the subject the difference between healthy and swollen gums. (2) Plaque staining: The Yogo teacher applied “2-Tone” disclosing stain (Young Dental, USA), which stains older plaque blue and new plaque red, to the subject’s teeth. (3) Oral photograph: Using a cheek retractor (a medical instrument used to hold cheek membrane), the Yogo teacher took a photograph of the subject’s dental plaque. (4) Instruction on tooth brushing in cooperation with the subject’s homeroom teacher: The subject practiced brushing the plaque stained red or blue from his/her gums while checking in a mirror. The homeroom teacher assisted the Yogo teacher by giving encouraging comments to the subject. For example, when a subject succeeded in removing the stained plaque from his/her gums, the Yogo teacher praised him/her by explaining clearly why the stain had disappeared with comments such as “The red

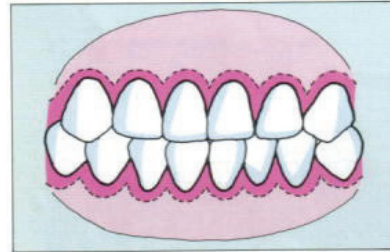
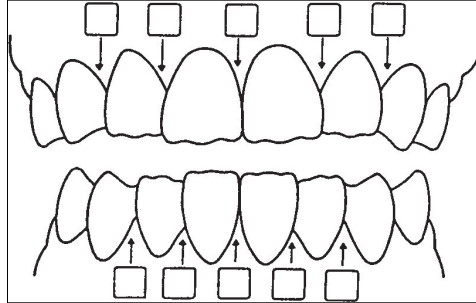
Check Sheet for Gum Condition

Date

1. Let's press your gums with a cotton swab.

Let's mark the condition on the diagram. If the gum is healthy, mark it with ○.

If the gum is swollen, the mark is √.



2. Photograph taken after the plaque staining.

Paste the photograph.

Healthy gum



Swollen gum



Comments from the homeroom teacher

Comments from parents

Comments from the Yogo teacher

Figure 1 Check Sheet for Gum Condition

stain disappeared because you used the toothbrush correctly by switching hands.” Then, the homeroom teacher reinforced the comment with agreement such as, “That’s right. You used your toothbrush correctly. Now your gums look beautiful.” (5) Explanation of gingival condition using visual aids (Day 2): The Yogo teacher attached the oral photograph taken on the previous day to the check sheet and asked the subject to compare the photographed gum condition with the areas on a diagram of gums on the check

sheet that they had marked the previous day. (6) Advice to parents based on the check sheet: The Yogo teacher and homeroom teacher wrote comments on the check sheet to let parents know what dental-care training had been provided at school. After reading the comments, parents responded on the check sheet and returned it to their child’s homeroom teacher.

At home, with help of parents, each subject checked the condition of his/her gums by pressing them mildly with a cotton swab in front of a mirror



Check Sheet for Gum Condition at Home

Date

1. Let's press your gums with a cotton swab.

Let's mark the condition on the diagram. If the gum is healthy, mark it with

○. If the gum is swollen, the mark is √.

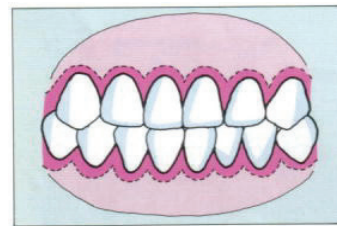
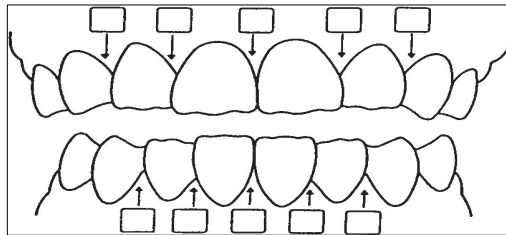


	Healthy gums	Swollen gums
Color	Light pink	Red
Shape	Triangular	Roundish, swollen.
Touch sensation	Elastic, firm	Swollen soft
Pressed by a cotton swab	No bleeding	Easily bleed

2. Let's mark the condition on the diagram. If the gum is healthy, mark it with

○. If the gum is swollen, the mark is √.

Gum area



3. Let's write your findings during observation with the family.

Comments from the homeroom teacher

Comments from the Yogo teacher

Figure 2 Check Sheet for Gum Condition at Home

and recorded the results on the Home Gum Condition Check Sheet (hereinafter referred to as Home Check Sheet) (See **Figure 2**) by marking the relevant places on the gum diagram printed on the sheet with a circle indicating “healthy” or a checkmark indicating “swollen”. Parents made comments on the check sheet based on their observations and submitted it to the school. The Yogo teacher and homeroom teacher

wrote their responses and returned the sheet to the parents.

2.2.2. Assessment Method

Before and after the provision of personal training, assessment was performed based on a survey of gingival condition and living habits as well as a check sheet for target items including PMA indices

Table 1 Questionnaire on Gingival Condition and Living Habits

Gingival condition	1. What color are your gums? (1) Dusky red (reddish) (2) Partially reddish (3) Mostly light pink
	2. What shape are your gums? (1) Mostly roundish (2) Partially roundish (3) Evenly triangula
	3. Are your gums swollen? (1) Mostly swollen (2) Partially swollen (3) Mostly tight without swelling
	4. What are your gums like when you press them with a cotton swab? (1) Mostly inelastic and soft (2) Partially inelastic and soft (3) Firm and elastic
Hygienic/healthy living habits	5. Do you pay attention to your oral condition includingteeth and gums? (1) Seldom (2) Sometimes (3) Always
	6. Do you go to dentist for check-ups? (1) I seldom go to the dentist even if my teacher tells me to go. (2) I go to the dentist when my teacher tells me to. (3) I receive periodic dental check-up whether or not I have any dental problems.
	7. Do you gargle and wash your hands before meals and after returning home? (1) Seldom (2) Sometimes (3) Always
	8. Do you take a handkerchief and tissues to school with you? (1) Seldom (2) Sometimes (3) Always
	9. Do you keep lifestyle? (1) No (2) Sometimes (3) Always
	10. What time do you go to bed? (1) No earlier than 11:00 PM (2) At around 10:00 to 11:00 PM (3) No later than 10:00 PM
	11. Do you feel frustrated or depressed? (1) Often (2) Sometimes (3) Seldom
	12. Do you take a toothbrush to school with you? (1) No (2) Sometimes (3) Always
	13. Do you brush your teeth after meals? (1) Seldom (2) Often (3) Always
	14. Do you brush your teeth while checking in the mirror? (1) Seldom (2) Sometimes (3) Always
Tooth brushing	15. Do you use dental floss as a part of tooth brushing? (1) Seldom (2) Sometimes (3) Often
	16. Do you brush your teeth before going to bed? (1) Seldom (2) Sometimes I forget doing so (3) I do no matter how tired I am.
	17. Do you have a snack at about the same time each day? (1) No (2) Mostly (3) Always
Dietary habits	18. Do you have sweet snacks? (1) Often (2) Sometimes (3) Seldom
	19. Are you picky about what you eat? (1) Very picky (2) A little picky (3) Not at all
	20. Do you have breakfast? (1) Seldom (2) Sometimes (3) Every day

and tooth brushing activities. In addition, comments from parents written on check sheets and assessment sheets, and behavioral changes in the subjects were also examined.

The survey of gingival condition and living habits was carried out using the questionnaire published in “Survey of Gingival Condition and Living Habits” (Japanese Society of School Health, 2004) (See **Table 1**). In the questionnaire, respondents selected the most suitable response from the 3 choices presented. The choices for each survey item were numbered from 1 to 3, with higher numbers indicating a healthier gum condition. The results of observation by each subject with the Yogo teacher were recorded for “4 factors of gingival condition”. Parents answered “7 factors of hygienic/healthy

living habits,” “5 factors of tooth brushing,” and “4 factors of dietary habits”. The “Before personal training” assessment was performed on the day before intervention, and the “After personal training” assessment was performed 3 weeks after intervention.

PMA index assessment was performed by a dentist based on the oral photographs taken by the Yogo teacher 6 times per subject. Oral photographs were taken so that the results of photograph-based assessment would coincide with those of visual assessment (7.1 mega-pixel digital camera manufactured by Doctor’s Eye with a 72 mm ring light, flash-off, in macro mode). The same dentist performed all photograph-based assessments of PMA indices for the respective subjects. PMA index was devised by Schour et al in 1947. Any inflammation

detected in the papillary area, marginal area, or attached gingival is assigned a score of 1 point. If no inflammation is detected, a score of 0 points is assigned. The total score is regarded as PMA index. The maximum score is 34 points and the minimum is 0 points.

SPSS16 was used for statistical processing. Friedman test was performed to compare gingival conditions before and after personal training. The level of statistical significance was set at 5%. The start day of personal training (September 5) was regarded as “before personal training” and the final day of personal training (September 27) was regarded as “after personal training.”

Tooth brushing activities were assessed by parents, homeroom teachers, and the Yogo teacher. From the viewpoint of reliability and validity, the items assessed as “attained” by parents, homeroom teacher, and the Yogo teacher were regarded as goals which the subject had attained. The start day of personal training was regarded as “before personal training” and the final day of personal training was regarded as “after personal training.”

Parent comments presented on check sheets and assessment sheets were extracted. The start day of personal training (September 5) was regarded as “before personal training” and the comments presented one week after the start date or later were regarded as comments given “after personal training.”

2.3. Ethical Considerations in the Study

This study was performed in accordance with the Ethical Guidelines for Epidemiological Research issued by the MHLW. After explanation of the study outline, oral and written consent for participation and cooperation was obtained from all subjects and their parents. Prior to obtaining consent, subjects and their parents were informed that participation was on a purely voluntary basis, that they would have no disadvantage even if they were to withhold consent, and that they were free to withdraw their consent after submitting the consent form. All data were anonymized. Consent for publishing research findings was also gained from all subjects and their parents.

Table 2 Results of the Questionnaire on Gingival Condition and Living Habits

		A		B		C		D		E		F	
B : Before training, A : After training		B	A	B	A	B	A	B	A	B	A	B	A
Gingival condition	1 Color of gums	2	3	2	3	2	3	2	3	2	3	2	3
	2 Shape of gums	2	3	2	3	2	3	2	3	2	3	2	3
	3 Swelling	2	3	2	3	2	3	2	3	2	3	2	3
	4 Elasticity	2	3	2	3	2	3	2	3	2	3	2	3
Hygienic/healthy living habits	5 Oral check	2	3	1	2	2	3	1	3	2	3	3	3
	6 Periodic dental check-up	1	2	2	3	3	3	3	3	2	2	1	2
	7 Gargling/hand washing	2	3	2	3	3	3	2	3	3	3	3	3
	8 Handkerchief	2	3	2	3	2	3	2	2	3	3	1	3
	9 Ordered lifestyle	2	3	2	3	3	3	3	3	3	3	2	3
	10 Bedtime	1	3	2	3	2	3	3	3	3	3	2	2
Tooth brushing	11 Mental condition	1	2	1	3	3	2	2	3	2	3	3	3
	12 Toothbrush	3	3	3	3	3	3	3	3	3	3	3	3
	13 Tooth brushing after meals	3	3	2	3	3	3	3	3	3	3	3	3
	14 Tooth brushing using a mirror	1	3	1	3	2	3	1	3	2	3	1	3
	15 Use of dental floss	1	1	1	1	1	1	3	3	1	1	1	3
	16 Tooth brushing before bedtime	1	3	1	3	3	3	2	3	3	3	3	3
Dietary habits	17 Regular snack time	1	2	1	3	3	3	2	2	3	3	3	3
	18 Sweet snacks	1	2	1	3	3	3	2	2	3	3	3	3
	19 Picky eating	2	3	3	3	2	3	3	3	3	3	1	3
	20 Skipping breakfast	2	3	2	3	3	3	3	3	3	3	2	3

3. Results

3.1. Questionnaire on Gingival Condition and Living Habits

Questionnaire results (See Table 1) are summarized in Table 2.

Regarding gingival condition after personal training, all 6 subjects indicated gingival improvement in response to the following survey items: (1) color, (2) shape, (3) swelling, and (4) elasticity.

Regarding hygienic/healthy living habits after personal training, all 6 subjects indicated improvement in response to the following survey items: (7) gargling and hand washing and (9) ordered lifestyle. In terms of (6) periodic dental check-up, no changes were observed in 3 subjects including 2 subjects who recorded the highest score of 3, while the remaining 3 subjects indicated improvement. Regarding the other items, improvement was seen in all subjects, though with individual differences in degree of improvement.

Regarding tooth brushing activities after personal training, all 6 subjects indicated improvement in response to the following items: (13) tooth brushing after meals, (14) tooth brushing using a mirror, and (16) tooth brushing before bedtime. In terms of (15) use of dental floss, only 1 subject indicated improvement, showing little change as a whole.

Regarding dietary habits, some subjects indicated “picky eating” and “skipping breakfast,” respectively, in response to questions (19) and (20) before personal training. After personal training, however, all subjects indicated “no picky eating” and “no skipping of breakfast,” respectively, in response to questions (19) and (20).

3.2. PMA Index

Table 3 shows PMA indices for the respective subjects. The values decreased in all subjects, though with individual differences noted, demonstrating gingival improvement. When compared, PMA indices after personal training were significantly lower than those before the training.

3.3. Assessment of Tooth Brushing Activities

Table 4 shows the results tooth brushing activity assessment after personal training. Parents,

Table 3 PMA Indices

Date	A	B	C	D	E	F
9/5 (Wed)	9	8	3	9	5	3
9/7 (Fri)	8	8	3	9	4	3
9/12 (Wed)	7	5	3	8	5	3
9/18 (Tue)	8	7	4	7	4	2
9/20 (Thu)	6	5	2	5	2	2
9/27 (Thu)	5	2	1	2	1	0

*: p < 0.05

*

homeroom teachers, and the Yogo teacher agreed on the assessment for all items except one. The items which all the subjects achieved before personal training were as follows: (1) holding the toothbrush, (2) inserting the toothbrush into the mouth, (5) plaque staining, and (6) inserting the cheek retractor into the mouth. The items which all the subjects achieved after personal training were as follows: (8) holding the cheek retractor during oral photographing, (9) tooth brushing using a mirror, (12) brushing teeth with the bristles of the toothbrush, (13) brushing the gum-line, (14) brushing while paying attention to gum condition, (15) brushing using a method suitable for one’s dental condition, (16) brushing willingly, (19) removing more plaque (stained areas) by brushing, (20) healthier gingival condition, and (21) increase in family attention to tooth brushing.

3.4. Comments from Parents

The comments from parents written on check sheets and assessment sheets are summarized in Table 5. Before implementation of personal training, parents had apparently given up on improving the gingival conditions of their children, as is evident in the following comments: “I thought my child had reddish gums because of some disease,” and “I had never thought my child would be able to change the angle of the toothbrush correctly when brushing.” After personal training, however, parent comments indicated positive assessment of the children’s performance and an increased aware of the importance of tooth brushing as a step toward self-reliant living. This is demonstrated in the following comments: “We, parents, also began to pay more attention to effective tooth brushing” and “We brush teeth together and check the effectiveness of each other’s brushing.”

Table 4 Assessment of Tooth Brushing Activities after Personal Training

		A		B		C		D		E		F	
B : Before training, A : After training		B	A	B	A	B	A	B	A	B	A	B	A
1	Holding the toothbrush	○	○	○	○	○	○	○	○	○	○	○	○
2	Inserting the toothbrush into the mouth	○	○	○	○	○	○	○	○	○	○	○	○
3	Tooth brushing after being told	○	○	○	○	○	○	○	○	○	○		○
4	Voluntary tooth brushing	○	○	○	○	○	○	○	○	○	○		○
5	Plaque staining	○	○	○	○	○	○	○	○	○	○	○	○
6	Inserting the cheek retractor into the mouth	○	○	○	○	○	○	○	○	○	○	○	○
7	Somebody else holding a cheek retractor during oral photographing	○	○	○	○	○	○	○	○	○	○		○
8	Holding the cheek retractor during oral photographing	○		○		○		○		○		○	
9	Tooth brushing using in a mirror	○		○		○		○		○		○	
10	Oral check using a mirror	○				○		○		○			○
11	Switching hands while tooth brushing	○				○		○					○
12	Brushing teeth with the bristles of the toothbrush	○		○		○		○		○		○	
13	Brushing the gum-line	○		○		○		○		○		○	
14	Brushing while paying attention to gum condition	○		○		○		○		○		○	
15	Brushing using a method suitable for one's dental condition	○		○		○		○		○		○	
16	Brushing willingly	○		○		○		○		○		○	
17	Talking about teeth and gums			○						○			○
18	Spending more time on tooth brushing	○		○		○		○		○		○	
19	Removing more plaque (stained areas) by brushing	○		○		○		○		○		○	
20	Healthier gingival condition	○		○		○		○		○		○	
21	Increase in family attention to tooth brushing	○		○		○		○		○		○	

Table 5 Comments from Parents

- My child began to brush voluntarily in front of the mirror.
- I thought my child had reddish gums because of some disease. I had never imagined they could be such healthy pink.
- My child came to enjoy brushing teeth in front of a mirror.
- My child showed me how I should switch hands while brushing teeth. I had never thought he would be capable of doing such a thing.
- My child now has pink and tight gums and white teeth. He looks happy while brushing.
- My child used to refuse to be checked for plaque when brushing. Thanks to the training at school, he has come to like it and is willing to brush.
- We brush teeth together and check the effectiveness of each other's brushing. Now my child can use a toothbrush more effectively.
- My child now pays attention to his gum condition when brushing teeth.
- Thanks to the training at school, my child began to check his teeth in the mirror after brushing. He looks satisfied with the outcome of each brushing.
- We, parents, also began to pay more attention to effective tooth brushing.

3.5. Changes in Subject and Parent Awareness

Using check sheets and explaining in simple and clear language, the Yogo teacher repeatedly showed subjects the differences between healthy and swollen gums. As a result, the subjects developed the ability to immediately indicate the correct photograph when asked to identify which one represented swollen gums. Seeing the Yogo teacher circle the areas, which had been assessed as swollen based on PMA indices, in the dental photographs she had taken, they developed the ability to correctly mark their check sheets and check sheets at home.

Repeated praise by the Yogo teacher and homeroom teachers motivated subject desire to brush, as is evidenced by such comments as “I want to brush more” and “I will brush my teeth again tomorrow.” When subjects realized that the area stained red on their gums indicated swelling, they started brushing more carefully, trying to change the angle of the bristles or holding the brush with the other hand.

Subject parents were repeatedly advised via check sheets. Eventually, positive comments began to appear on the check sheets, indicating satisfaction in their children’s progress.

4. Discussion

4.1. Improvement of Gingival Condition and Living Habits Indicated by Assessment Results

After the Yogo teacher provided personal training, improvement was observed in the subjects in terms of gingival condition, hygienic/healthy living habits, and dietary habits. Color, shape, swelling, and elasticity improved in all subjects. These results were consistent with the results of assessment based on PMA indices.

Parents, homeroom teachers, and the Yogo teacher agreed on assessments of subject tooth brushing in the majority of cases. All subjects developed the ability to check their individual brushing results in a mirror and brush before going to bed, indicating that tooth brushing had become a lifestyle habit. The lowest social age among the subjects was 6.0 years. Considering that individuals at the social age of 6.0 years or older have high social ability and self-reliant behaviors (Miki, 1980), it is assumed to be possible for students at this social age to make tooth brushing a habit. Inaba et al. (1999) and Michiwaki et al. (1999) have reported that intellectually disabled individuals

need to be at a minimum level of 7 or 8 years to recognize the importance of hygienic activities such as tooth brushing. In this study, however, it was demonstrated that individuals at the social age of 6.0 years or older were capable of engaging in hygienic activities on a habitual basis. Gingivitis caused by plaque developing on the teeth is said to be improved by tooth brushing (Yasui et al., 2001; Yasui, 2006). This study showed that swollen gums in students with intellectual disability could also be ameliorated when they acquired the habit of regular tooth brushing.

4.2. Reduction in PMA Index using Oral Photographs

To ensure unity of assessment, the same evaluator assessed all PMA indices. Assessment was conducted by comparing oral photographs taken before and after personal training in such a way that the results of photo-based assessment would be the same as those of visual assessment. Chronological assessment of PMA indices was carried out by comparing the oral photographs taken before personal training with those taken after the training. The Yogo teacher circled the areas in the oral photographs she had taken on the previous day that had been assessed as swollen based on PMA indices. Through this activity, subjects developed the ability to check the condition of their own gingiva. Yoshida et al. (2007) reported that a combination of oral photographs, PMA indices, and GO assessment served as effective data for brushing instruction for normal junior high school children. The same results were achieved in this study in students with intellectual disability.

The use of visual aids in education for individuals with intellectual disability has been attempted at some schools. In the study in children with intellectual disability, Katou et al. (2005) reported that tooth brushing instruction using visual aids such as photographs and picture cards was effective when implemented in consideration of the subjects’ respective intellectual developmental stages. Kobata et al. (2006) reported that use of picture cards as visual aids enhanced the effectiveness of tooth brushing training for intellectually disabled individuals. In this study, too, photograph-based visual comparison between healthy gums and subjects’ own swollen gums resulted in more careful tooth brushing and reduced PMA indices. Thus, the effectiveness of repetitious training using visual aids

was demonstrated.

4.3. Effect of the Training Method Suggested from Assessment of Tooth Brushing Activities

Having dysfunction and disability, intellectually disabled people are said to have reduced awareness and understanding of the importance of dental health and to have difficulty in learning the need to brush teeth (Obokata, 1990). Meanwhile, it has also been reported that tooth brushing ability varies with the individual and that promotion of appropriate dental management and dental health activities can increase the effect of training and decrease incidence of dental disease (Kawano et al., 1993).

After personal training, behavioral changes were observed in the subjects, as shown in the increase in the number of items relating to tooth brushing which had been achieved. Using oral photographs, mirrors, a plaque staining agent, and check sheets, the Yogo teacher provided personal training tailored to the individual development stage of the subjects. As a result, subjects were aware of the goals they were expected to achieve. Since the Yogo teacher praised subjects for each item achieved, they gained apparent confidence in their ability, and willingly participated in activities to improve the condition of their gingiva. In other words, the Yogo teacher succeeded in motivating subjects to move on to subsequent targets by participating in relevant activities with them and making them aware of their own achievements through personal training.

4.4. Changes in Parent Comments

According to comments from parents, they had apparently given up on improving the condition of their children's gingiva before implementation of personal training. After the training, however, they evaluated their children's performance positively and became aware of the importance of tooth brushing as a step to self-reliant living.

Parent cooperation is essential for the maintenance of children's health (Kagami et al., 2008; Nakazima et al., 2008; Mori, 2009). This is especially true in cases where children have intellectual disability with impairment in understanding, behavioral function, and practical skills (Mouri et al., 2001; Nose, 2007; Takahata et al., 1998). Since parents were informed of each achievement made by their child by means of

check sheet and were requested to record whatever they found about the child on the home check sheet in this study, they were led to appreciate each stage of their child's progress and enjoy involvement in these health promotion activities with the child. School staff and parents acknowledged and praised the children's efforts and reported them to each other. This seemed to stimulate subject motivation to aim for subsequent targets.

4.5. Effectiveness of Personal Training from the Yogo teacher

Provision of personal training to school children assessed as GO in educational activities requires special knowledge and skills in dental health. Yogo teachers with such knowledge and skills, therefore, can play an important role in this area. According to the results of a survey we performed in 2007 (Iwasaki et al., 2008), however, only 20.8% of Yogo teachers engaged in personal dental/oral care training for school children.

The subjects of this study, students in a special-needs school, developed the ability to check swelling in their own gums after receiving personal training in which the Yogo teacher repeatedly explained, orally and with visual aids, differences between healthy and swollen gums using a mirror and photographs of GO. The Yogo teacher praised subjects for each of their new findings and achievements. This motivated them to move on to subsequent activities, saying "I want to do more," or "I will do it again tomorrow." Observing such behavioral changes, parents/Yogo teacher/homeroom teachers evaluated the subjects with comments such as "The child looks happy about brushing," and "All family members also began to pay more attention to tooth brushing." GO can be self-checked using a mirror (Yasui, 2006; Tsuge, 2009). Individuals assessed as GO can receive one-to-one personal training while checking their gingival condition in a mirror. Considering these facts and the fact that the gingival condition in all subjects was improved during this study, personal instruction mainly from a Yogo teacher can be considered effective for the amelioration of GO in students at the social age of 6.0 years or older.

Due to the ethical issues involved in withholding training from some students while making it available to others, this study was performed without control groups (i.e., groups given no training). Comments

from parents and child behaviors are believed to be influenced by the social/educational background of the parents. Because of the small size of the subject population, however, we were unable to take this factor into account in this study. This limited a full investigation of the subjects in this study.

5. Conclusion

Six junior high school students with intellectual disability (social age of 6.0 to 7.1 years by the new version of social maturity test), assessed as GO were instructed on tooth brushing from a Yogo teacher on a one-to-one basis to improve their gingival condition. The effect of such personal training on the gingivitis in the students was investigated in this study.

The results of the investigation were as follows:

- 1) The results of the questionnaire on gingival condition and living habits demonstrated that gingival condition in all the subjects improved after receiving personal training.
- 2) PMA indices in all subjects became significantly lower after personal training.
- 3) In terms of tooth brushing activities, the number of the items which the subjects achieved was increased.
- 4) According to parent comments, they also came to pay more attention to their children's tooth brushing as a step to self-reliant living.

These results demonstrated that the personal training provided by the Yogo teacher was effective for improvement of oral health in students with intellectual disability at the social age of 6.0 years or older.

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Appendix Defining a Yogo teacher

Yogo teachers have same duties in a school as school nurses. However, A Yogo teacher is not a nurse but a special licensed educator who supports children's growth and development through health education and health services. She/he promotes the principles of health in all areas of educational activities in schools. (Definition by Japanese Association of Yogo Teacher's Education, 2003).



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Membership in Learned Societies:

- Japanese Association of School Health
- Japanese Association of Yogo Teacher Education
- Japanese Association of Health Consultation Activity
- The Japanese Association of Safety Education
- The Japan Association for School Mental Health