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A comparative study on the effects of providing customized versus conventional oral hygiene instructions to visually impaired adults

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**A comparative study on the effects of providing
customized versus conventional oral hygiene
instructions to visually impaired adults**

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Group 4.4

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1. ABSTRACT

Aim: The aim of this study was to compare the effectiveness of providing conventional (audio/video recorded) OHI and that of providing customized OHI to visually impaired adults in Hong Kong in improving their oral hygiene and gingival health status.

Methods: A randomized clinical trial was conducted on visually impaired adults in two of the social and training centres of the Hong Kong Society for the Blind after obtaining ethical approval. At baseline, the study subjects were interviewed and clinically examined by calibrated examiners using a LED intra-oral light, disposable mirrors, and periodontal probes. The oral hygiene and gingival health status of index teeth were recorded using the Visible Plaque Index (VPI) and the Gingival Bleeding Index (GBI), respectively. They were then randomly allocated into the conventional OHI or the customized OHI group. Instructions on toothbrushing and interdental cleaning were provided. A clinical examination was conducted 2 weeks later to evaluate the change in the subjects' oral hygiene and gingival health status.

Results: A total of 42 subjects were recruited at baseline and 38 (20 in the conventional and 18 in the customized OHI groups) were examined in the evaluation. The mean VPI score of the subjects in the conventional OHI group reduced from 0.238 at the baseline to 0.120 at the evaluation examination (paired t-test, $p=0.001$). The mean VPI score of the subjects in the customized OHI group reduced from 0.249 at the baseline to 0.107 at the evaluation examination (paired t-test, $p<0.001$). The amount of reduction in the mean VPI score between the two OHI groups, 0.114 and 0.118, is not statistically significant (two-sample t-test, $p>0.05$). Similar magnitudes of reduction in GBI scores were also found in the two OHI groups (0.060 vs. 0.058; two-sample t-test, $p>0.05$).

Conclusions: Provision of conventional OHI to the visually impaired adults in Hong Kong can improve their oral hygiene and gingival health status. Provision of customized OHI can also improve their oral hygiene and gingival health status. There are no significant differences between the short-term effectiveness of providing the above two types of OHI to the visually impaired adults.

2. INTRODUCTION

According to the International Statistical Classification of Diseases, Injuries and Causes of Death, visual impairment includes low vision and blindness. Blindness is defined as having “visual acuity less than 3/60m or corresponding visual field loss in the better eye with the best possible correction”.¹ Low vision is “visual acuity of less than 6/18, but equal to or better than 3/60m, or a corresponding visual field loss to less than 20 degrees in the better eye with best possible correction”.

In Hong Kong, people with visual impairment account for 1.8% of the population.² Therefore, dentists working in Hong Kong have a considerable chance of encountering patients with visual impairments in the daily practice. However, little is known about their oral health behaviours and condition.

Oral hygiene is closely related to oral health, especially gingival health.³ Maintaining a high standard of oral hygiene can lower the incidence and slow down the progression of oral diseases such as tooth decay, gingivitis and periodontitis. For dentists, giving instructions on oral hygiene has long been a primary dental care service item for patients. There is evidence that giving oral hygiene instruction (OHI) is effective in improving people's knowledge of the oral environment and may subsequently bring about enhancement in people's oral health.⁴

Conventionally, blind people receive oral hygiene instruction through listening to audio recording. However, they may have difficulties in fully understanding the messages as there are no visual aids or tactile aids. As a result, carrying out proper oral hygiene procedures may pose a challenge to them.⁵ Furthermore, people with visual impairment may face difficulties in recognizing oral diseases as they cannot see the signs of the diseases.

Some dentists have provided oral hygiene instructions that target at individual patient's oral hygiene condition, especially in the case of the visually impaired. Provision of individualized oral hygiene instruction has been shown to be more effective than giving written instructions in treating gingivitis.⁶ Similarly, there are studies showing that with the use of good verbal instructions and tactile aids, children with visual impairments can achieve the same level of oral hygiene as normal children.⁷ As these studies were mainly carried out

among children, there is limited clinical evidence on the efficacy of providing customized oral hygiene instructions in visually impaired adults.

Noting the above situation, we decided to conduct a pilot study to investigate the effects of providing different types of oral hygiene instructions to visually impaired adults in Hong Kong in improving their oral hygiene and gingival health status.

3. AIM AND OBJECTIVES

The main aim of this study was to compare the effectiveness of providing conventional and customized oral hygiene instructions to visually impaired adults improving their oral hygiene and gingival health status.

The objectives of this study were:

- 1) to describe the effectiveness of providing conventional (audio/video recorded) oral hygiene instruction (OHI) to visually impaired adults in improving their oral hygiene and gingival health status;
- 2) to describe the effectiveness of providing customized OHI to visually impaired adults in improving their oral hygiene and gingival health status; and
- 3) to compare the effectiveness of the above two types of OHI provision methods.

In relation to the above three objectives, there were three corresponding null hypotheses to be tested. These were:

- 1) provision of conventional OHI to visually impaired adults had no effect on changing their oral hygiene and gingival health status ;
- 2) provision of customized OHI to visually impaired adults had no effect on changing their oral hygiene and gingival health status ; and
- 3) there was no difference between the effects of providing the above two types of OHI to visually impaired adults on changing their oral hygiene and gingival health status.

4. MATERIALS AND METHODS

4.1. Study population and recruitment

In this study, the target study population was Hong Kong adults aged between 20 to 60 years who had visual impairment. The severity of visual impairment of the study subjects could range from low vision to complete blindness. They should have basic self-care ability and no other major disabilities. People with life-threatening diseases or medical problems were also excluded.

Several non-profit making organizations serving the visually impaired population in Hong Kong were contacted. A positive reply was received from the Ebenezer School and Home for the Visually Impaired. However, it was decided that the school was not appropriate for this study because most of its members were children. Finally, the Hong Kong Society for the Blind (HKSB) was selected as the collaborating organization in this study because their members were mostly adults.

The HKSB is a non-governmental organization subvented by the Hong Kong government. In this study, the HKSB took up the role of recruiting and contacting participants and providing venue for the events. Initially, staff of the HKSB anticipated that they could recruit around 100 of its members to participate in this study. Recruitment of the participants was done through a telephone hotline service which was the most extensively used promotional method of the HKSB. Two HKSB centres, one located in Shek Kip Mei and one in Tuen Mun, were involved.

4.2. Study design and activities

This study was a randomized clinical trial using a parallel group design. Ethical approval from the Institutional Review Board (IRB) of the University of Hong Kong was obtained prior to the implementation of this study (Appendix 1). Information about this study was provided and informed consent was obtained from each participant (Appendix 2).

The first part of the study field work was a pre-study visit to the first HKSB centre. The aim of this visit was to collect information from a small group of visually impaired adults regarding their oral hygiene status, oral health knowledge, and difficulties in performing proper oral hygiene practices. The collected information was used for identifying any particular problems the target group commonly encountered, and for designing the appropriate instructions on oral hygiene practices. During this visit, there was an interview using a structured questionnaire and a clinical examination. After the clinical examination, an oral health education talk on wisdom teeth, denture care, dental trauma, and recurrent aphthous ulcer was provided.

The study proper consisted of two visits to each of the two HKSB centres. In the first visit, baseline information about the subjects was collected by conducting an interview using a structured questionnaire that was pilot tested in the pre-study visit, and a clinical examination. Aim of the baseline examination was to record the oral hygiene and gingival health status of the subjects before the provision of OHI.

After the baseline examination, the subjects were put into two categories - having relatively good or poor oral hygiene. In each category, the first person was randomly allocated to receive conventional or customized OHI and the second person was then allocated to the other OHI group. The random allocation of subjects to the two study OHI groups was repeated for the third and fourth subjects in the same oral hygiene category, and so on.

In the first visit, oral hygiene instruction was provided to the participants according to their study group assignment. A toothbrush and a tube of fluoridated toothpaste were given to each study participant as souvenirs.

The second visit was arranged 2 weeks after the first visit. In this visit, an evaluation clinical examination was conducted on the study participants to assess their oral hygiene and gingival health status. Oral hygiene reinforcement, scaling and application of fluoride varnish were provided to the study subjects after the examination. An outline of the study activities is shown in Table 1.

Table 1. Time schedule of the study activities.

Date	Activities
December, 2011	Contact potential collaborating organizations
Mid January, 2012	Discussion with the HKSB Confirmation of the details of the study
Late January, 2012	Site visit to HKSB centres Promotion and recruitment of participants in Centre 1
3 February, 2012	Pre-study visit
23 February, 2012	Baseline examination in Centre 1
8 March, 2012	Evaluation examination in Centre 1
March, 2012	Promotion and recruitment of participants in Centre 2
2 April, 2012	Baseline examination in Centre 2
16 April, 2012	Evaluation examination in Centre 2

4.3. Data collection method and tools

4.3.1. Questionnaire

Face-to-face interviews using a structured questionnaire (Appendix 3) were held in the pre-study visit and in the baseline visit. The questionnaire consisted of 4 parts, A to D. Details of the questionnaire were as follows:

- 1) Part A consisted of 5 questions on the subject's medical history. The questions were on the subject's degree of visual impairment, age when visual impairment started, and current medication.
- 2) Part B consisted of 4 questions on the subject's oral hygiene habits. The questions were on the subject's frequency and duration of toothbrushing, characteristics of the subject's oral hygiene tools, tools for interdental cleaning, and toothbrushing technique.
- 3) Part C consisted of 2 questions on the difficulties experienced by the subject while performing oral hygiene practices. The questions were on the features of a toothbrush that helped cleaning of teeth and on the sites in the subject's mouth that were difficult to clean.

- 4) Part D consisted of 6 questions on the subject's dental health knowledge. The questions were on the ideal frequency of dental check-ups, frequency and duration of toothbrushing, oral hygiene tools' ideal properties, and consequences of having bad oral hygiene.

Participants in the pre-study visit answered the full set of questions while the study subjects interviewed in the baseline visit were only required to answer Parts A and B of the questionnaire. The interviews were conducted by dental students and examples of oral hygiene tools were used as tactile guides.

4.3.2. Clinical examination

In the clinical examination, Visual Plaque Index (VPI) and Gingival Bleeding Index (GBI) were used to record the oral hygiene and the gingival health status of the subjects, respectively.⁷ A specially designed record form (Appendix 4) was used. The data for VPI was obtained by careful visual inspection with the aid of a disposable mouth mirror attached to an intra-oral LED light. Sites with visible plaque were recorded as '1' (positive) while sites without plaque were recorded as '0' (negative). The VPI score was calculated as the proportion of tooth sites examined that harboured visible plaque.

In assessing the gingival health of the subjects, a CPI (Community Periodontal Index) probe was run along the gingival margin and the presence or absence of bleeding from the gingivae was recorded. Sites with gingival bleeding were recorded as '1' (positive) while sites without bleeding were recorded as '0' (negative). The GBI score was calculated as the proportion of gingival sites examined that showed bleeding.

In the clinical examination, 10 index teeth were chosen for examination. These were a central incisor, the first premolars and the first molars in each jaw. The adjacent tooth of the same type was used if an index tooth was missing. Four sites per tooth were examined, namely the mesial buccal, mid-buccal, distal buccal, and mid-lingual/palatal sites.

The examination was carried out by the same two calibrated examiners and two recorders throughout the study. Calibration of the examiners was performed in the Prince

Philip Dental Hospital prior to the visits to the HKSB centres. Duplicate examinations were conducted on a 10% sample of the study subjects in all the visits to monitor inter-examiner reliability.

4.4. Oral Hygiene Instruction (OHI)

4.4.1. Conventional OHI

The conventional OHI provided in this study included tooth brushing method, use of interdental brush, flossing with a floss holder, and denture cleaning. It was provided by playing videos and soundtracks used for educating individuals on the correct way of performing oral hygiene practices. Videos of tooth brushing and flossing were extracted from the educational materials produced by the government Oral Health Education Unit while the soundtracks on the use of interdental brush were recorded by dental students. After playing the video with sound and the audio recording to the study subject individually, further explanations and supplemental information were provided by a member of our student group. Questions from the study subject were also answered.

Appropriate toothbrush, floss holders, interdental brushes, and toothpaste were given to the study subjects. The subjects were asked to follow the oral hygiene instructions and to use the provided oral hygiene aids in the following weeks. Highlights of the contents of the videos and soundtracks are given below.

- 1) Instructions on toothbrushing
 - provided to all subjects
 - brush the teeth for at least 2-3 minutes, twice a day, using a toothbrush with a small head and soft bristles
 - develop a sequence of brushing for oneself to follow
 - modified Bass Method⁹
 - direct the nylon bristles apically (upwards for maxillary, downwards for mandibular teeth) at a 45 degrees angle
 - press lightly without flexing and bending the bristles
 - vibrate the toothbrush back and forth with very short strokes

- count at least 10 vibrations
 - reposition the toothbrush and apply the brush to the next group of two or three teeth
 - for lingual surface of upper and lower anterior teeth: place the toothbrush vertically parallel to tooth surface and perform 5-10 up and down strokes on all anterior teeth
- 2) Instructions on flossing using a floss holder
- provided to subjects who need to clean adjacent tooth surfaces with a tight contact
 - floss at least every night
 - slowly slide the floss towards the gingival margin by moving it left and right
 - pull the floss against one of the tooth surface
 - gently slide the floss up and down against the tooth surface for 3-5 times
 - repeat the pulling motion and the up and down motion against the other tooth surface
 - repeat the flossing action in all the interdental areas
- 3) Instructions on interdental brushing
- provided to subjects who need to clean adjacent tooth surfaces with a wide interdental space
 - slightly bend a new interdental brush to an angle at the place where the wire enters into the plastic sheath
 - insert the interdental brush into the gap between the roots of the teeth from buccal side or lingual/palatal side
 - brush forward and backward to clean the adjacent tooth surfaces
 - repeat the action in all the interdental areas
- 4) Instructions on denture cleaning
- provided to subjects who were denture wearers
 - clean the denture every night with a toothbrush and soap
 - be careful with the rest and clasps of the denture
 - place the denture in tap water overnight
 - clean with denture cleanser once a week

4.4.2. Customized OHI

For the group receiving customized OHI, the individual instructions were delivered according to clinical examination findings and comments on the subject's need provided by the examiners. The OHI could be on toothbrushing, interdental brushing, flossing and denture cleaning, as described above. The study subject was first asked to demonstrate his/her usual way of carrying out oral hygiene practices. This was observed and evaluated by a dental student. The inappropriate aspects were corrected and modified. A new toothbrush, floss holder and an appropriate interdental brush were used to demonstrate the proper oral hygiene methods in the subject's mouth. Satisfactory oral hygiene performance by the subject was observed before the subject left.

After delivering the customized OHI, additional interdental brushes, floss holders and toothpaste were given to the subject. The subjects were asked to follow the instructions and to use the given oral hygiene aids in the following weeks.

4.5 Data Processing and Analysis

The data collected was input into a personal computer using the software Microsoft Excel and then analyzed with the statistical software SPSS for Windows. The change in VPI and GBI scores between the baseline and evaluation visits was calculated by subtracting the score at baseline from that at evaluation. A negative change would indicate a reduction in the score from the baseline to the evaluation visit, i.e. an improvement in oral hygiene or gingival health.

Chi-square test was used to assess the differences in the oral hygiene habits and condition between the two OHI groups. Paired t-test was used to compare the change in VPI and GBI scores after the OHI within a group. Two-sample t-test was used to compare the differences in the change in VPI and GBI scores between the two OHI groups. A p-value ≤ 0.05 would be considered as statistically significant.

5. RESULTS

5.1. The pre-study visit

In the pre-study visit, 14 visually impaired adults were interviewed and clinically examined. It was found that all of them brushed their teeth at least twice daily with a manual toothbrush, and without assistance. One interviewee also used an electric toothbrush as a supplement. One third of them used a toothbrush with a large head or hard bristles. The most common method of toothbrushing reported was back and forth strokes. Most (9/14) of them did not perform interdental cleaning. Only one interviewee preferred a short handle toothbrush while most (10/14) of them preferred toothbrush with a long handle. Half of them said they found some areas in their mouth difficult to clean.

In the clinical examination, it was found that most of the plaque was on the posterior teeth and also on the lingual tooth surfaces. It seems that these areas were more difficult for the visually impaired adults to clean.

The above information was used in the design of the OHI and preparation of the teaching materials for use in the clinical trial of this study.

5.2. The baseline visit

A total of 42 subjects from the two centres were recruited into the clinical trial. There were 18 (43%) men and 24 (57%) women (Table 2). Two thirds of them had attended secondary school as their highest level of education. Most (69%) of them had low vision while 14 subjects were completely blind. There is a wide range with regarding to their age at onset of the visual impairment, from below 10 years to over 40 years old. The majority (69%) were receiving medical treatment or having other medical problems. There were no statistically significant differences in any of the above background conditions between the subjects in the conventional OHI group and those in the customized OHI group (Chi-square test, $p > 0.05$).

Table 2. Demographic and medical background of the study subjects at baseline.

	Customized OHI group (n=22)	Conventional OHI group (n=20)	Total (n=42)
<u>Gender</u>			
Male	41 %	45 %	43 %
Female	59 %	55 %	57 %
<u>Education level</u>			
Primary school	23 %	15 %	19 %
Secondary school	68 %	60 %	64 %
Tertiary education	9 %	25 %	17 %
<u>Degree of visual impairment</u>			
Complete blindness	27 %	40 %	33 %
Partial blindness (low vision)	68 %	70 %	69 %
Partial blindness (one eye affected)	9 %	0 %	5 %
<u>Age at onset of visual impairment</u>			
< 10 years old	23 %	50 %	36 %
10-20 years old	14 %	15 %	14 %
21-40 years old	27 %	25 %	26 %
41-60 years old	36 %	10 %	24 %
<u>Currently receiving medical treatment or having other medical problems</u>			
Yes	68 %	70 %	69 %
No	32 %	30 %	31 %

Table 3. Toothbrush and toothbrushing practices of the study subjects at baseline.

	Customized OHI group (n=22)	Conventional OHI group (n=20)	Total (n=42)
<u>Frequency of toothbrushing</u>			
Once a day	18 %	10 %	14 %
Twice a day	82 %	85 %	83 %
More than twice a day	0 %	5 %	2 %
<u>Duration of each toothbrushing</u>			
<1 minute	5 %	5 %	5 %
1-2 minutes	41 %	20 %	31 %
>2 minutes	54 %	75 %	64 %
<u>Size of toothbrush head</u>			
Large	55 %	50 %	52 %
Small	45 %	50 %	48 %
<u>Hardness of toothbrush bristles</u>			
Soft	86 %	78 %	80 %
Hard	14 %	22 %	20 %
<u>Frequency of changing toothbrush</u>			
More often than every 2-3 months	18 %	25 %	21 %
every 2-3 months	32 %	35 %	33 %
every 4-6 months	32 %	25 %	29 %
Less often than every 4-6 months	18 %	15 %	17 %
<u>Method of toothbrushing *</u>			
Circular motion	32 %	21 %	27 %
Back and forth strokes	82 %	79 %	81 %
Up and down strokes	55 %	47 %	51 %
<u>Brush in a systematic way</u>			
Yes	82 %	68 %	75 %
No	18 %	32 %	25 %

* multiple answers accepted, tally >100%

At baseline, most (83%) of the study subjects brushed their teeth twice a day (Table 3). Two thirds (64%) of them brushed for over 2 minutes each time. None of them needed assistance in toothbrushing and they all used a manual toothbrush. Around half of their toothbrushes had a large head and most (80%) of the toothbrushes had soft bristles. Most of the subjects changed their toothbrush every 2-3 months (33%) or every 4-6 months (29%).

Back and forth strokes were adopted by the majority (81%) of the study subjects when brushing their teeth. Half (51%) of the subjects also used up and down strokes. Most (75%) of them used a systematic way to brush their teeth.

There were no statistically significant differences between the characteristics of the toothbrushes and the toothbrushing practices of the subjects in the conventional OHI group and those of the subjects in the customized OHI group (Chi-square test, $p > 0.05$).

Table 4. Use of interdental cleaning aids and mouthrinse among the study subjects at baseline.

	Customized OHI group (n=22)	Conventional OHI group (n=20)	Total (n=42)
<u>Use of interdental cleaning aids *</u>			
No interdental cleaning with any aids	64 %	65 %	64 %
Interdental brush	14 %	5 %	10 %
Dental floss	14 %	15 %	14 %
Floss holder	23 %	30 %	26 %
Toothpick	32 %	20 %	26 %
<u>Use of mouthrinse</u>			
Not using mouthrinse	77 %	50 %	64 %
1-2 times a day	0 %	25 %	12 %
Few times in a week	14 %	5 %	10 %
Occasionally	9 %	20 %	9 %

* multiple answers accepted, tally >100%

At baseline, most (64%) of the study subjects did not perform interdental cleaning with any oral hygiene aids (Table 4). Only 26% of the study subjects used dental floss attached to a plastic holder. Only about one third (36%) of the subjects used mouthrinse and only five (12%) subjects used it daily.

There were no statistically significant differences between subjects in the conventional OHI group and those in the customized OHI group regarding their practice of interdental cleaning and the use of mouthrinse (Chi-square test, $p>0.05$).

Most (71%) of the study subjects did not go for a dental check-up while only 12% of them had annual dental check-up (Table 5). The pattern of dental visit behaviour of the subjects in the two OHI groups was not significantly different (Chi-square test, $p>0.05$).

Table 5. Dental check-up behavior of the study subjects at baseline.

	Customized OHI group (n=22)	Conventional OHI group (n=20)	Total (n=42)
<u>Frequency of dental check-up</u>			
No dental check-up	77 %	65 %	71 %
1-2 times a year	5 %	20 %	12 %
Less frequent than every year	18 %	15 %	17 %

From the duplicate clinical examinations of 14 subjects, it was found that the two examiners' percentage of agreement on the diagnosis of presence or absence of visible plaque at the tooth site level was 80.5% while that on presence or absence of gingival bleeding upon stimulation by probing was 83.3%. At the subject level, the mean absolute difference in VPI scores for the same subject as assessed by the two examiners was 0.069 (SD=0.107) while that for GBI scores was 0.086 (SD=0.091).

The baseline mean VPI scores of the subjects in the conventional and the customized OHI groups were 0.238 and 0.249, respectively (two-sample t-test, $p>0.05$). The respective

baseline mean GBI scores of the subjects in the conventional and the customized OHI groups were 0.142 and 0.135 (two-sample t-test, $p>0.05$).

5.3. The evaluation visit

A total of 38 subjects (90.4% of the study sample) from the two groups, 20 in the conventional OHI group and 18 in the customized OHI group, turned up at the evaluation visit two weeks after the baseline. Summary of the clinical examination findings on these 38 study subjects is shown in Tables 6 and 7.

Table 6. Changes in the oral hygiene and gingival health conditions of the subjects who were examined at both the baseline and the evaluation visits.

	Customized OHI group (n=18)	Conventional OHI group (n=20)	Total (n=38)
<u>Change in oral hygiene *</u>			
Improved (reduction in VPI score)	83 %	75 %	79 %
No change	6 %	20 %	13 %
Deteriorated (increase in VPI score)	11 %	5 %	8 %
<u>Change in gingival health *</u>			
Improved (reduction in GBI score)	68 %	70 %	69 %
No change	16 %	10 %	13 %
Deteriorated (increase in GBI score)	16 %	20 %	18 %

* not statistically significant between groups (Chi-square test; $p>0.05$)

At the evaluation examination, it was found that the oral hygiene of most (79%) of the study subjects had improved when compared to that at baseline while in 13% of them the condition remained unchanged (Table 6). The patterns between the two OHI groups are not significantly different (Chi-square test, $p>0.05$).

Similar observations were found in relation to the gingival health status of the study subjects. At evaluation, most (69%) of them had their gingival health condition improved when compared to that at baseline while no change was found in 13% of the subjects. The patterns in the two OHI groups are similar (Chi-square test, $p>0.05$).

Table 7. Mean VPI and GBI scores of the subjects (n=38) who were examined both at the baseline and the evaluation visits.

	Customized OHI group (n=18)	Conventional OHI group (n=20)	Statistical sig.*
Mean VPI score at baseline	0.249	0.238	$p=0.738$
Mean VPI score at evaluation	0.107	0.120	$p=0.724$
Statistical sig.#	$p<0.001$	$p=0.001$	
Mean GBI score at baseline	0.135	0.142	$p=0.556$
Mean GBI score at evaluation	0.060	0.084	$p=0.229$
Statistical sig.#	$p=0.005$	$p=0.037$	
Mean change in VPI score	-0.114	-0.118	$p=0.925$
Mean change in GBI score	-0.060	-0.058	$p=0.942$

* 2-sample t-test ; # paired t-test

It can be seen from Table 7 that there are no statistically significant differences between the mean VPI scores of the two OHI groups at both the baseline and the evaluation examinations (2-sample t-test, $p>0.05$). However, there was a 52% reduction in the mean VPI score of the subjects in the customized OHI group, from 0.249 at the baseline examination to 0.107 at the evaluation examination (paired t-test, $p<0.001$). Similarly, there was a 50% reduction in the mean VPI score of the subjects in the conventional OHI group, from 0.238 at the baseline examination to 0.120 at the evaluation examination (paired t-test, $p=0.001$).

Regarding the gingival health condition of these subjects, the differences between the mean GBI scores of the two OHI groups at both the baseline and the evaluation examinations

are not statistically significant (2-sample t-test, $p>0.05$). However, there was a 56% reduction in the mean GBI score of the subjects in the customized OHI group, from 0.135 at the baseline examination to 0.060 at the evaluation examination (paired t-test, $p=0.005$). Similarly, there was a 41% reduction in the mean GBI score of the subjects in the conventional OHI group, from 0.142 at the baseline examination to 0.084 at the evaluation examination (paired t-test, $p=0.037$).

The amount of reduction in the mean VPI score between the two OHI groups, 0.114 and 0.118, is not statistically significant (two-sample t-test, $p>0.05$). Furthermore, the difference in the amount of reduction in the mean GBI scores between the two OHI groups is also not statistically significant (0.060 vs. 0.058; two-sample t-test, $p>0.05$).

6. DISCUSSION

This study is a randomized clinical trial which has the potential to generate high quality evidence to guide clinical practices, in this case how to provide OHI to Hong Kong adults with visual impairment. However, as an undergraduate community health project there are a number of limitations and resource constraints as we are inexperienced clinicians and researchers. Thus, this study should be treated as a pilot study in the investigation and the results should be interpreted with caution.

In this study, the two clinical examiners were chosen from our student group and special training in the use of the VPI and GBI indices were provided by our supervising teachers. These indices are simple to use and have been used in a number of clinical trials to assess the effectiveness of manual toothbrushing.¹⁰ The GBI has also been used in an oral health survey of the visually impaired children in Hong Kong.¹¹ A reasonable level of examiner reliability was obtained despite our limited clinical experience as dental students. The examiners were blinded as to the group assignment of the study subjects and they were not involved in the provision of OHI. However, it was not possible not to let them know whether they were conducting the baseline or the evaluation examination on the study subjects. There may be bias due to this factor and the subjects' improvement in clinical conditions after the OHI may be smaller than that reported.

Due to time limitation, carrying out extensive promotional activities to recruit participants into this study was not feasible. Since our teaching timetable was fixed, there was no extra time for our student group to conduct this study in more centres which served the visually impaired adults. Hence, the number of subjects recruited into this study is relatively small. It has been pointed out that the influence from a hypothetical test situation would be smaller with a larger sample size.¹² Henceforth, with a small sample size such as the one in this study, influence from one outlying subject may greatly alter the resulting probability test distribution. A small sample size will also lead to a reduced power to detect differences in the outcome parameters between different study groups.

In this study, visual acuity assessments were not performed on the subjects and medical records documenting their low vision status were not obtained. It is possible that some study

subjects could see the oral hygiene aids and their own oral hygiene practices better than others. There may also be a potential difference in oral cavity perception for subjects who were visually impaired at birth compared to those with acquired impairment later in life. This would cause a larger variation in the effects of the OHI and lower the sensitivity of the study to detect a difference in outcome between groups. Moreover, we were unable to assess if the different OHI methods used in this study had different effects in adults with different levels of visual impairment.

Due to time constraint, the interval between the baseline visit in which OHI was given and the evaluation visit is rather short, only 2 weeks. It is difficult to speculate if the results would be different if the evaluation time interval was lengthened. On one hand, the enthusiasm of the study subjects to keep a high level of oral hygiene may decrease over time after our OHI. On the other, it has been suggested that oral hygiene performances improve with practice.¹³ Hence, the study subjects' ability to remove plaque using the newly introduced interdental cleaning aids may or may not improve over time. Thus, an extended period of follow up of the study subjects would provide further information regarding the effectiveness of the two study OHI methods.

Before conducting this project, we had limited experience in communicating with visually impaired adults and were unsure if the oral health education materials designed for normal adults were also suitable for use in this special needs group. Thus, in this project we arranged a pre-study visit to collect more information from the visually impaired adults so as to guide our development of the customized OHI. In the pre-study visit, it was found that nearly all of the interviewees used an ordinary manual toothbrush to brush their teeth. Therefore, the OHI provided to the subjects in both of our study groups focused on the technique of manual toothbrushing. In the pre-study visit, most of the interviewees said that they found certain areas in their mouth difficult to clean, and in the clinical examination it was found that the lingual surfaces of their lower teeth and the buccal surfaces of their upper molars were usually covered by dental plaque. Thus, during the OHI more emphasis was placed on how to clean these specific areas. Furthermore, it was found that over half of the interviewees did not carry out any interdental cleaning, which is similar to that found among normal middle aged Hong Kong adults.¹⁴ Therefore, interdental cleaning with either floss holder or interdental brush was included in the OHI for our study subjects.

The conventional OHI delivered to our study subjects used the soundtracks of the videos produced by the government Department of Health for normal adults and also recordings made by our dental student group. Although messages on correct toothbrushing, interdental cleaning and flossing were included, it is a passive and one-way delivery of knowledge. Despite its shortcomings, findings of this study show that provision of conventional OHI to the visually impaired adults can result in improvement of their oral hygiene and gingival health status. In this study, it is likely that most of the subjects could understand and follow the instructions provided in the conventional OHI materials as they were not born blind and only acquired their visual problems later in life when they had already adopted oral hygiene practices like individuals with normal vision.

The provision of customized OHI to our study subjects was carried out on a one-to-one basis. One member of our student group provided the instructions to one subject each time, based on the clinical findings and the conditions of that subject. The recommendation and advice on the use of interdental cleaning aid was also based on the subject's individual need. As expected, the oral hygiene and gingival health status of the subjects had significantly improved after receiving the OHI. However, the magnitude of improvement in this group of study subjects was not significantly different from that in the conventional OHI group. It seems that the effectiveness of the OHI provided to the visually impaired adults in Hong Kong, at least those involved in this study, does not depend too much on the format in which it is delivered. Thus, more oral health education activities can be organized for this population group using the currently available OHI aids developed for normal adults. The lack of customized OHI aids for the visually impaired adults should not be a major hinderance to conducting oral health promotional activities.

7. CONCLUSIONS

Within the limitations of this study and based on the short-term 2-week findings, the first hypothesis of this study, i.e. provision of conventional OHI to visually impaired adults had no effect on changing their oral hygiene and gingival health status, is rejected.

Similarly, the second hypothesis of this study regarding the effect of providing customized OHI to visually impaired adults is also rejected.

On the contrary, the third hypothesis of this study, i.e. there is no difference between the effect of providing conventional and that of providing customized OHI to this special needs group, cannot be rejected.

Thus, with reference to the study objectives, the following conclusions are made:

- 1) provision of conventional OHI to the visually impaired adults in Hong Kong can improve their oral hygiene and gingival health status,
- 2) provision of customized OHI can also improve their oral hygiene and gingival health status; and
- 3) there are no significant differences between the effectiveness of providing the above two types of OHI to the visually impaired adults.

8. RECOMMENDATIONS

Based on the experience we gained in conducting this pilot study and on the study findings, we would like to make the following recommendations:

- 1) Further studies on various methods of providing OHI to visually impaired adults in Hong Kong be conducted to find out the most appropriate and effective method. These studies should have a larger sample size and a longer follow-up period. The study subjects should be classified according to their different levels of visual acuity so as to investigate the effectiveness of the various OHI on different subgroups of visually impaired adults.
- 2) More oral health programmes should be carried out among the visually impaired adults in Hong Kong to improve their oral hygiene and oral health status. Both customized and conventional OHI methods and aids can be used in these programmes.

9. ACKNOWLEDGEMENTS

We would like to express our sincere gratitude to the staff of the Hong Kong Society for the Blind (HKSB) for their strong support. We also thank our two teacher advisors, Prof. Edward C.M. Lo and Dr. Anthony Wong, for their advice and guidance throughout the project. Thanks also goes to GlaxoSmithKline Hong Kong for their donation of toothbrushes, and to the Oral Health Education Unit, Department of Health, HKSAR for providing us with the oral health education materials used in this study.

10. REFERENCES

1. World Health Organization. Change the definition of blindness. <http://www.who.int/blindness/en> (accessed on May 21, 2012)
2. Census and Statistics Department. *Special Topics Report no. 48: Persons with disabilities and chronic disease 2008*. Hong Kong: Hong Kong Government, 2008.
3. Lindhe J. Effect of controlled oral hygiene procedures on caries and periodontal disease in adults. *J Clin Periodontol* 1978; 5:133–151.
4. Sprod AJ. *Effective oral health promotion: literature review*. York: Centre for Reviews and Dissemination, University of York, 2001
5. Schembri A, Fiske J. The implications of visual impairment in an elderly population in recognizing oral disease and maintaining oral health. *Spec Care Dent* 2001; 21:222-226.
6. Deinzer R . Oral and written instruction of oral hygiene: a randomized trial. *J Periodontol* 2012 (published on-line): doi/abs/10.1902/jop.2012.110550
7. O’ Donnell D, Crosswaite MA. Dental health education for the visually impaired child. *J R Soc Health* 1990; 110:60-61.
8. Ainamo J, Bay I. Problems and proposals for recording gingivitis and plaque. *Int Dent J* 1975, 25:229-235.
9. Poyato-Ferrera M, Segura-Egea JJ, Bullón-FernándezP. Comparison of modified Bass technique with normal toothbrushing practices for efficacy in supragingival plaque removal. *Int J Dent Hygiene* 2003; 1:110–114.
10. Van der Weijden GA, Hioe KP. A systematic review of the effectiveness of self-performed mechanical plaque removal in adults with gingivitis using a manual toothbrush. *J Clin Periodontol* 2005; 32 (Suppl 6): 214-28.

11. Yiu C, Wong MCM, Au SY, *et al.* *Oral health care for the visually impaired and mentally retarded*. Community Health Project Series No. 102 . Hong Kong: Faculty of Dentistry, HKU, 1999.
12. Hoekstra R., Kiers HAL, Johnson A, Groenier M. Problems when interpreting research results using only p-value and sample size. In: *Proceedings of the 7th International Conference on Teaching Statistics*. Auckland: International Association for Statistical Education, 2006.
13. Ritter F E, Schooler LJ. The learning curve. In *International encyclopedia of the social and behavioral sciences*. 8602-8605. Amsterdam: Pergamon, 2002.
14. Department of Health. *Oral Health Survey 2001*. Hong Kong: Hong Kong SAR Government, 2002.



香港大學
University of Hong Kong



香港大學及醫管局港島西醫院聯網研究倫理委員會
**Institutional Review Board of the University of Hong Kong/
Hospital Authority Hong Kong West Cluster (HKU/HA HKW IRB)**

Address: Rm 901, Administration Block, QMH Tel 2255 3923 2255 4086 Fax 2255 4735

Prof. Edward Lo
Faculty of Dentistry
The University of Hong Kong
21-Feb-12

Dear Prof. Lo,

IRB Reference Number: UW 12-056

The HKU/HA HKW IRB is authorized by a joint agreement of the University of Hong Kong and Hospital Authority Hong Kong West Cluster to review and monitor clinical research. It serves to ensure that research complies with the Declaration of Helsinki and acts in accordance to ICH GCP guidelines, local regulations and Hospital Authority and the University policies.

I write to inform that your research application/submission has been approved by an expedited process with details shown below. You are also requested to adhere to the conditions listed.

Protocol title : A randomized clinical trial on the effects of providing customized and conventional oral hygiene instructions on the oral hygiene status of visually impaired adults

Study site(s) : As stated in application form

IRB reviewer : Professor CL Lai, Deputy Chairman of the HKU/HA HKW IRB

Document(s) approved : 01. Clinical research ethics review application form
: 02. Research protocol
: 03. Information sheet and consent form - English and Chinese

Document(s) reviewed : 04. Short CV of principal investigator

- (Conditions :
1. Do not deviate from, or make changes to the study protocol without prior written IRB approval, except when it is necessary to eliminate immediate hazards to research subjects or when the change involves only logistical or administrative issues.
 2. Report the following to HKU/HA HKW IRB: (i) study protocol or consent document change (use 'HKU/HA HKW IRB RE001F7'), (ii) serious adverse event (use 'HKU/HA HKW IRB RE001F8'). (iii) study progress (use 'HKU/HA HKW IRB RE001F9a') (iv) new information that may be relevant to a subject's willingness to continue participation in the study.
 3. Report study progress to HKU/HA HKW IRB at a 12-monthly interval until study closure.)

Yours sincerely,

Mr. Chris Yip
HKU/HA HKW IRB Secretary



The University of Hong Kong Faculty of Dentistry

3/F, Prince Philip Dental Hospital, 34 Hospital Road, Hong Kong (Tel) 2859 0291 (Fax) 2858 7874

為視障成年人提供個別和傳統的口腔衛生指導的有效性隨機臨床研究

香港盲人輔導會會員：

為增進視障人士的口腔健康，香港大學牙醫學院現正進行一項臨床研究，本研究目的是比較兩種口腔衛生指導方法對清除牙垢及保持牙肉健康之效能。此項研究將歷時兩周。

如您同意參與，您會接受一次口腔檢查，然後我們會隨機安排研究員教導你兩種牙刷的方法其中一種。一種是傳統的口述指導，另一種是因應你的情況給予個別的指導。我們會教導你使用牙刷的方法，希望你每日早晚使用口腔護理用品清潔口腔。我們會於兩周後安排你再次接受口腔檢查，以跟進口腔的情況。本研究期間，我們將會派發一支含氟化物之牙膏供你使用。這些牙科產品在按照指導使用之情況下，並不會危及身體健康。

參與這項研究是完全自願及免費的。您可選擇不參與，亦可選擇隨時退出而不給予理由。在以上兩種情況下，你的香港盲人輔導會會員權利不會受到任何影響。此項研究收集的資料將會保密及只供研究人員使用。我們尊重參與者之私隱，不會發佈或出版任何揭露您身份的資訊。

如果您對參與這項研究有任何疑問，可致電與我查詢 (電話：2859 0292)。

香港大學牙醫學院
盧展民 教授 謹上
2012 年 1 月 9 日

參與者同意書

1. 本人已詳閱及明白上述研究的須知，並有充分機會提問。
2. 本人同意參與上述研究。
2. 本人明白參與上述研究純屬自願，可在任何情況下停止參與研究，而不須要承擔任何後果。

參與者 姓名： _____ 簽名： _____

Faculty of Dentistry, University of Hong Kong
Oral Health Education for the Blind

Personal Information 個人資料

Name 姓名: _____

Gender 性別: _____

Age 年齡: _____

Are you living in a nursing home? Yes 是 No 否

是否居住於護理院？

Part A: Medical History; 甲部: 個人病歷

1. What is your degree of visual impairment? 閣下的視力障礙的程度屬於
 Complete blindness 完全失明
 Partial blindness (low vision) 局部失明 (低視能)
 Partial blindness (one eye affected only) 局部失明 (只影響一隻眼睛)
2. At what age did you become visually impaired? 閣下從甚麼年齡開始有視力障礙？
 <10 10-20 21-40 41-60 >60
3. Are you currently receiving any other medical treatment or suffering from other medical diseases?
閣下是否正在接受醫藥治療或患有任何疾病？
 Yes, please specify: 有，請註明： No 沒有

4. Are you currently taking any medication? 閣下現在是否服食任何藥物？
 Yes, please specify: 有，請註明： No 沒有

5. What is your education level? 閣下的教育程度為
 not educated 未曾接受教育 primary school 小學程度
 secondary school 中學程度 tertiary education 大專或以上

Part B: Oral Hygiene Habits; 乙部: 口腔清潔習慣

1. How many times do you brush your teeth every day? 你每天刷牙的次數是多少次?

- 0 1 2 >2

2. How long do you brush your teeth every time? 每次刷牙的時間長度為多少?

- < 1 minute 少於一分鐘 1-2 minutes 一分鐘至兩分鐘

- > 2 minutes 多於兩分鐘

3. Oral Hygiene Tools 口腔清潔工具:

Toothbrush 牙刷:

a. What kind of toothbrush are you using? 閣下現正使用的是哪種牙刷?

- Manual toothbrush 手動牙刷 Electrical toothbrush 電動牙刷

b. The conditions of your current toothbrush:

閣下現在使用的牙刷狀況:

Brush head 刷頭: Large 大 Small 小

Bristles 刷毛: Soft 軟 Hard 硬

c. Frequency to replace toothbrush 多久更換牙刷一次

less than 2-3 months 少於 2-3 個月

every 2-3 months 每 2-3 個月

every 4-6 months 每 4-6 個月

more than 6 months 多於 6 個月

Interdental Cleaning 牙齒鄰面清潔:

a. Are you using any of the following cleaning tools? 閣下有否使用以下工具?

Interdental brush 牙縫刷

Floss 牙線

Floss holder 牙線棒

Other cleaning tools 其他口腔清潔:

a. Are you using mouthrinse? 閣下有否使用漱口水?

Yes, please specify 有，請註明: _____

No 沒有

b. How often do you use mouthrinse? 閣下使用漱口水的頻率是多少?

>2 per day 每天多於兩次

1-2 per day 每天一至兩次

2-3 per week 每週兩至三次

occasionally 間中

c. What other cleaning tools do you use? Please specify: _____

閣下有否使用其他的口腔清潔工具? (請註明): _____

4. Habits 習慣:

a. Brushing method 刷牙的方法:

circular motion 打圈

back and forth 向前向後

up and down 由牙

肉邊掃向咀嚼面

b. Do you have a sequence when brushing? 閣下有否固定刷牙的次序?

Yes 有 No 沒有

c. Do you require assistance when cleaning? 清潔口腔時是否需要其他人協助?

Yes 需要

No 不需要

d. Do you have regular dental check-up? 閣下有否定期進行口腔檢查?

Yes 有 No 沒有

If yes, how frequent? 如有，檢查的頻率是多少?

>twice/year 每年多於兩次 1-2 times/year 每年一至兩次

once every two years or fewer 每兩年一次或更少

Part C: Difficulties Experienced During Cleaning; 丙部:進行口腔清潔時

遇到的困難

1. Do you prefer a toothbrush with a longer or shorter handle in terms of improving your oral hygiene performance? 較長或是較短的牙刷柄可以提升閣下清潔口腔的效果?

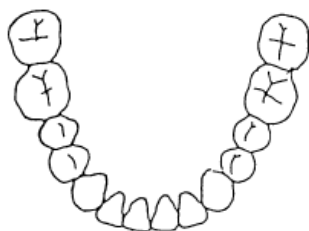
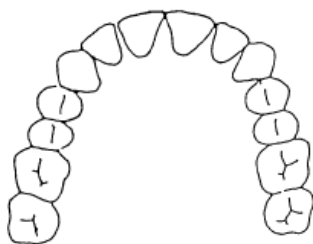
Longer 較長 Shorter 較短 No preference 沒有分別

2. Are there any areas you find difficult to clean? 有否某些口腔部位比較難刷?

Yes 有 No 沒有

If yes, please specify: (Please shade the area(s))

如有，難刷的部位是 (請塗上陰影)



Part D: Dental Knowledge; 丁部: 對口腔衛生的認知

1. How many time(s) a year do you think we need a dental check-up(s)?
閣下認為一年內要進行口腔檢查的次數是多少?
 Less than once 少於一次 once 一次
 twice 兩次 more than twice 多於兩次

2. How many time(s) a day do you think we have to brush our teeth? 閣下認為每天應該刷多少次牙?
 Less than once 少於一次 once 一次
 twice 兩次 more than twice 多於兩次

3. How long do you think we should brush our teeth each time?
閣下認為每次刷牙的時間長度是多少?
 < 1 minute 少於一分鐘 1 to 2 minutes 一分鐘至兩分鐘
 > 2 minutes 多於兩分鐘

4. Do you think it is necessary to use floss or an interdental brush?
閣下認為是否必須使用牙線或牙縫刷?
 Yes 是 No 否

5. What do you think a good toothbrush should be? (ask more specifically)
閣下認為一支好的牙刷應該具備甚麼條件?
(a). Hard bristles 硬毛 Soft bristles 軟毛
(b). Large head 大刷頭 Small head 細刷頭

6. Do you know what is(are) the possible consequence(s) of bad oral hygiene?
閣下認為口腔衛生差可能導致甚麼後果?
 Tooth decay 蛀牙 Staining 牙齒變黃/牙漬
 Gum disease 牙周病 Sensitive teeth 敏感牙齒
 Bad breath 口氣 Others, please specify 其他, 請註明: _____

Group 4.4, Dental Public Health Project 2012,
Faculty of Dentistry, the University of Hong Kong

Case no.: _____

Medical History

閣下現在有否服食任何藥物？（如有請註明） 閣下有否對任何物品（特別是乳膠）有敏感？ 閣下曾否服用類固醇、抗凝血藥物或電療？ 閣下施手術、脫牙或受傷曾否流血不止？ 備註/藥物	是 否 <table border="1" style="border-collapse: collapse; width: 40px; height: 40px; margin: auto;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>									閣下曾否接受全身麻醉？ 閣下曾否突然暈倒或常覺頭暈？ 閣下有否心臟膜病歷或人工心瓣？	是 否 <table border="1" style="border-collapse: collapse; width: 40px; height: 40px; margin: auto;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>								

Clinical Charting Form

Bleeding Plaque B P	<table border="1" style="width: 100%; height: 100%; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>																																									<table border="1" style="width: 100%; height: 100%; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>																																									18 17 16 15 14 13 12 11 21 22 23 24 25 26 27 28 48 47 46 45 44 43 42 41 31 32 33 34 35 36 37 38
L B Plaque Bleeding	<table border="1" style="width: 100%; height: 100%; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>																																									<table border="1" style="width: 100%; height: 100%; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>																																									18 17 16 15 14 13 12 11 21 22 23 24 25 26 27 28 48 47 46 45 44 43 42 41 31 32 33 34 35 36 37 38

* please mark missing teeth, spacing, type of denture (if any): _____

- Recommended OHI
- Single tuft brush
 - Inter-dental brush
 - Floss
 - Denture hygiene instruction