Knowledge and Perception on Oral Hygiene Instructions and Periodontal Health Education (OHIPE) among UiTM Dental Undergraduates

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ABSTRACT

This study was aimed to evaluate the knowledge and perception of oral hygiene instructions and periodontal health education (OHIPE) among dental undergraduates of Universiti Teknologi MARA (UiTM) after the modification of OHIPE protocol. This cross-sectional study was carried out among 134 clinical dental year students of UiTM. The data was collected by distributing a self-administered structured questionnaire to the participants. The questionnaire was divided into two different sections in order to assess knowledge and perception independently. The 5-point Likert Scale was used to evaluate perception. Data analysis was done via SPSS version 27.0. **Results:** *There was 51.3% (n=40) year 5 students obtained good knowledge score compared to only 21.4%(n=12) of year 4 students. The remaining 48.7%(n=38) of year 5 and 71.4%(n=40) year 4 students recorded average knowledge (P <0.001). Students' perception regarding OHIPE showed that the response on each of the six questions were almost similar. However, there were statistically significant differences between the two groups regarding giving information about patient's periodontal status and advice on cleaning interdental areas of the teeth (P = 0.01 – 0.031). Most students agreed that usage of patient's own periodontal chart and radiograph is important and useful during OHIPE.* **Conclusion:** *Periodontal health care knowledge score for OHIPE among clinical years students are between average and good. The knowledge and awareness of year 4 students were lower than year 5 students which could be due to reduced clinical sessions*

during pandemic of Covid-19. Perception of students were similar among all participants as they have more clinical experience in managing periodontal patients.

Keywords: *periodontal knowledge, oral hygiene instruction, perception.*

Abbreviations: *OHIPE- Oral Hygiene Instructions and Periodontal Education, UiTM- Universiti Teknologi MARA, IDB- Interdental Brush*

INTRODUCTION

In recent years, the Ministry of Health Malaysia reported a high prevalence of oral diseases such as dental caries and periodontal diseases affecting the Malaysian population. The prevalence of periodontal disease has been recorded to be as high as 94% of the adult population by the Malaysian National Oral Health Survey of Adults (NOHSA) in 2010 (NOHSA, 2010). A report regarding the Global Burden of Disease Study indicated that severe periodontitis affects up to 11% of the global adult population and ranked as the sixth most prevalent disease in the world (Marcenes, W, et al, 2013). These statistics proved that even though periodontal disease is a preventable disease, the prevalence is increasing and is becoming a global health issue (Mawardi, HH, Elbadawi, LS, & Sonis, ST, 2015). The main etiology of periodontal diseases is bacteria found in dental biofilm. Gingivitis – the mildest form of periodontal disease – is an inflammation response caused by accumulation of dental plaque along the gingival margin and tooth surface. Yet, gingivitis is reversible and does not affect the teeth and the surrounding supporting structures. However, periodontitis may result in loss of connective tissue attachment, loss of bone support and lead to tooth loss (Pihlstorm, BL, Michalowicz, BS, & Johnson, NW ,2005).

Periodontal disease treatments include an array of non-surgical and surgical procedures that can be carried out by clinicians. However, good oral hygiene practice remains mainstay of maintaining good oral and periodontal health. Oral hygiene practice is defined as efforts performed by an individual to remove supragingival plaque (Lang, NP, & Lindhe, J ,2015). There is a clear relationship between poor oral hygiene and periodontal health (Paper, P ,2005). Studies has evidently shown that poor oral hygiene will lead to plaque development and accumulation, and cause gingivitis (Löe, H, Theilade, E and Jensen, SB, 1965). Subsequently, the development of gingivitis may lead to periodontitis (Page, RC, & Schroeder, HE, 1976). Therefore, the key to maintain good periodontal health is to remove the causative agent – dental plaque. Thus, periodontal health is critically dependent on the ability and willingness of the patient in terms of oral hygiene maintenance (Baelum, V, et al 2007). To ensure the patient is able to equip themselves with necessary proficiency, the clinician should be able to educate the patients regarding their periodontal status and deliver correct oral hygiene instructions to the patient for continuous proper plaque control.

One of the important strategies in ensuring that the clinicians can educate the patients regarding periodontal disease and teach the techniques of proper plaque control; is via adequate training and exposure during undergraduate in order to increase their knowledge and perception regarding OHIPE. Studies among dental nurses in Sarawak, Malaysia and dental undergraduates in Nepal reported that most participants agreed that they should receive training in OH, they also opined that a standardized evidence-based oral hygiene protocol is needed (Chen, CJA, & Jallaludin, RLR, 2000; Malla S, et al, 2017). Study by Mas SA e*t. al* in a recently published paper in 2021 reported that nurses' students of Australia and Malaysia demonstrated positive attitudes and believed in their role in oral healthcare (OH) (Mas SA et al,2021).

Dental undergraduate students of Universiti Teknologi MARA (UiTM) who are exposed to clinical practice and the Periodontology curriculum are required to give out (OHIPE) to their periodontal patients as part of treatment. The OHIPE is not only educating the patients on proper plaque control technique, but also educating the patients regarding periodontal disease, inform them regarding their disease status and teach the patient the plaque control technique that tailor-made based on the patient's need. However, some of the dental undergraduates did not give the needful information during OHIPE and most of the information were standardized and not tailored to patient's need. Starting the year 2020, improvements have been made in the methods of teaching and preclinical demonstration to the students in which incorporation of patient's current periodontal condition by presenting patient's periodontal chart and radiograph are mandatory during OHIPE.

Thus, the dental students' periodontal knowledge and perception regarding OHIPE are important because it affects their capacity to translate the information to their patients (Ahmad, FA et al, 2019) and to ensure the effectiveness of the treatment. This study was conducted to evaluate the knowledge and perception regarding OHIPE among year 4 and year 5 dental undergraduates of UiTM.

MATERIALS AND METHODS

Study Design

In this cross-sectional study, we utilised convenience sampling technique to select a sample of year 4 and year 5 undergraduate dental students from Universiti Teknologi MARA. The study was carried out from January to February 2021.

Sampling Procedure

Sample size of 134 participants were selected from a total of 173 students, comprised of year 4 and year 5 undergraduate dental students. Ethical approval REC/05/2020 (UG/MR/144) was obtained from the Research Ethics Committee of Faculty of Dentistry, Universiti Teknologi MARA. Participants were assured of data confidentiality and no documents were disclosed anywhere other than among the researchers. All participants provided consent for the study.

Questionnaire

The self-administered structured questionnaire was divided into 4 respective sections which are demographic information, periodontal knowledge, perception and opinion on OHIPE. The first section recorded participants' demographic data - age, gender, ethnicity, and year of study. The second section included 14 questions regarding periodontal knowledge. The third section contained questions regarding participants' perception during OHIPE, such as giving proper information regarding patient's periodontal status, advice on improving patient's brushing technique and cleaning interdental areas of the teeth. The fourth section was dedicated to participants' opinion and suggestions regarding improvements that can be done on giving OHIPE. The questionnaire was validated by periodontal and public health specialists from Faculty of Dentistry, UiTM prior to distribution to the participants.

Statistical Methods

The data collected from the questionnaires were recorded in Microsoft Excel and statistical analysis was performed using Statistical Package for Social Sciences (SPSS) software program version 27.0 Chicago: SPSS IBM Corp. Descriptive statistics were calculated by using frequencies and percentages for categorical variables. The chi-square test was used to assess associations between categorical variables.

A knowledge score was calculated in section B from 14 knowledge questions; a score of 1 was given for every correct answer and 0 for every incorrect answer. By calculating the sum of the knowledge questions, we calculated a total knowledge score for each participant ranging from 0 to 14. The total knowledge score obtained was graded as Good, Fair, and Poor respectively. Good knowledge score ranges from 11-14, Fair knowledge score ranges from 7-10, while Poor knowledge score ranges from 1-6. Chi-square test was carried out to assess the association of year of study with each knowledge question and also the knowledge score grade.

Descriptive statistics were also calculated for section C. The questions were regarding participants' perception on how they have given proper information regarding patient's periodontal status, brushing technique and also interdental cleaning. Chi square test was also done to assess the association between the two years with participants' perception on OHIPE.

RESULTS AND STATISTICAL ANALYSIS

A total of 134 students from a total of 173 students participated in the study (77.5%) (Table 1). The demographic characteristics of the concerned participants are presented in Table 2 which majority of participants in the study were of Malay ethnicity.

Table 1 - Number of year 4 and year 5 students currently enrolled in Faculty of Dentistry, UiTM Teknologi MARA in 2020/21 session

	Gender N (%)		
Year of study	Male	Female	Total
Year 5	16 (16.3)	82 (83.7)	98 (100)
Year 4	7 (9.3)	68 (90.7)	75 (100)
Total	23 (13)	150 (87)	173 (100)

Table 2 - Demographic characteristics of the participants (total n = 134)

Demographic Characteristics	Year of Study n(Frequency)	
	Year 4	Year 5
Gender		
Male	5(8.9)	15(19.2)
Female	51(91.1)	63(80.0)
Total	56	78
Total number of participants	134	
Ethnicity		
Malay	56(100)	75(96.2)
Others		3(3.8)

Knowledge Regarding OHIPE to Periodontal Patients

The distribution of participants with respect to oral health knowledge regarding OHIPE is presented in Table 3. The year 5 students were able to obtain more correct answers with 80.8% of them answered correctly compared to year 4 students 51.8% regarding OHI should be standardized to all periodontal patients. A greater proportion of year 5 students 76.9% and only 46.4% year 4 students answered correctly regarding plaque is not food debris trapped in between teeth. Majority of the students knew and were able to answer correctly that plaque can be removed from tooth surfaces by brushing our teeth; and all students knew that untreated periodontal disease would progress further. Most of them knew that periodontal patients probably need more than 1 type of interdental brush and the fact that a compliant patient should not have a plaque score of more than 25%.

The association between the two groups with knowledge score grade is shown in Table 4. The maximum total score for each participant is 14. Year 5 had a greater number of participants with good knowledge score 51.3% as compared to year 4 21.4%. There was a statistically significant difference between the two groups regarding the knowledge score grade (P < 0.001).

Table 3 - Knowledge regarding Oral Hygiene Instructions and Periodontal Education

Questions	Year 4 N (%) (N = 56)		Year 5 N (%) (N = 78)		p-value
	Correct	Incorrect	Correct	Incorrect	
Oral hygiene instructions should be standardized to all periodontal patients.	29(51.8)	27 (48.2)	63(80.8)	15 (19.2)	<0.001
Plaque is food debris trapped in between teeth.	26(46.4)	30 (53.6)	60(76.9)	18 (23.1)	<0.001
Plaque collected on teeth surface can cause periodontal disease.	51(91.1)	5 (8.9)	75(96.2)	3 (3.8)	0.278 (F)
Plaque cannot be removed from tooth surfaces by brushing our teeth.	46(82.1)	10 (17.9)	75(96.2)	3 (3.8)	0.007
Untreated gum disease will progress further.	56 (100)	0	78 (100)	0	-
Patients do not need to be informed about ALL systemic risk factors that may influence their periodontal condition.	2 (3.6)	54 (96.4)	4 (5.1)	74 (94.9)	1.00 (F)
All periodontitis patients need to floss.	15(26.8)	41 (73.2)	33(42.3)	45 (57.7)	0.065
Only flossing is sufficient in periodontitis patients.	55(98.2)	1 (1.8)	78 (100)	0	0.418 (F)
The best time to recommend & provide interdental brush is during OHIPE.	1 (1.8)	55 (98.2)	6 (7.7)	72 (92.3)	0.238 (F)
Periodontal patient only needs 1 type of interdental brush.	50(89.3)	6 (10.7)	72(92.3)	6 (7.7)	0.546
All periodontal patients can use the same size of interdental brush.	55(98.2)	1 (1.8)	76(97.4)	2 (2.6)	1.00 (F)
Periodontal patients can determine their own size of interdental brush based on their liking.	40(71.4)	16 (28.6)	66(84.6)	12 (15.4)	0.064
Every patient needs an end-tufted toothbrush.	41(73.2)	15 (26.8)	69(88.5)	9 (11.5)	0.023
A compliant patient should not have a plaque score > 25%.	53(94.6)	3 (5.4)	65(83.3)	13 (16.7)	0.046

(F) indicates Fisher's exact test was used, other p values, used Chi – square test.

Table 4 - Year of study association with knowledge score grade (total score = 14)

Knowledge scores (n/14)	Good N (%) 11 to 14	Fair N (%) 7 to 10	Poor N (%) 1 to 6	Total participants (%)	n	p value
Year 4	12 (21.4)	40 (71.4)	4 (7.1)	56 (41.8)		<0.001 (F)
Year 5	40 (51.3)	38 (48.7)	0	78 (58.2)		
Total participants N (%)	52 (38.8)	78 (58.2)	4 (3)			

(F) indicates Fisher's exact test was used

Table 5 - Perception on OHIPE among participants

Questions	N (%) Year 4 N=56 Year5 N=78		P value
	Year 4	Year 5	
Do you consider that you have given proper information to your periodontal patients regarding their periodontal status?			
Strongly disagree	0 (0)	0 (0)	0.031 (F)
Disagree	2 (3.6)	0 (0)	
Neutral	8 (14.3)	10 (12.8)	
Agree	41 (73.2)	48 (61.5)	
Strongly agree	5 (8.9)	20 (25.6)	
Do you consider that you have given proper advice to your periodontal patients on how to improve their brushing technique?			
Strongly disagree	0 (0)	0 (0)	0.123 (F)
Disagree	1 (1.8)	0 (0)	
Neutral	3 (5.4)	4 (5.1)	
Agree	43 (76.8)	50 (64.1)	
Strongly agree	9 (16.1)	24 (30.8)	
Do you consider that you have given proper advice to your periodontal patients on cleaning their interdental area?			
Strongly disagree	1 (1.8)	0 (0)	0.01 (F)
Disagree	2 (3.6)	0 (0)	
Neutral	14 (25)	8 (10.3)	
Agree	32 (57.1)	49 (62.8)	

Strongly agree	7 (12.5)	21 (26.9)	
Do you think the OHI book is helpful during OHIPE?			
Strongly disagree	0 (0)	0 (0)	0.073
Disagree	0 (0)	0 (0)	
Neutral	9 (16.1)	5 (6.4)	
Agree	27 (48.2)	32 (41)	
Strongly agree	20 (35.7)	41 (52.6)	
Do you think your previous OHIPE to your patient was effective?			
Strongly disagree	0 (0)	0 (0)	0.836 (F)
Disagree	1 (1.8)	1 (1.3)	
Neutral	19 (33.9)	21 (26.9)	
Agree	29 (51.8)	44 (56.4)	
Strongly agree	7 (12.5)	12 (15.4)	
On a scale of 1-5, do you think your patient understood your OHIPE?			
Strongly disagree	0 (0)	0 (0)	0.076 (F)
Disagree	1 (1.8)	0 (0)	
Neutral	9 (16.1)	13 (16.7)	
Agree	41 (73.2)	47 (60.3)	
Strongly agree	5 (8.9)	18 (23.1)	

(F) indicates Fisher's exact test was used, other p values, used Chi – square test.

Perception Regarding OHIPE to Periodontal Patients

The response from year 4 and year 5 students for each of the six perception questions were more or less similar to one another (Table 5). There were statistically significant differences in the perception responses of the two groups for question 1 which were regarding giving proper information about their patient's periodontal status. Almost 70% of year 5 students perceived that they have given proper information regarding patient's periodontal status as compared to only 46% of year 4 students. Another significant difference between two cohort groups was observed in relation to question 3 regarding giving proper advice on cleaning interdental areas of the teeth in which 70% of year 5 students agree that they have given proper advice on interdental cleaning but less than 50% among year 4 perceived the same value. There were no significant differences for the other questions.

Suggestion to Improve OHIPE.

Information regarding opinion of participants' on OHIPE were recorded in Figure 1 and 2. Majority of the students (70.9%) agreed on using videos or any other audio-visual materials during OHIPE instead of periodontal educational book during OHIPE.
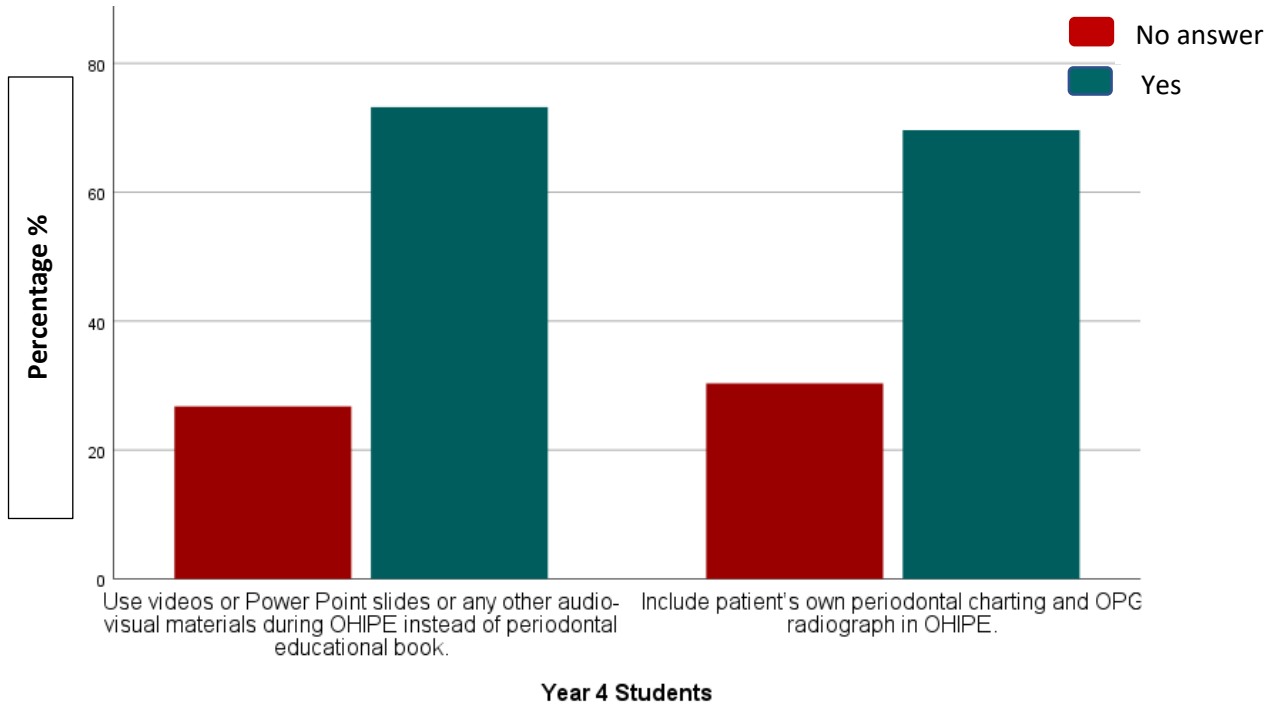

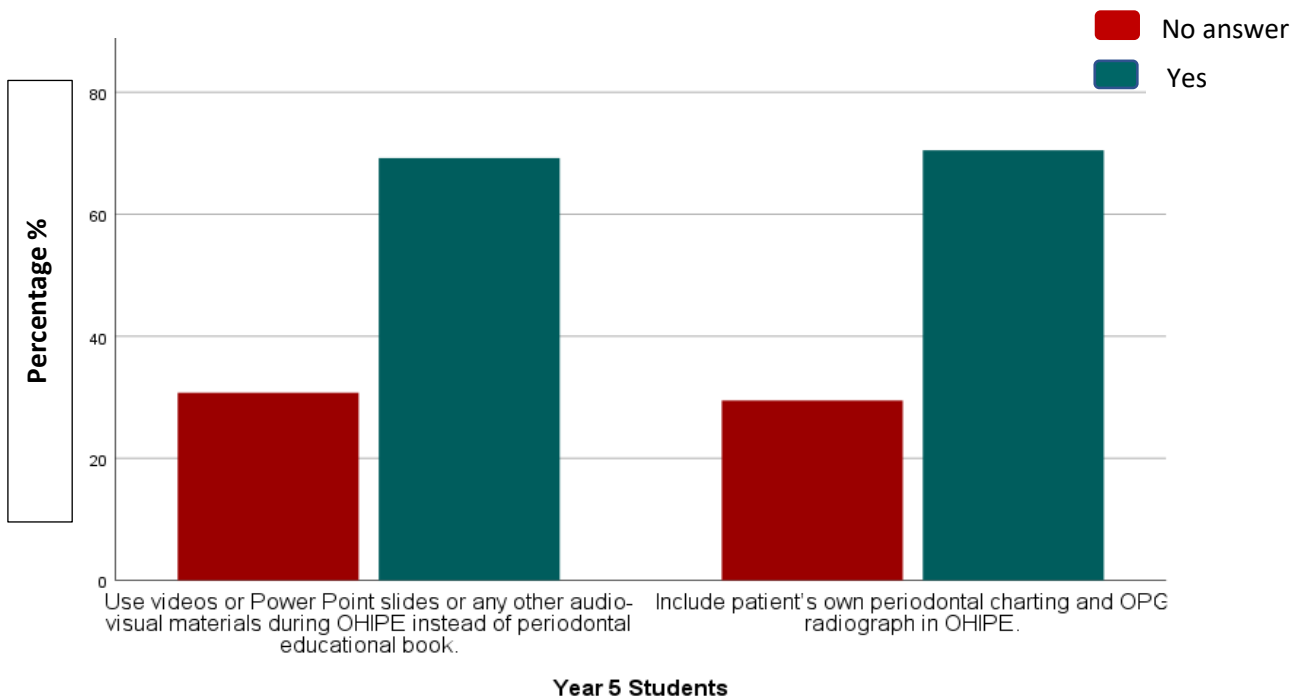**Figure 1 – Opinions for improvement of OHIPE among Year 4 students**

Figure 2 - Opinions for improvement of OHIPE among Year 5 students

DISCUSSION

Patient's home oral hygiene maintenance is an important factor to ensure good outcome of a periodontal treatment. The accumulation of dental plaque and calculus is usually caused by improper toothbrushing techniques, failure to carry out interdental cleaning and irregular dental visits (Lertpimonchai, A et al, 2017). It is important for the periodontal patients to be taught how to perform plaque removal efficiently. Dental students are the future oral health providers. In order to motivate their patients regarding OHIPE, they themselves should be well-informed and equipped with correct oral hygiene instructions and periodontal knowledge. Their OHIPE to periodontal patients should be tailored to patient's need, thus the protocol for OHIPE should include informing patients regarding know their current periodontal status, which often neglected by most students. The reinforcement involved mandatory incorporation of patient's complete periodontal chart and radiograph and these two items should be presented during OHIPE to patients. The advantage of using a periodontal chart is that the students are able to point out areas that are concerning and require more attention during oral hygiene practice by the patient. This may help the patient to better appreciate the OHIPE given by the operator. The demo on proper OHIPE has been given during preclinical exercises among year 4 students during their year 3.

Our data analysis showed that year 4 students recorded lower percentage of knowledge on OHIPE as compared to year 5 students. These results could be due the number of clinical sessions for year 4 students was greatly reduced due to the Covid-19 pandemic that occurred during the period of this study. Students were not able to carry on with clinical sessions during those unprecedent times. This costed the students time to manage their patients, hence less clinical experience.

Results of this survey also showed that only half of year 4 students understand that oral hygiene instructions should be tailored to the periodontal patient's own needs especially related to their risk factors and not general information to all patients. Thus, protocol of the OHIPE should be strengthen further with more preclinical and simulation exercises such as 'role-play' incorporated in the undergraduate curriculum. This is also important to reinforce student's communication skill prior to clinical sessions. As periodontal disease is categorized as a multifactorial disease, periodontal patients may be presented with risk factors that could affect the periodontal management such as diabetes mellitus, smoking and other systemic disease may contribute to the disease, students are expected to be confidently educating patient with the relevant information.

Another interesting finding of this study is that students know the importance of interdental cleaning aids such as flossing and interdental brushes (IDB). Unfortunately, majority of year 4 and year 5 students failed to understand that IDB is best to be recommended and provided to the periodontal patient after removal of supragingival calculus. Giving the IDBs during OHIPE without evaluating the interdental spaces and correct sizes that is relevant to the patient will results in ineffective interdental cleaning. A few systemic reviews have evidently shown that that the adjunctive use of interdental brushes results in significant improvements on clinical parameters such as plaque scores, bleeding scores, and probing depth, when compared to brushing alone (Slot, DE, Dörfer, CE, & Van der Weijden, GA ,2008; Poklepovic PT.et al, 2019).

Both year 4 and year 5 students understand the importance of different sizes of interdental brushes and each patient may require more than one IDB size. In 2011, Imai et al. carried out a study regarding the best-fitting IDBs for interproximal sites in correlation to inflammation. The reduced number of bleeding sites noted in this study was attributed to the use of an appropriate size of interdental brush, and not one size fits for all proximal spaces (Imai, PH, & Hatzimanolakis, PC, 2011). With the plethora amount of IDB available in the market today, it is important for the operator to determine and advise the patient on the IDB size and not the patient to decide based on their liking. Therefore, the oral hygiene instructions given to the patient by the dental student would be more effective when emphasised being given on the area that patient missed during daily plaque control regime.

The final section of this study was dedicated to opinions and suggestions from the participants for improvement or for any additional criteria for OHIPE to be more effective. Majority of the students voted for usage of audio-visual materials during OHIPE to attract patient's attention and to enhance patient's understanding. Another helpful tool would be patient's own model, however none of the participants suggested this idea.

This cross-sectional study may have a few limitations when conducted. This research was conducted based on self-report data; thus, participants may have made errors in interpreting the questions. However, we do believe that the error may be minimal as the questionnaire has been validated prior to distribution. The study may also be restricted by the short period of time this study was carried out.

In the future, this study could be strengthened with evaluating the knowledge on periodontal health and plaque control techniques among periodontal patients that have been given OHIPE by the students. Other than that, the clinical parameters such as plaque score and bleeding score of the patients could also be included in order to assess the patient's adherence to plaque control regime as advised by the students.

CONCLUSION

As a conclusion, periodontal knowledge and perception regarding OHIPE among clinical years students in Faculty of Dentistry, UiTM is good. The year 4 students' knowledge and perception on OHIPE is lower than year 5 students' despite emphasis given on OHIPE due to limited clinical experience as most of the clinical sessions have to be postponed during their fourth year due to Covid-19 pandemic in 2020. The protocol of OHIPE during preclinical and clinical sessions need to be strengthened.

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CONFLICT OF INTEREST

The author(s) declare no potential conflicts of interest.

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