The Relationship between Oral Health Attitude (HU-DBI) Score and Caries Experience (DMFT) Score among First Year Dental Students in USIM, Malaysia.

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Abstract

Oral health attitude and behaviours are important indicators of a person's oral health status. Measuring caries experience is one of the assessments to investigate overall oral health status. Our study aimed to determine the relationship between oral health attitude and caries experience in a group of first year dental students in Faculty of Dentistry, USIM, Malaysia.

The hypothesis was the higher HU-DBI score of a person, the lower their DMFT score. All 35 newly registered first year dental students were examined clinically, and their caries status was measured using the DMFT score, a standard index used to measure caries experience with lower score indicates low caries experience. Hiroshima University - Dental Behaviour Inventory (HU-DBI) questionnaire in English version was used to measure their oral health attitude. Twelve items were selected and scored, with one point given for each agree/ disagree answer given. Higher scores indicate better oral health attitude and behaviour, with maximum score of 12. Data were statistically analysed using SPSS ver. 17. Pearson correlation were used to analyse the strength of linear relationship between oral health attitude (HU-DBI score) and caries experience (DMFT score).

There was no significant correlation between oral health attitude and caries experience ($r = -0.022$, p value =0.9). However, the correlation coefficient showed a negative trend, possibly indicating an inverse relationship between the two variables.

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Introduction

An individual's attitude towards health is one of the determinants in theories of behaviour change [1]. Having the right attitude is an important antecedent in ensuring the health-promoting behaviours desired can be achieved, hence resulting with improved health status of the person.

Health behaviour can be defined as "...overt behaviour patterns, actions and habits that relate to health maintenance, to health restoration and to health improvement..."[2]. It is also synonymously referred to as 'health-related behaviour' considering the basis that these behaviours could influence individual's health status. Among the important health-related behaviours that is relevant to oral health status is having a good oral hygiene practice specifically toothbrushing habit[3]. A good toothbrushing habit with fluoridated toothpaste has been proven to prevent caries formation[4] and good plaque control regime is beneficial in reducing risk of periodontal disease[5]. Adopting health-promoting behaviours is pivotal in maintaining and achieving good health.

Several studies have shown that socio-economic factor influences oral health behaviours and attitudes[3,6,7]. One study looked into gender-specific oral health attitudes and behaviours comparing men and women [8] while another study made comparison in oral health attitudes between dental students in Britain and China [9]. From the literature, there was a minimal number of research papers written about relationship between oral health attitude and caries experience. Only one study investigated

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the relationship between dental caries status and oral health attitudes among young adults[10].

Dental caries is a multifactorial aetiology disease. It occurs when the process of demineralisation outweighs remineralisation around the tooth surface[11]. Dental caries has been classified as one of the burdens of disease faced globally that remain prevalent albeit presence of available preventive methods. When all risk factors present concurrently which are teeth, bacteria, sugar and time, demineralisation begins.Sufficient exposure to fluoride has been recognised in studies as a protective factor for caries[4]. Toothbrushing with fluoridated toothpaste is one of the reasons for caries decline in the recent years and has been proven to be effective in preventing caries[4].

Hiroshima University-Dental Behaviour Inventory (HU-DBI) is a set of 20 items of dichotomous questions of agree/disagree that was developed by Kawamura (1988) to assess oral health attitudes and behaviours, especially the toothbrushing habit[12]. It has been used worldwide and translated into several main languages. The maximum score is 12 from twelve selected items with the higher score achieved indicated as having better oral health attitude. DMFT index has been the clinical and epidemiological index to measure caries experience and severity [13]. Although the limitations of DMFT score is well understood, it is by far still being used around the globe as the standard index in recording dental caries experience[14].

This study aimed at looking at the relationship between oral health attitude or behaviour of a person with their caries experience. Are those with better oral health attitudes or behaviours present with lower caries experience, which means they have less decayed and filled teeth? The hypothesis of this study is that the better oral health attitude of a person, the lower caries experience they should have indicating better oral health condition.

Materials and methods

The study recruited 35 newly registered first year students from Faculty of Dentistry, Universiti Sains Islam Malaysia (USIM) as the subject. During the first week after registering as dental student, dental examinations were performed by two clinical lecturers which includes charting of all the subjects' teeth. Dental caries status of each subjects was recorded and measured using the DMFT score, with D=decayed, M=missing due to caries, F=filled tooth due to caries. Lower DMFT score indicates lower caries experience and severity. Within the same week, modified English version of HU-DBI questionnaire were distributed to all 35 subjects in their lecture room. The subjects were allowed to ask if they have problem in understanding the questionnaire. The subjects were required to fill in their student's identification number (ID no), age, gender and date in their form. HU-DBI scores were then counted from the twelve selected items out of twenty questions. For calculation of the HU-DBI score, one point is given for each agree responses from items marked (A) and one point will be given for each disagree responses from items marked (D). The modified English version of HU-DBI questionnaire was based from previous research by Kawamura *et. al* (2000) [15] and the scoring system was based from Kawamura *et al.,* (1993)[16].

Items number and descriptions
1. I don't worry much about visiting the dentist.
2. My gums tend to bleed when I brush my teeth. (D)
3. I worry about the colour of my teeth.
4. I have noticed some white sticky deposits on my teeth.(A)
5. I use a child-sized toothbrush.
6. I think I cannot help having false teeth/dentures when I am old.(D)
7. I am bothered by the colour of my gums.
8. I think my teeth are getting worse despite my daily brushing.(D)
9. I brush each of my teeth carefully.(A)
10. I have never been taught professionally how to brush.(D)
11. I think I can clean my teeth well without using toothpaste.(A)
12. I often check my teeth in a mirror after brushing.(A)
13. I worry about having bad breath.
14. It is impossible to prevent gum disease with toothbrushing alone.(D)
15. I put off going to the dentist until I have toothache.(D)
16. I have used a dye to see how clean my teeth are.(A)
17. I use toothbrush which has hard bristles.
18. I don't feel I've brushed well unless I brush with strong strokes.
19. I feel I sometimes take too much time to brush my teeth.(A)
20. I have had my dentist tell me that I brush very well.

Table 1. Modified English version of HU-DBI questionnaire form.

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The independent variable is HU-DBI scores, and the outcome variable is DMFT scores. The data were then tabulated and analysed using Pearson correlation in SPSS version 17.0. Correlation test were used to analyse the strength of relationship between the two variables. Significance level was decided at *p* value < 0.05.

Results

All 35 subjects aged 19 years old. All of them are from Malay ethnicity with 11 males (31.4%) and 24 females (68.6%). Figure 1 showed the distribution of DMFT score attained by the subjects. Out of 35 subjects, 12 (34.3%) of them have a score of 0 indicating caries free (zero caries experience). DMFT score ranged from score 0 to 9 (mean = 2.49, SD= 2.76).

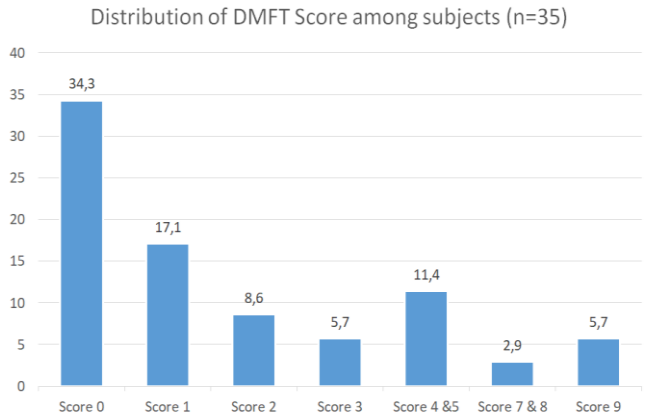

Figure 1. Distribution of DMFT score among subjects (n=35).

(Figure 1: Distribution of DMFT score among subjects (n=35))

Table 2 showed the distribution of HU-DBI score among the subjects. The HU-DBI score ranged between score 3 to 9 (mean=5.97, SD= 1.71) with only 2 persons (5.7%) having the highest score that is 9 (maximum score is 12).

(Table 2: Distribution of HU-DBI score among subjects (n=35))

To test the strength of relationship between oral health attitude (HU-DBI score) and caries experience (DMFT score), Pearson correlation were used. Correlation coefficient (r) is -0.022 with *p* value more than 0.05 (0.9), indicating no significant correlation between HU-DBI score and DMFT score.

Total HU-DBI Score	Frequency	Percentage (%)
3	4	11.4
4	2	5.7
5	8	22.9
6	8	22.9
7	5	14.3
8	6	17.1
9	2	5.7
Total	**35**	**100.0**

Table 2. Distribution of HU-DBI score among subjects (n=35).

Discussion

This study focuses on oral health behaviour and caries experience of a person, whether there is a significant relationship between the two variables. However, the correlation analysis revealed no significant relationship between the two variables (r= -0.022; p= 0.900). The correlation coefficient (r) did show a negative trend, possibly indicating that when the value of one variable goes up, the other variable's value will go down.

We hypothesized that with an increase in HU-DBI score which means better oral health attitude and behaviour, the dental caries status should be lower or decreased. We expected to see the same result as Levin *et. al* [10] who did an almost similar study among 123 young Israeli adults. Their study revealed findings which showed that among participants who presented with low levels of dental disease, they also happen to have a more positive oral health attitude and behaviour.

There are studies that have assessed oral health attitude and behaviour using HU-DBI questionnaire. [16] There was a study that investigated relationship between oral health behaviour (HU-DBI score) and periodontal health (CPITN score) among 571 adults in Japan. Their study revealed significant findings with negative

linear relationship between the two variables. HU-DBI also was used as a tool to assess cross-cultural differences in oral health behaviour among countries, as shown by studies among Finnish, Japanese, West China, Bangalore and Britain dental students [9, 15, 17, 18]. Varied findings in the HU-DBI score among the countries were seen, which provide interesting comparative data in regard to oral health attitude of dental students coming from different culture, schools and health care systems.

One study looked at differences in oral health attitude comparing dental and medical students in United Arab Emirates [19] and another study compared differences in oral health attitude between dental and engineering students in Colombia [20]. From these studies, the dental students present with better HU-DBI score as compared to students from different study field. This could be due to the dental curricula that provided them with continuous reinforcement on oral care.

There was some limitation in this study. Firstly, is the number of subjects involved that is only 35 students. The reason to the small numbers was because that is the total number of first year students recruited each year by Faculty of Dentistry, Universiti Sains Islam Malaysia (USIM). With quite a small number of subjects involved, the accuracy of results obtained appeared questionable. The scatter plot produced to analyse correlation between HU-DBI score and DMFT score become almost pointless. Due to this, simple linear regression is not possible to be tested which could further analyse the linearity of the relationship between the two variables.

The correlation test revealed a very weak negative linear correlation (r= -0.022), a far cry from sizable strength of the correlation coefficient, that is more than 0.3[21] as mentioned by Chinna [22]. This again, could be possibly due to the small number of subjects involved. Nevertheless, the inverse relationship shown between the variables tested somehow hint the existence of possible association between HU-DBI score and caries experience. Those with higher score in HU-DBI which means better oral health attitudes at the same time presented with low DMFT score which indicate low caries experience.

DMFT is the index that has been used and accepted globally as epidemiological tool to record caries experience [11, 13]. DMFT index is used to score how severe a person's caries experience by totalling the number of decayed teeth, missing due to caries and filled teeth at one particular time. Basically, DMFT records the consequences of having dental caries [23]. Despite being the epidemiological tool of choice by WHO as a standard measurement for caries, the limitation of DMFT are well-known and have been discussed by several authors [14, 24].Benigeri *et. al* (1998)[14] stated that among the limitation of DMFT index in determining caries experience is the fact that it considers all missing teeth as being extracted due to caries, unless the patient were informed earlier such as for orthodontic reason. Another point is that DMFT index give equivalent level of importance to decayed teeth and a filled tooth, hence diminishing the benefit of restored teeth as the value given is the same as decayed teeth. Furthermore, those who have attended dentist for preventive treatment obviously will have higher number of teeth being restored compared to those who have never or seldomly visit dentist. The person could possess good oral health attitudes and have a DMFT score of 7 that was due to multiple fillings on his teeth done few years back. Somehow, this gives an inaccurate picture of the actual dental status of the person. Having high number of DMFT score does not mean that the person's oral health status is currently poor or having a less favourable oral health attitude.

For future research, we hope to investigate the relationship between oral health behaviour with oral hygiene status. Oral Hygiene Index-Simplified (OHIS) by Greene & Vermillion (1964)[25] can be used as the measurement tool to assess oral hygiene, which requires scoring the level of dental plaque and calculus presence in the mouth according to the score given. This perhaps, would be more suitable and relevant as compared to assessing caries experience to relate with a person's current oral health attitude. It is also recommended to further expand the research to look at differences in oral health attitude among dental students before and after receiving dental health education during their undergraduate years.

Conclusions

The present study showed no significant correlation between oral health attitude (HU-DBI score) and DMFT score (caries experience)

among first year dental students in USIM. However, there was possibly an inverse relationship between the two variables. Having better oral health attitude, indicated with higher HU-DBI score could possibly mean these people also present with lower DMFT score, which means less caries experience.

Declaration of Interest

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