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RESEARCH ARTICLE

The relationship between dental caries status and oral health attitudes and behavior in USM undergraduate's dental students.

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Abstract

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Oral health behavior of dental students and their attitudes reflect their understanding of the importance of preventive dental procedures of their patients. The aim of this study was to investigate the relationship between oral health attitudes and behavior as measured by the Hiroshima university-dental behavioral inventory (HU-DBI) and dental caries status using the DMFT of undergraduates' dental students of USM. This is a cross-sectional study include 181 students and participation was selected using systematic random sampling. The HU-DBI questionnaires (in english) were distributed (n=181) and all participants were submitted for clinical examination. Dental caries status was evaluated using the who caries diagnostic criteria for decayed, missing, and filled teeth (dmft). Data were statistically analyzed using ibm SPSS 20.0. Data of dmft values to the hu-dbi score were analyzed using mann whitney. There were 41 students (22.65 percent) caries free (dmf=0). Dmft score ranged from 0-17 (average 3.77). a statistically significant relation was found between 13 items and dmft scores or their components and indices. The HU-DBI score ranged from 0 to 11 (mean 7.50, sd=2.06). Low dt values significantly correlated with a high total HU-DBI score ($p < 0.05$); that is, subjects with low levels of dental disease had more positive oral health attitudes and behavior. In undergraduate dental student, dental disease, as measured by DMF scores was related to HU-DBI, which demonstrates the relationship of dental caries status with oral health behavior. Special emphasis on oral health education should be given to improving dental students' oral health attitudes and behavior.

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Introduction: -

Most promotions for oral health concentrate on regular routine dental examinations. Dentists are mainly concerned with the treatment of oral diseases rather than prevention of diseases or promotion of oral health. To date, information is limited regarding the public's knowledge and attitude about oral diseases and their prevention.

Several studies have focused on clinically diagnosing plaque and caries as indicators of appropriate oral health behavior. From the behavioral point of view, the more important objective is the health behavior itself, how tooth brushing relates to the individual's lifestyle, and what factors influence an individual's ability to perform these health behaviors (Tedesco et al., 1991; Wardle et al., 1991). Several recent studies concern the oral health attitudes and behaviors of young adults and the relation between their attitudes and behaviors and their dental or oral status (Kawamura et al., 1993; Honkala, 1995).

Oliveira et al. (2000) children with inadequate oral health knowledge are twice as likely to have caries than children with adequate knowledge. Parental beliefs and attitudes also play a key role in moderating oral health-related behavior in young children and in determining whether they develop caries (pine et al., 2004). Additionally, school-based oral health education programs were recently reported to have a positive effect on gingival bleeding score and

oral health behavior of children (Petersen, et al., 2001; Nishi et al., 2015). Oral wellbeing and common wellness reputation rely on a dynamic interplay of many causes, together with the character's private characteristics, behaviors, and perceptions (Atchison et al., 2003; Khan et al., 2016).

Dental health is a highly individualized concept, the perception of which is very much affected by an individual's culture and economical status. The attitude of people towards their own teeth, and the attitude of the dentists who provide dental care, play an important role in determining the oral health condition of the population (Rushabh *et al.*, 2008). By choosing a dental curriculum at the undergraduate level, dental students become a model for oral health (Frazier *et al.*, 1983). Dentist occupy an important position in society as licensed health care workers, therefore ideally, dental students should be a good example of positive oral health attitudes and behavior to their families, patients, and friends.

It's commonly approved that self-report is a less than perfect predictor of habits. While somewhat remote, medical indices for physical signs of compliance have limitations as good. For this reason, probably the most adequate comparison entails both self-report and clinical indices.

The Hiroshima university-dental behavioral stock (HU-DBI) questionnaire, developed by means of Kawamura (1988), contains twenty items specially associated with teeth-brushing habits. All items have a dichotomous response format (agree/disagree). A quantitative estimate of oral wellness angle and behavior is offered by the complete correct agree/disagree responses. The maximum viable score is 12. Better ratings indicate better oral wellbeing attitude and behavior (Kawamura et al., 1993) the score of every item, which relates to oral wellbeing perspective and habits in the HU-DBI, used to be based on analytical research, where a statistical model was developed. Differences in oral wellness habits can also be measured with this questionnaire. (Kawamura et al., 1993, 1992; Kawabata et al., 1990).

In a sample of 517 Japanese university students, the HU-DBI had good test-retest reliability (0.73) over a four-week period (Kawabata *et al.*, 1990). The English version has also shown good test-retest reliability and translation validity in a sample of twenty-six bilingual individuals (Kawamura *et al.*, 1992). This English version was also translated into Malay (bilingual).

The sector wellbeing institution (WHO) carries diagnostic criteria for decayed, lacking, and stuffed enamel and surfaces (DMFT and DMFs, respectively) are the simplest and most in most cases utilized in epidemiologic surveys of dental caries, since they quantify dental wellbeing reputation centered on the number of carious, missing, and filled tooth and enamel surfaces (WHO, 1997).

The purpose of our study was to investigate the relationship between oral health attitudes and behavior as measured by the HU-DBI and dental caries status using the DMFT in a sample of USM Dental students. Our hypothesis was that there is a relationship between dental status and oral health behavior.

Material and method: -

Human ethic committee of Universiti Sains Malaysia (USM) approved this study. This cross-sectional study conducted on 181 students who are selected from USM dental school that volunteer to be part of this study. The sample was selected using systematic random sampling and the written consent had been obtained from all patients. The inclusion criteria for subjects include: they should be an under-graduate's dental student in the academic session of 2012/2013. The exclusion criteria for the study subject include: not an undergraduates USM dental student.

Table 1:- Total number of subjects divided according years

Students'Year	Frequency	Percent	Valid percent	Cumulative percent
First	31	17.1	17.1	17.1
Second	37	20.4	20.4	37.6
Third	25	13.8	13.8	51.4
Fourth	42	23.2	23.2	74.6
Fifth	46	25.4	25.4	100.0
Total	181	100.0	100.0	

Table 2:- DMF score, their components and indices

Indices	Mean	Sd	Range
Dt	1.36	2.033	0-10
M	0.08	0.378	0-4
Ft	2.33	2.733	0-14
Dmft	3.77	3.706	0-17
D/dmf index	27.59%	36.65%	0-100
F/dmf index	48.67%	42.75%	0-100

Dental examination had been carried out in HUSM dental clinics for all subjects. Dental caries experience was measured using the decayed, missing and filled teeth index (dmft) according to the who caries diagnostic criteria. Oral examination using a plain mouth mirror and standard probe was performed without radiograph assessment. Data were analyzed using spss version 20. Quantitative variables, dmft, ft, dt, will be express as the mean. Qualitative variables will be reported as categorical data. The mann whitney test are used since the result were not normally distributed, accepting statistical significant for $p < 0.05$. Correlation between variables was examined using the spearman correlation test for without normal distribution.

Ethical consideration:-

Ethical consideration is obtain from the human research & ethics committee of USM (USMKK/ppp/jepem[267.3.(1.8)]). All information will keep confidential and only accessible by researchers, and only group information reported, and published.

Result:-

The dental disease index dmft score ranged from 0 to 17 (average 1.36). There were 41 participants (22.7 percent) who were caries-free (dmf=0). More than half (one hundred patients, 55.2 percent) had no caries decay at the time of examination (d=0). Untreated dental caries mean scores were 1.36 (dt). Dental treatment as shown by the treatment component of total caries experience, calculated by the f/dmf index, averaged 48.67 percent, whereas the decay component, which represents the untreated dental disease, calculated by the d/dmf index, averaged 27.59 percent. The dmft scores, their components, and indices are shown in table 2.

Hu-dbi questionnaire items and percentage of agree/disagree responses are presented in table 3. Only 5 percent of the participants reported that they use child-size toothbrush, 8.8 percent answered that their teeth getting worse despite of daily brushing, 89.5 percent participant replied that they brush each of their teeth carefully. Only 10 percent never been taught professionally on tooth brushing and 3 percent of participants think that they able to clean their teeth well without using toothpaste.

Table 3:- hu-dbi questionnaire items and percentage of agree/disagree responses

Hu-dbi questionnaire items and percentage of agree/disagree responses					
Item number and description		Agree		Disagree	
		No.	%	No.	%
1.	I don't worry much about visiting the dentist.	141	77.9	40	22.1
2.	My gums tend to bleed when i brush my teeth. ^d	36	19.9	145	80.1
3.	I worry about the color of my teeth.	110	60.8	71	39.2
4.	I have noticed some white sticky deposits on my teeth. ^a	57	31.5	124	68.5
5.	I use a child-sized toothbrush.	9	5	172	95
6.	I think that i cannot help having false teeth when i am old. ^d	51	28.2	130	71.8
7.	I am bothered by the color of my gums.	54	29.8	127	70.2
8.	I think my teeth are getting worse despite my daily brushing. ^d	16	8.8	165	91.2
9.	I brush each of my teeth carefully. ^a	162	89.5	19	10.5
10.	I have never been taught professionally how to brush. ^d	10	5.5	171	94.5
11.	I think i can clean my teeth well without using toothpaste. ^a	3	1.7	178	98.3
12.	I often check my teeth in a mirror after brushing. ^a	157	86.7	24	13.3
13.	I worry about having bad breath.	122	67.4	59	32.6
14.	It is impossible to prevent gum disease with toothbrushing alone. ^d	109	60.2	72	39.8
15.	I put off going to the dentist until i have toothache. ^d	36	19.9	145	80.1
16.	I have used a dye to see how clean my teeth are. ^a	82	45.3	99	54.7
17.	I use a toothbrush with hard bristles.	4	2.2	177	97.8
18.	I don't feel i've brushed well unless i brush with strong strokes.	29	16	152	84
19.	I feel i sometimes take too much time to brush my teeth. ^a	69	38.1	112	61.9
20.	I have had my dentist tell me that i brush very well	84	46.4	97	53.6
In calculation of the hu-dbi:					
^A = one point is given for each agreed response;					
^D = one point is given for each disagreed response.					

Table 3 shows the mean DMF scores and their d and f components in relation to agreement/disagreement to the hu-dbi items. When relating different dental diseases, dmf values, to the hu-dbi responses, a statistically significant relation was found between thirteen items and dmf scores or their components and indices ($p < 0.05$), presented in table 4.

Table 4:-mean DMF scores and their d and f component in relation to the agreement/disagreement to HU-DBI item

Mean dmft scores and their d and f component in relation to the agreement/disagreement to hu-dbi item				
Item	Response	Mean dmft	Mean dt	Mean ft
1	Agree	3.723	1.142	2.511
	Disagree	3.950	2.125	1.700
2	Agree	5.750*	2.556*	3.056
	Disagree	3.283*	1.062*	2.152
3	Agree	3.482	1.046	2.382
	Disagree	4.225	1.845	2.254
4	Agree	2.947	0.877	2.018
	Disagree	4.153	1.581	2.476
5	Agree	4.444	1.111	3.222
	Disagree	3.738	1.372	2.285
6	Agree	5.373*	2.471*	2.686
	Disagree	3.146*	0.923*	2.192
7	Agree	4.722	1.982*	2.630
	Disagree	3.370	1.095*	2.205
8	Agree	8.188*	5.000*	2.938
	Disagree	3.346*	1.006*	2.273
9	Agree	3.512*	1.216	2.241
	Disagree	6.000*	2.579	3.105
10	Agree	6.800*	3.900*	2.500
	Disagree	3.597*	1.211*	2.322
11	Agree	5.333	1.667	3.333
	Disagree	3.747	1.354	2.315
12	Agree	3.242*	1.236*	1.968*
	Disagree	7.250*	2.167*	4.708*
13	Agree	3.582	1.353	2.197
	Disagree	4.170	1.373	2.610
14	Agree	4.413*	1.697	2.606
	Disagree	2.806*	0.847	1.917
15	Agree	4.333	2.667*	1.556*
	Disagree	3.635	1.035*	2.524*
16	Agree	3.402	1.134	2.195
	Disagree	4.081	1.546	2.444
17	Agree	11.500*	6.000*	4.500
	Disagree	3.599*	1.254*	2.283
18	Agree	5.793*	2.310*	3.241*
	Disagree	3.388*	1.178*	2.158*
19	Agree	2.638*	1.015*	1.594*
	Disagree	4.473*	1.571*	2.786*
20	Agree	2.738*	0.893*	1.774*
	Disagree	4.670*	1.763*	2.814*

*bold = $p < 0.05$, using mann whitney test**Discussion:-**

An important task of oral health professionals and students are to instill in their patients correct oral habits to prevent oral diseases. The first step in establishing a habit is to provide relevant knowledge to the patients and to raise their awareness of how to prevent oral diseases. As a dental student it is vital to have this knowledge and awareness before explaining to patient when they start working as a dental professional later on.

Dental scholars should be a just right illustration of positive oral wellness attitudes and behavior to their households, patients and friends. Typically, they have been found to be encouraged about keeping an excellent oral health. Oral health behavior and attitudes amongst oral wellbeing staff and pupils have been evaluated by using utilizing hu-dbi

survey international in a number of experiences, (Nusair et al., 2006; Kawamura, 1988; Polychronopoulou et al., 2002), which have been carried out in exceptional countries. Even, cultural variations in nations with similar or distinctive social techniques were investigated in prior experiences (Kawamura et al., 2002; Kawamura et al., 2000; Polychronopoulou et al., 2002). Dental surveys of undergraduate's dental student are perfect for the dental reputes of a future function model in dental wellness and as a young Malaysian adult.

DMF indices, the easiest and most on the whole utilized in surveys of dental caries, do not measure ailment but measure oral health gurus' conduct and treatment thresholds, which might be, in flip, related to disease phases. This is above all major, as excessive f accessories, which resemble handled dental disorder, were it appears associated with some suggested behaviors in us be taught.

Gender was not an essential aspect influencing the HU-DBI percentage of agree/disagree responses. This finding is steady with a prior survey with the aid of Kawamura (1988), wherein dental wellbeing advantage, perspective, and habits amongst eastern employees were assessed.

It is problematic to assess knowledge with transient devices, such because the one adopted here, and draw company distinctions from attitudes and beliefs. Traditionally, research in wellbeing education is situated on the assumption that abilities is absolute. Nonetheless, talents regarding the involvement of behaviors in disorder is seldom exact, and there is disagreement even amongst professionals concerning the relative importance of exclusive motives. There can be a bias toward endorsing objects below stipulations of uncertainty, leading to inflated optimistic responses.

The mean HU-DBI score used to be bigger in our study than beforehand said via Kawamura et al. (1993) among jap adults. One implication of our findings is that oral wellness attitudes and behavior, at the least in this pattern, appear to foretell the contributors' specific oral well being status. Emphasis will have to accordingly be placed on instructing sufferers receiving dental medication to reinforce their oral health attitudes and behavior. Not too long ago, there was an expanded tendency to deal with youngsters and youth by using licensed pediatric dentists, rather than through dental basic practitioners (Venezie et al., 1997). A important goal of the specialization is to raise the advantage and awareness needed to avoid oral diseases.

Indices on dental attitudes and behavior aren't invariably evaluated with respect to reliability and validity regardless of their ordinary use. In our study, DMF would be regarded as a criterion outside to the hu- dbi to estimate its validity. Since the present new recommendations of the who for caries detection don't advise making use of a sharp sickle explorer, there could in all probability be a moderate broaden in false-optimistic findings in our gain knowledge of protocol. However, lots of the prior studies have used the equal protocol, so comparison of the results remains to be imperative.

In our study, there is a relationship between HU-DBI score and DMFT score. For example, responses that agreed to "My gums tend to bleed when I brush my teeth" (Item 2) relate with high DMFT and DT score, which indicates poor oral health and hygiene that lead to gingival signs (bleeding) and increase in caries/decay.

Agreement with the statement "I think that I cannot help having false teeth when I am old" (Item 6) was strongly related to high DT scores (untreated dental disease) ($P<0.01$) as well as to high DMFT score ($P<0.01$). Besides that, there was a statistically strong relation between agreement with the statement "My gums tend to bleed when I brush my teeth" (Item 8) and high DMFT and DT scores ($P<0.01$) was found. High D scores were also strongly related to agreement with the statement "I have never been taught professionally how to brush" (Item 10) with ($P<0.01$). Agreement with item "I often check my teeth in a mirror after brushing" (Item 12) was also strongly related to DMFT indices ($P<0.01$). Item 12 were found that subjects that agreed to be related to low DMFT, DT and FT. Awareness of importance of oral health is present and thus they do not require treatment.

A statistically strong relation was found between agreements with the statements "I put off going to the dentist until I have toothache." (Item 15) and high DT score was noted too ($P<0.01$). A statistically significant was found between items "I feel I sometimes take too much time to brush my teeth." (Item 19) and the statement "I have had my dentist tell me that I brush very well" (Item 20) with high DMFT scores ($P<0.01$).

Other statistically significant statement such as “My gums tend to bleed when I brush my teeth.” (Item 2), “I am bothered by the color of my gums” (Item 7), “I brush each of my teeth carefully” (Item 9). It is impossible to prevent gum disease with tooth brushing alone (Item 14) were found to related to high DMFT score. Lastly the statement: “I have had my dentist tell me that I brush very well” (Item 20) seem to be related to low DMFT, DT and FT.

Patient who is disagreed with item 17 (“I use toothbrush with hard bristles”) had low DMFT score. Plus, subjects that disagreed with statement item 18 (“I don’t feel I’ve brush well unless I brush with strong stroke”) have lower DMFT and DT score and lower FT score compare to people who agreed. This may indicate they have the knowledge to maintain good oral hygiene where softer bristles and correct technique of tooth brushing is better than hard bristles and strong stroke alone. Thus, this group has lower tendency of tooth to be filled.

In our study, nearly most of our respondents has been taught professionally on how to brush their teeth (Item 10), and nearly most of our respondent disagree with that they can brush without toothpaste (Item 11). This is not surprising as our subjects is dental student collected from year 1 until year 5 which educated with oral hygiene maintenance as one of their syllabus. This statement relates with low DT value of item 10. However, there are some that responded vice versa than what is expected. Thus, it is necessary for reinforcement of this matter to recognize the significance and importance of preventive activities.

The total HU-DBI score ranged from 0 to 11 (mean=7.5, SD=2.0). A statistically significant correlation was found between low DT values and a high total HU-DBI score ($P<0.05$). That is, participants with low levels of dental disease had more positive oral health attitudes and behavior.

In our study, which incorporate younger Malaysian adult that learning to be a dental reputable. The imply HU-DBI ranking of our gain knowledge of used to be bigger than earlier reports mentioned through Liran et al. (2004) and Kawamura (1988) that comprise study amongst their respective native young adults.

The rather small pattern size on this be taught resulted in a small subsample of the group studied. Hence, additional research using a bigger cohort is warranted. Despite the fact that the fairly small staff demonstrated was a issue in our gain knowledge of, the results had been statistically gigantic. A different gain knowledge of with a higher workforce would reveal improved relation.

Conclusion:-

In undergraduate dental student, dental disease, as measured by DMF scores was related to HU-DBI, which demonstrates the relationship of dental caries status with oral health behavior. The total HU-DBI score correlated to low D values; in other words, participants with low levels of dental disease had more positive oral health attitudes and behavior. These data demonstrate and reaffirm the relationship of dental status (represented by DMF) and oral health behavior (as measured using HU- DBI). Special emphasis on oral health education should be given to improving dental students’ oral health attitudes and behavior.

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