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ORAL HEALTH-KNOWLEDGE AND ATTITUDES AMONG MEDICAL, PARA-MEDICAL AND ENGINEERING STUDENTS

Dental Science

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KEYWORDS

INTRODUCTION

The condition of oral cavity is critical to health in general and good nutritional status in particular, conversely diet and nutritional factors play an important role in oral health and disease.[1] As we all know dental caries and periodontal disease are the most prevalent and chronic dental diseases, they are not life-threatening, but they have massive impact on quality of life, self-esteem of an individual and proper social functioning on nutrition and health of an individual.[2,3] Oral health information or dental knowledge is the most important prerequisite for health-related behavior and it is very important to raise the awareness of oral health knowledge to establish habits which are directed towards prevention of oral diseases.[4] There are many studies among dental students regarding oral health behavior, attitude and knowledge of oral and dental health care which conclude that oral health knowledge improved with increasing level of dental education and female students were better in their oral and dental health care.[5,6]

The medical practitioners form a very important part of the society and they are consulted more frequently than the dentists. Hence medical practitioners are expected to have a sound oral health knowledge in order to provide accurate information and guidance to their patients. A few studies also show that there is lower knowledge than expected amongst students studying in medical and engineering courses[7,] and care givers.[8] Hence considering the paucity of studies related to assessing oral health knowledge and dental attitude amongst students studying in medical, engineering and paramedical courses, this study was important and was undertaken.

MATERIALS AND METHODS

A total of 266 professional students were considered for the study in which 84 Medical, 82 Para-Medical (which included Pharmacy, Nursing and Physiotherapy students) and 100 Engineering students were included, and students in each profession were selected randomly. The participants were of the age between 18-22 years. In the present study there were 159 (59.8%) female participants and 107 (40.2%) male participants. An explanation was given about the objectives of study and subjects were invited to participate in the study. The questions in the questionnaire were mainly directed towards assessing the oral health knowledge of the participants which were mainly related to importance of oral hygiene measures, diet patterns, their knowledge regarding most common oral conditions and whether participants were aware about sugar substitutes and pro-biotic food **(Table-I)**. Then the data analysis was statistically analyzed by using Tukeys multiple post hoc procedure, variable and non-variable ANOVA, t-test and t-test followed by a suitable multiple post-hoc procedure and Mann-Whitney u test. The level of significance was set at **$p < 0.05$.**

RESULTS

According to analysis of the data 82.33% knew that they brushed their teeth to avoid caries, gum diseases, halitosis and whiten their teeth, around 53% of the participants knew that habit of rinsing their mouth after having their meal was useful. 38% of girls and 20% boys gave a yes response **(Table- III)** and around 26% of the participants were undergoing regular dental check-up once in a year and knew its importance, 19% subjects visited dentist regularly whereas others visited dentist only when there was a problem. Around 52% of subjects had habit of brushing twice daily, and 9% had habit of flossing and about 53% of subjects knew that they were using fluoridated tooth paste. 48.5 % of participants knew that halitosis is caused by infected teeth, gum diseases and food we consume, and 34% of engineering students and 41% of total participants knew that dental erosion was also caused by carbonated beverages **(Table-II).** It was noticed from present study that only 19% of the participants knew that frequency of sugar intake was more important in causing dental caries than the quantity of sugars. Around 20% of participants knew that medicated syrups containing sugars caused dental caries. The 52% medical students were aware about sugar substitutes available in market whereas only about 31% of engineering and paramedical students knew about these sugar substitutes. Only 9% of engineering students and 30% of total participants were aware about Pro-Biotic food items present in market. From present study it was noticed that dental health knowledge was less among professional students. The results of t-test showed that male participants had significantly **(Table-IV)** lesser oral health knowledge compared to female participants ($p = 0.0206$). The pair wise comparision using Tukeys multiple post hoc procedure showed Engineering students had significantly lesser oral health knowledge **(Table-V)** when compared to Medical and Para-Medical students and it showed statistically significant difference (p-value $=0.0010$ with medical and p-value of 0.0063 with Para-Medical students), and no statistically significant difference was noticed between Medical and Para-Medical students ($p = 0.8857$).

DISCUSSION

Good nutrition is essential to the initial growth and development of oral tissues and to their continuous integrity through the life span. Nutritional factors are important to the growth, maintenance, and repair of oral tissues and structures. Diet refers to patterns of food intake or eating habits. Dietary patterns are critical factors to dental caries risk, more importantly dental problems can also radically affect eating habits, subsequently nutritional status.[1] During past two decades, many industrialized countries have experienced a dramatic decline in dental caries prevalence in children and adolescents.[9,10] The reason for the improved oral health are complex but may involve a more sensible approach to sugar consumption, improved oral hygiene practices, fluoridated toothpaste, topical fluoride application, effective use of oral health services and establishment of school-based preventive programs.[11-13] Age, gender and profession have an impact on dietary habits, oral health related behaviors; also oral health knowledge varies with the profession. This study is important as it considered three different professions of which two groups were related to the field of medicine but not to dentistry and one group which was not related to medicine at all. In our study we did not perform clinical examination for DMFT indices so findings of our study may not directly relate to dental health status of the participants.

The findings of our study confirmed that knowledge regarding oral

hygiene procedures mainly brushing twice a day, flossing and oral rinsing was carried out regularly by female participants than the male participants which was in accordance with the previous studies.[14,39] and moreover, female participants knew the advantages of regular oral hygiene measures.[39] More commonly girls have a positive self-care attitude for internal psychosocial reasons to improve their appearance and self esteem.[15,40] 82% of participants of our study knew that brushing is helpful in having oral cavity free of tooth decay, gum diseases and bad breath. Only around 53% of participants had habit of mouth rinsing after meals which was less.

A greater part of patients visited dentist only when there was complaint and visits for regular preventive follow-up were very low.[16] In Our results showed that only 19% visited dentist regularly where as around 80% visited dentist only when there was complaint. Again more number of female (14.3%) participants had visited dentist regularly than males (6.6%), around 21% of engineering and medical students were on regular visits where as only 14% of para-medical students visited dentist regularly. Oral hygiene related behavior showed that females show higher rates of regular brushing and flossing.[14,40]

Interestingly in an important finding of the present study it was observed that only 17.3% of participants knew that frequent sugar consumption is more important than quantity of sugar consumption only 13% of engineering, 19% of para-medical, 20% of medical students chose right option amongst which only 7.4% of boys and 11.5% of girls knew it. Around 62% of students had a habit of frequent snacking mostly probably because of their irregular breakfast, lunch and dinner patterns which might have resulted in frequent snacking during the day[17] of which 81.6% of boys and 77.5% of girls had this habit of frequent snacking or consumption of sweet drinks.[18,19]

The evidence shows that sugars are unquestionably the most important dietary factor and the most studied factor in the development of dental decay. The importance of frequency versus the total amount of sugars is difficult to evaluate as the two entities are hard to discriminate from each other. Although many human interventional studies have shown that frequency of sugar intake is an important etiological factor for caries development.[20,21] It is sometimes stated that the cariogenicity of sugary food is related to its stickiness.[22] The longer it takes a food to clear the mouth the longer the drop in pH will remain; in our study around 53% of total participants and 70% of medical students were unaware of this important fact.

Dental erosion is the result of a loss of dental hard tissues etched away from the tooth surface by acid or chelating agents.[22] About 40% of respondents irrespective of specialty knew that dental erosion was caused by carbonated beverages. Dental erosion mainly originates from gastric, dietary or environmental sources.[23] Acidic foods and drinks (e.g. acidic fruits and vegetables, salad dressings, vinegar, alcoholic and non-alcoholic beverages, carbonated soft drinks herbal teas, fruit juices) have been considered as the main extrinsic sources of erosive agents.[24] As lifestyles have changed through the decades the total amount and frequency of consumption of acidic foods and drinks have also changed. Soft drink consumption in the USA increased by 300% in 20 years, [25] among our study population awareness about erosion and carbonated drinks was less.

The prevalence of halitosis has been reported to be as high as 50% [26] individuals who suffer from oral malodor often impact their personal life by attempting to mask their disease with mints, and chewing gums, compulsive brushing, and repeated use of mouthrinses.[27] Although causes of oral malodor are not entirely understood, most unpleasant odors are known to arise from food debris trapped in the mouth.[28] The problem of oral malodor has been shown to originate in the oral cavity, where conditions favor the retention of anaerobic bacteria like periodontal pockets and infection caused by dental caries. Regarding etiology of halitosis 61% of medical students and approximately 43% of engineering and para-medical students could correlate halitosis to the presence of infected carious teeth, periodontal diseases and some of the food items we consume. Xylitol is a sugar substitute with sweetness equal to that of table sugar (sucrose), but with 40% fewer calories.[29] It is a member of the sugar alcohol or polyol family, which includes other common dietary sweeteners such as sorbitol, mannitol and maltitol. These sugar alcohols have been shown to be non-cariogenic and their consumption does not promote tooth decay.[30] Furthermore, xylitol has been shown to have a protective effect and to reduce tooth decay in apart by reducing the levels of *Streptococcus mutans* in plaque and saliva and by reducing the levels of lactic acid produced by bacteria. Microorganisms do not readily metabolize xylitol into energy sources, and its consumption has a minimal effect on plaque pH.[31] the list of snack foods and dietary containing xylitol is rapidly expanding. The evidence is sufficient for clinicians to consider including xylitol containing products in their clinical armamentarium for the prevention of tooth decay[32,41] awareness about beneficial effects of sugar substitutes has to be increased amongst these adolescents.

Sucrose content of the pediatric liquid medicaments ranged from 0 to 70 gm/100 ml. These medicaments had definitive endogenous calcium dissolution potential.[33] Hence health practitioners should be aware of the sucrose content of pediatric medications. Patient education to ensure adequate oral clearance following each dose of medication is an essential first step in minimizing the risk of dental decay posed by long-term therapy with liquid medications.[34] This finding becomes important as our study group comprised of students studying medicine. Probiotics can be defined as living microbes, or as food ingredients containing living microbes, that beneficially influence the health of the host when used in adequate numbers.[35] Traditionally, probiotics have been associated with gut health, several investigators have also suggested probiotics for oral health purposes. The most commonly used probiotic bacterial strains belong to the genera *Lactobacillus* and *Bifidobacterium.*[36] In recent times, oral lactic acid bacteria and bifidobacteria have been isolated and characterized for various oral health purposes, including caries, periodontal diseases, and halitosis.[37] From the present study it was noticed that lack of knowledge of these students about probiotics and their useful effects on the oral cavity, especially among engineering students.

CONCLUSION

Following conclusions can be drawn from present study,

- Main outcome of our study was Medical and Para-Medical students had significantly higher oral health knowledge than the students studying engineering course.
- From present study it was also noticed that female participants studying in different professional courses had significantly higher oral health knowledge and practiced oral hygiene measures more regularly than boys.

Composition of diet and the frequency of consumption of diet are very important which contribute to cariogenicity of diet and also in affecting periodontal health. Considering the low levels of oral health knowledge among these students it is important to carry out programs to increase oral health knowledge among these professional students.

Table- 1: Questions related various aspects of Oral Health Knowledge.

Question Number	
1	Do you think that brushing teeth is important
2	Do you think that rinsing your mouth after every meal protects your teeth
3	Do you think you should visit Dentist once in a year
4	Do you think it is important to visit dentist on observing decayed teeth and bleeding gums
5	Do you have a habit of eating chocolates frequently
6	Reasons for bleeding gums?
7	Reasons for Oral Mal-odor?
8	Is there any correlation between the food we consume and occurrence of decay
9	Reason for development of tooth decay is mainly related to Frequency or quantity of sugar intake
10	Do you think that carbonated soft drinks you consume might cause the loss of tooth structure
11	Do you think eating or drinking in between meals affects your teeth and gums
12	Do you have habit of eating snacks before sleep affect your oral health
13	Do you feel that sticky food is more cariogenic
14	Do you think, health of the gums is related to the food you consume
15	Do you think the type of diet you consume affects your oral health
16	Do you think Bottle feeding in children can cause dental caries
17	Are you aware of the sugar substitutes

18	Do you know that Medicated syrups containing sugars and can cause tooth decay
19	Are you aware of the Pro-Biotic food products
20	Do you think that diet counseling is important to have good oral health

Table- 2: Percentage of students from the diverse professions whose oral health knowledge corresponded with the most appropriate response in the questionnaire.

Question Number	Engineering		Para-medical		Medical		Total		p-value
	N	%	N	%	N	%	N	%	
1	81	81.00	70	85.37	68	80.95	219	82.33	0.6880
2	54	54.00	42	51.22	44	52.38	140	52.63	0.9310
3	21	21.00	12	14.63	18	21.43	51	19.17	0.4550
4	53	53.00	53	64.63	50	59.52	156	58.65	0.2800
5	36	36.00	27	32.93	37	44.05	100	37.59	0.3090
6	39	39.00	24	29.27	44	52.38	107	40.23	0.0100*
7	42	42.00	36	43.90	51	60.71	129	48.50	0.0250*
8	25	25.00	37	45.12	36	42.86	98	36.84	0.0080*
9	13	13.00	16	19.51	17	20.24	46	17.29	0.3550
10	34	34.00	41	50.00	34	40.48	109	40.98	0.0920
11	19	19.00	32	39.02	22	26.19	73	27.44	0.0100*
12	49	49.00	46	56.10	51	60.71	146	54.89	0.2740
13	58	58.00	42	51.22	25	29.76	125	46.99	0.0000*
14	42	42.00	42	51.22	43	51.19	127	47.74	0.3480
15	41	41.00	42	51.22	43	51.19	126	47.37	0.2730
16	30	30.00	31	37.80	20	23.81	81	30.45	0.1470
17	33	33.00	24	29.27	44	52.38	101	37.97	0.0040*
18	12	12.00	19	23.17	17	20.24	48	18.05	0.1230
19	9	9.00	28	34.15	42	50.00	79	29.70	0.0000*
20	24	24.00	18	21.95	26	30.95	68	25.56	0.1230

* Statistical significance at p <0.05 level.

Table- 3: Percentage of males and females whose oral health knowledge corresponded with the most appropriate response in the questionnaire.

QUESTION	BOYS		GIRLS		p-value
	N	%	N	%	
1	85	34.8	134	54.9	0.3110
2	48	19.7	92	37.7	0.0380*
3	16	6.6	35	14.3	0.1520
4	59	24.2	97	39.8	0.3420
5	45	18.4	55	22.5	0.2190
6	46	18.9	61	25.0	0.4510
7	51	20.9	78	32.0	0.8240
8	30	12.3	68	27.9	0.0150*
9	18	7.4	28	11.5	0.8680
10	36	14.8	73	29.9	0.0460*
11	27	11.1	46	18.9	0.5080
12	49	20.1	97	39.8	0.0150*
13	48	19.7	77	31.6	0.5680
14	45	18.4	82	33.6	0.1280
15	51	20.9	75	30.7	0.9370
16	27	11.1	54	22.1	0.1300
17	43	17.6	58	23.8	0.5420
18	21	8.6	27	11.1	0.5830
19	37	15.2	42	17.2	0.1540
20	22	9.0	46	18.9	0.0470*

Statistical significance at p <0.05 level.

Table- 4: Comparison of Oral Health Knowledge among boys and girls.

GENDER	MEAN	S.D	t-value	p-value
BOYS	13.5981	5.8903	-2.3302	0.0206*
GIRLS	15.2516	5.5255		

*Level significantly different at p <0.05.

Table- 5: Comparing the Oral Health Knowledge among students of different Professional courses.

PROFESSIONS	Engineering	Medicine	Paramedical
Mean Knowledge	12.8700	15.8210	15.4150
Engineering	-		
Medicine	0.0010*	-	
Paramedical	0.0063*	0.8857	-

*Level significantly different at p <0.05.

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