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## **Oral health knowledge, attitude and practices among medical students: A cross-sectional observational study**

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**Abstract**---AIM: Aim of the study was to evaluate oral health knowledge, attitude and practices among medical students. Objective: To assess the knowledge, attitude towards Oral health and personal and professional oral health practices among medical students. Material and Methods: A cross sectional survey was conducted using structured self-administered 20 item questionnaire, as Google form to

all the medical students of ESIC, Sanath Nagar, Hyderabad. All the completely filled in forms within 15 days were included in the study. Descriptive statistics were computed and data was presented in the form of tables and graphs. Results: A total of 250 out of 400 participants had submitted completely filled in questionnaire. among whom 40% (100) were males and 60% (150) were females. About 58% (145) had a dental visit previously. About 48% (120) experienced gum bleeding. About 28% (71) opted to refer a patient with facial swelling to a general surgeon instead of dentist. About 56% (140) felt untreated dental pain may lead to serious life threatening condition. About 74% (185) felt visiting a dentist would give them correct information about dental issues. Conclusion: Overall the participants had moderate knowledge, attitudes and practices towards oral health, which were found better with increasing years of medical education. There is a need to create awareness in the form of continuing oral health education and its relationship to general health among medical students.

**Keywords**---dentistry, awareness, medical students.

## **Introduction**

It is said that the “Mouth is a mirror of the body” as Eyes are the window to the soul”. A hypothesis was given by Hippocrates (460-377BC) stating the relation of oral health and general health. In 1778 John Hunter a surgeon stated that diseases of the teeth may produce serious complications in adjacent parts of the body. Which was related to Focal infection theory proposed by Benjamin Rush in 1818 and series of articles proposed by Miller in 1891.<sup>1</sup> Medical students are expected to know the consequences of tooth pain? Despite several studies and research from times immemorial, it is still found that there is a lack of awareness of Dental health among the medical students. Hence, our study intended to make out the knowledge among all medical students on Dental issues.

## **Materials and Methods**

This was a questionnaire-based study conducted among medical students (First year- Final year) students of ESIC medical college and Hospital Santhnagar, Hyderabad, Telangana. The questionnaire consisted of 20 questions and the reliability was assessed using Cronbach’s alpha was 0.92 and content validity ratio was 1. Apart from these 20 questions, the other data collected included participant’s age, gender and year of education. The questionnaire was prepared in Google Forms. Google Forms is an application part of Google suite which used to create surveys and analysis the data. The questionnaire was sent to 400 students which included 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and the 4<sup>th</sup> year medical students through email and social networking sites such as whatsapp in the month of Jan 2021. The student’s details were obtained from administrative section and participants were requested to respond to the questionnaire within 15 days. The participants were asked not to discuss among their friends while marking the responses, as our objective were to know the knowledge, attitude and practices of the

participants. At the end of Survey, 250 responses were received in Google forms. The study protocol was approved by the Institutional ethical committee (IEC). Statistical Analysis: All the submitted responses from the participants were automatically analyzed by the Google forms tool. A spreadsheet was made along with a bar and pie diagram. The spread sheet was subjected to analysis using SPSS 25.0 to generate frequency distribution tables and graphs.

## **Results**

Among the 400 participants to whom the questionnaire was sent, 250 students submitted their responses. The age of the respondents ranged from 17-23 years. The gender and batch wise distribution of the respondents are shown in tables 1 and 2 respectively. Among the participants, 40% (n=100) were males and 60% (n=150) were females as shown in Table 01. About 14.8% (n=37) were 1<sup>st</sup> year students, 20% (n=50) were 2<sup>nd</sup> year students, 31.2% (n=78) were 3<sup>rd</sup> year students, 34% (n=85) were fourth year students as shown in Table 02.

### **Personal Dental Questions**

About 63% of population participated in survey and results are shown in Table 03. While about 58% of students have visited dentist previously, and it is 3<sup>rd</sup> and 4<sup>th</sup> years that were in greater proportion when compared to 1<sup>st</sup> and 2<sup>nd</sup> years. When it comes to taking self-medication for dental pain, 44% of the participants had taken self-medication, the proportion of such students in 1<sup>st</sup> and 2<sup>nd</sup> year students were higher than among 3<sup>rd</sup> and 4<sup>th</sup> years, and in order to maintain oral hygiene about 69 % students used tooth brush and paste, whereas 18% use mouthwash and 13.2% use dental floss along with the above. About 67.6% (25) among 1<sup>st</sup> years, 40% (20) among 2<sup>nd</sup> years, 57.7% (45) among 3<sup>rd</sup> years and 35.3% (30) among 4<sup>th</sup> years experienced gum bleeding at least once in their lifetime. About 8.1% (3) among 1<sup>st</sup> years, 10% (5) among 2<sup>nd</sup> years, 12.8% (10) among 3<sup>rd</sup> years and 11.7% (10) among fourth years had a bad experience with dental treatment previously. About 64.8% (24) 1<sup>st</sup> years, 60% (30) 2<sup>nd</sup> years, 57.7% (45) 3<sup>rd</sup> years and 70.6% (60) 4<sup>th</sup> years were confident about their smile.

### **Knowledge Questions**

About 35.14% (13) 1<sup>st</sup> year, 30% (15) 2<sup>nd</sup> year, 23.08% (18) 3<sup>rd</sup> years and 29.41% (25) 4<sup>th</sup> year students opted to refer a patient with facial swelling to General surgeon and the remaining 64.86% (24) among 1<sup>st</sup> year, 70% (35) among 2<sup>nd</sup> years, 76.92% (60) among 3<sup>rd</sup> years and 70.59% (60) among 4<sup>th</sup> years opted to refer to dental surgeon. Similarly 3<sup>rd</sup> (76.9%) and 4<sup>th</sup> (70.6%) year students preferred referring a trismus patient to a Dental surgeon. About 76% of 3<sup>rd</sup> and 70% of 4<sup>th</sup> year students had the knowledge of ill fitting denture being one of the causative factor for causing cancer, and coming to ideal period for treating a pregnant women for dental issues, it was observed that only 3<sup>rd</sup> year (64%) and 4<sup>th</sup> year students (74%) had knowledge. It was about 60% students who felt sinusitis could be misunderstood with tooth pain, 70.59% felt gums are affected in Diabetes, Renal disease and pregnancy. About 56% students felt untreated dental problems may lead to life threatening conditions and 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> years (70%) felt they would consider changes in dental treatment plan for patients on

antiplatelet and anticoagulant therapy. About 67% students feel the reason for replacement of missing teeth is both esthetics and chewing, whereas 19.2% feel esthetics as priority and 14% feel chewing as reason for replacement of missing teeth, and coming to flourosis effecting teeth was correctly answered by 82% of the 4<sup>th</sup> year students, and majority of students (78%) except few first years had an idea about Ludwigs angina being a dental issue. It was 74% of students who felt that only dentist can give more apt information regarding dental issues rather than YouTube and Google as shown in Table 04.

## **Discussion**

Oral health is a combination of Systemic and Local factors. Oral health conditions such as dental caries and periodontitis are among the most common diseases affecting humans. *S.mutans* has been implicated as the principal bacterial component responsible for dental caries in humans while bacteria residing in the dental plaque are the principal etiologic agents for periodontal disease.<sup>(2,3)</sup> Besides causing tooth loss, complications of caries can occasionally cause life-threatening situations like cellulites and Ludwig's angina. Regarding periodontitis, scientific studies clearly demonstrate the direct and harmful effect of gum disease with coronary heart disease; increase the severity of diabetes; contribute to low pre-term birth weights, respiratory disease, interfere with proper digestion, play a role in osteoporosis, stresses the immune system, lowers resistance to other infections, and reduces life expectancy.<sup>(3,4)</sup> Among various factors affecting oral health, local factors can be managed with regular dental hygiene practices and regular dental check-up. Local factors which influence oral hygiene are host, microbiota and substrate, this was termed as Triad of Keyes. A modification of the triad of Keyes concept proposed by Newbrum, added a time factor to the analysis because caries is a chronic disease and its signs or symptoms on dental surface take time to be detected clinically.<sup>5</sup> n oral hygiene practice begins from childhood. Poor maternal oral hygiene and dietary habits can increase the likelihood of transmission of the infection from mother to child due to sharing of food, utensils and habits which involve close contact.<sup>4,5</sup> Hence regular dental check-up and knowledge of speciality in dentistry is of utmost importance.

## **Attitude questions**

Currently, major professional associations' (American Academy of Pediatric Dentistry) recommendations converge to the first dental visit taking place early, at the time of the first tooth eruption (around age 6 months) or by age 1 year.<sup>6</sup> Parents of the new born get knowledge on disadvantages of bottle feeding and chances of early child hood caries, procedure to use finger and Gauze for cleaning alveolus to maintain oral hygiene. Unfortunately 42% of students have never been to dentist. When it comes to maintaining Oral hygiene, mechanical and chemotherapeutic approaches which include tooth brushing, flossing and mouthwash are most commonly used, which aims to modify the oral microflora to promote healthy periodontal and dental tissues.<sup>7</sup> In our study 68.8% of students use only tooth brush, 18% use mouthwash, and 13.2% use dental floss to maintain oral hygiene on regular basis along with the above. Despite maintaining proper oral hygiene, we tend to experience Gum bleeding experience due to inadequate plaque removal, which results in the thinning, ulceration, necrosis of

gingival epithelia coupled with engorgement of blood vessel. Gingival bleeding on tooth brushing is a form of provoked bleeding, a vital feature and probably one of the most frequent complaints among patients with periodontal disease. Gingival bleeding occurs alongside other manifestations of periodontal diseases like gingival swelling, halitosis, food lodgement, pain, gingival recession, and tooth mobility.<sup>8</sup> In our study, 52% (n=130) experienced gum bleeding. Coming to the fact of taking self-medication and being in medical profession and having knowledge on analgesic, there is increased tendency to take pain killers. In our study 44% of the respondents have taken self-medication for dental problems.

Regular Dental visits will build confidence when you smile, and 63.6% of students were or were confident of their smile. From survey results we could see that, 88.8% of participants had good experience with their Dentist. Having the knowledge of when to refer a patient in pain to a dentist is very important, as per survey, 72% of students believed that facial swelling patient should be referred to dentist. Rosenquist K in 2000 stated ill fitting dentures as major risk factors for oral cancer.<sup>9</sup> In our study, 66% of the respondents believed that there are chances of getting cancer due to ill fitting dentures whereas 34% believed that there was no correlation between cancer and ill fitting denture. Further coming to safer period in pregnancy, in a study conducted by Zanata et al 94% affirmed that treatment can be performed at any period, preferably between the 16<sup>th</sup> and 32<sup>nd</sup> weeks of pregnancy.<sup>10</sup> Whereas in our study about 22% felt 1st trimester was safe for the dental treatments, 66% as 2<sup>nd</sup> trimester and the remaining 18% felt 3<sup>rd</sup> trimester was safe. Pain manifested specially in maxillary premolars and molars could be of sinus origin<sup>11</sup> due to innervations of maxillary division of trigeminal nerve. Hence sinusitis pain is misunderstood to be tooth pain, which is correctly answered by about 60% of participants. As stated earlier, gum disease may be due to several local factors such as maintaining oral hygiene and brushing techniques. Apart from that systemic factors also play a major role and can be evident on the Gums.

It is 60% of participants who mentioned Diabetes mellitus, Pregnancy and Renal disease affects Gum health. About 24% felt gums are affected in diabetes mellitus, 4.80% in renal disease, 11.20% in pregnancy. Any sort of oral diseases are usually identified as infections and distinguished from inflammatory conditions due to the presence of swelling, severe pain, generalised malaise, cervical lymph node involvement and fever. If the signs and symptoms have developed rapidly, then immediate intervention is required to avoid further spread.<sup>12</sup> In this study 56% of participants feel that untreated dental pain may lead to life threatening condition. A previous study shows that 41.6% of the participants do not know the consequences of ignoring the dental problems and about 50% of the participants are unaware of systemic diseases related to dental problem.<sup>13</sup> However management of Oral disease depends on local and systemic conditions, which also includes medication which the patient is taking. Especially treatment plan change for patients with antiplatelet and anticoagulant therapy as stated by Burger et al wherein they reviewed 474 studies regarding the impact of low-dose aspirin on surgical blood loss. They stated that, in patients on aspirin, the average risk of intra-operative bleeding increases by a factor of 1.5.<sup>14</sup> About 70% felt they would consider changes in dental treatment plan for patients on anti-platelets and anticoagulants and the remaining 30% did not agree with this.

Purpose of replacement of lost teeth-The complications of not replacing teeth are improper speech, the inefficiency of mastication, changes in Occlusal stability, the occurrence of temporomandibular joint disorders, lifting and drifting of teeth & alveolar bone loss.<sup>15</sup> About 19.20% felt missing teeth should be replaced for esthetics, 15% for chewing and 66.80% opted both. Effect of fluorosis on teeth-Esthetics changes in permanent dentition are the greatest concern in dental fluorosis, which are more prone to occur in children who are excessively exposed to fluoride between 20 and 30 months of age. It is also important to remind that the critical period to fluoride overexposure is between the ages of 1 year and 4 years, and the child would be free of risk around 8 years of age.<sup>5</sup> The safe level for daily fluoride intake is 0.05 to 0.07 mg F/Kg/day. Above this level, the risk of developing fluorosis due to chronic fluoride consumption will be evident.<sup>16</sup> About 90% (n=225) felt fluorosis affects teeth.

Primary teeth play an important role in chewing food, gaining the skills of speaking, and having a beautiful face and a child's confidence.<sup>17</sup> However, when the permanent tooth develops within the alveolar process, it may fail to erupt leaving the primary tooth in situ. This can be a consequence of crowding, ankylosis of the primary tooth or the presence of supernumeraries or other obstructions.<sup>18</sup> About 25.20% felt primary teeth in adults should be removed, 16% to be retained and the remaining 62.80% had no idea. Tooth related issue-Ludwig's anginas, potentially life-threatening cellulites, or connective tissue infection, of the floor of the mouth, due to involvement of sub mandibular, sublingual and submental spaces of the face usually occurring in adults with concomitant dental infections, if left untreated, may obstruct the airways, necessitating tracheostomy. Swelling of the submandibular space, while is concerning, the true danger lies in the fact that the swelling spread inward compromising the airway.<sup>19</sup> About 78% felt Ludwig's angina to be an oral health issue and the remaining 22% felt angina pectoris and cardiac tamponade as oral health related. Information on dental pain-About 74% felt they would get correct information on dental related issues from a dentist and the remaining 26% believed more in Google and YouTube. To conclude, the findings of this study suggest that a greater awareness among medical under-graduate students about dental problems and dentistry is desirable and greater emphasis should be given on dentistry in academics.

## **Conclusion**

It is found that most students have basic understanding of dentistry and when to visit or refer a patient to dentist. It is very important that every student should focus on their dental hygiene and should recommend to patients as well.

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### Legends

Table 01- Gender distribution

Table 02- Year of education

Table 03- Personal oral hygiene questions

Table 04- Knowledge questions

Table 1  
Gender distribution

Gender	N	Percentage
Male	100	40
Female	150	60
Total	250	100

Table 2  
Year of education

Year of Education	N	Percentage
1st year	37	14.8
2nd year	50	20
3rd year	78	31.2
4th year	85	34
Total	250	100



Table 3  
Personal oral hygiene questions

Questions	Options	1st year		2nd year		3rd year		4th year		Total	
		N	%	N	%	N	%	N	%	N	%
Did you ever visit a Dentist	Yes	10	27.03	25	50	50	64.10	60	70.59	145	58.00
	No	27	72.97	25	50	28	35.90	25	29.41	105	42.00
Have you ever taken self-medication for Dental pain	Yes	30	81.08	30	60	30	38.46	20	23.53	110	44.00
	No	7	18.92	20	40	48	61.54	65	76.47	140	56.00
What oral hygiene techniques you follow	Tooth Brush and Paste	27	72.97	30	60	50	64.10	65	76.47	172	68.80
	+ Mouth wash	5	13.51	10	20	20	25.64	10	11.76	45	18.00
	+ Dental Floss	5	13.51	10	20	8	10.26	10	11.76	33	13.20
Have you ever experienced Gum bleeding	Yes	25	67.57	20	40	45	57.69	30	35.29	120	48.00
	No	12	32.43	30	60	33	42.31	55	64.71	130	52.00
How frequently do you go for dental check up	Once in every 6 months	2	5.41	5	10	10	12.82	30	35.29	47	18.80
	Once in a year	8	21.62	20	40	40	51.28	30	35.29	98	39.20
	Never	27	72.97	25	50	28	35.90	25	29.41	105	42.00
Did you ever had bad experience related to dental treatment	Yes	3	8.11	5	10	10	12.82	10	11.76	28	11.20
	No	34	91.89	45	90	68	87.18	75	88.24	222	88.80
Are you confident about your smile	Yes	24	64.86	30	60	45	57.69	60	70.59	159	63.60
	No	13	35.14	20	40	33	42.31	25	29.41	91	36.40

Table 4  
Knowledge questions

Questions	Options	1st year		2nd year		3rd year		4th year		Total	
		N	%	N	%	N	%	N	%	N	%
Whom would you refer a patient with facial swelling	General surgeon	13	35.14	15	30	18	23.08	25	29.41	71	28.40
	Dental surgeon	24	64.86	35	70	60	76.92	60	70.59	179	71.60
Whom would you refer a patient with Trismus (reduced mouth opening)	ENT surgeon	10	27.03	10	20	9	11.54	20	23.53	49	19.60
	Dental surgeon	24	64.86	35	70	60	76.92	60	70.59	179	71.60
Do you think Ill fitting (improper fitting) Dentures can cause Cancer	General surgeon	3	8.11	5	10	9	11.54	5	5.88	22	8.80
	Yes	10	27.03	35	70	60	76.92	60	70.59	165	66.00
Which Trimester of Pregnancy is safe for Dental treatments	No	27	72.97	15	30	18	23.08	25	29.41	85	34.00
	1st Trimester	20	54.05	15	30	10	12.82	10	11.76	55	22.00
	2nd Trimester	10	27.03	25	50	50	64.10	65	76.47	150	60.00
	3rd Trimester	7	18.92	10	20	18	23.08	10	11.76	45	18.00

Do you think sinusitis is misunderstood with tooth pain	Yes	15	40.54	25	50	50	64.10	60	70.59	150	60.00
	No	22	59.46	25	50	28	35.90	25	29.41	100	40.00
Gums are affected in	Diabetes mellitus	20	54.05	10	20	10	12.82	20	23.53	60	24.00
	Renal disease	2	5.41	5	10	3	3.85	2	2.35	12	4.80
	Pregnancy	5	13.51	5	10	15	19.23	3	3.53	28	11.20
	All	10	27.03	30	60	50	64.10	60	70.59	150	60.00
Untreated Dental pain may lead to life threatening condition	Yes	10	27.03	30	60	50	64.10	50	58.82	140	56.00
	No	27	72.97	20	40	28	35.90	35	41.18	110	44.00
Would you consider any change in dental treatment plan for patients on Anti-platelet and Anti-coagulants	Yes	15	40.54	35	70	60	76.92	65	76.47	175	70.00
	No	22	59.46	15	30	18	23.08	20	23.53	75	30.00
Missing teeth should be replaced for	Esthetics	10	27.03	10	20	18	23.08	10	11.76	48	19.20
	Chewing	10	27.03	5	10	10	12.82	10	11.76	35	14.00
	Both	17	45.95	35	70	50	64.10	65	76.47	167	66.80
Do you think Fluorosis affects teeth	Yes	20	54.05	30	60	50	64.10	70	82.35	170	68.00
	No	17	45.95	20	40	28	35.90	15	17.65	80	32.00
Fate of primary teeth in adults	Removed	10	27.03	10	20	18	23.08	25	29.41	63	25.20
	Retained	10	27.03	10	20	10	12.82	10	11.76	40	16.00
	No idea	27	72.97	30	60	50	64.10	50	58.82	157	62.80
	Ludwigs	20	54.05	35	70	60	76.92	80	94.12	195	78.00
Which of the following is an oral health issue	Angina Pectoris	10	27.03	10	20	15	19.23	2	2.35	37	14.80
	Cardiac Tamponade	7	18.92	5	10	3	3.85	3	3.53	18	7.20
	You tube	5	13.51	5	10	8	10.26	10	11.76	28	11.20
Where do you think you can get correct information for dental issues	Google	7	18.92	10	20	10	12.82	10	11.76	37	14.80
	Dentist	25	67.57	35	70	60	76.92	65	76.47	185	74.00