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Original Article

Dentistry Section

Assessment of Oral Health Knowledge, Attitude and Self-Care Practice Among Adolescents - A State Wise Cross-Sectional Study in Manipur, North Eastern India

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ABSTRACT

Introduction: The World Health Organization global strategy of promoting oral health have shown vast improvements in developed countries but the scenario is glum among underprivileged communities due to lacunae in implementation of these promotional programs. Manipur, a North Eastern state in India, is one such marginalized area.

Aim: The study aimed to evaluate Knowledge, Attitude and Practice (KAP) towards oral health in 15-18 year adolescents residing in Manipur together with the association of these variables to sociodemographic factors.

Materials and Methods: This cross-sectional study included 810 healthy adolescents drawn from various primary health care centers spanning in all the nine districts of Manipur. A closed ended questionnaire for the purpose of collecting data was used in the survey.

Results: Of the total participants 90.9% had high knowledge, 79.8% had favorable attitude and 70.4% had adequate practice towards oral health. Education of the parents and respondents was the only factor significantly associated with all three variables, knowledge, attitude and practice. Significant and positive linear correlation between knowledge-attitude ($r=0.369$, $p<0.01$) knowledge-practice ($r=0.405$, $p<0.01$) and attitude-practice ($r=0.353$, $p<0.01$), were observed.

Conclusion: An overwhelming majority of the respondents had high knowledge, favorable attitude and sound practice with respect to oral health. A positive linear correlation exists between the knowledge, attitude and practice. Evidence based reinforcement programs should be introduced to further reduce the gap between knowledge, attitude and practice. The study will also serve as a reference value for use in future evaluation to help measure the effectiveness of the planned activities.

Future research needs to focus on establishing the dental caries prevalence and oral hygiene status of Manipuri youth.

Keywords: Dental survey, Epidemiology, Questionnaire survey

INTRODUCTION

Oral diseases affect nearly 3.9 billion people globally [1]. To overcome the global burden of oral diseases community oriented preventive and oral health promotional programs have been emphasized and prioritized by WHO to the general curative approach [2,3].

Manipur, a north eastern state in India, inhabited by multiethnic communities is one such marginalized area. Out of the total population of 2,721,756 of Manipur, 58.9% live in the valley and the remaining 41.1% in the remote hilly regions [4,5]. Oral health behavior data in Manipur is scarce and is urgently needed for planning and evaluating health promotional programs. Oral health problems directly or indirectly negatively impact the quality of life [6]. Oral affliction, like pain experience, problems with eating, chewing, smiling and communication due to missing, discolored or damaged teeth restricts activities in school/college, work, mood, enjoyment leading to loss of many potential hours [7]. Moreover, minors are the most vulnerable to behavioral risk factors influencing oral health like frequent consumption of sugar rich diet/drinks, use of tobacco and excessive consumption of alcohol [8].

Literature is replete with data regarding high prevalence of substance abuse, essentially tobacco, among children and adolescents in Manipur [9-12]. Oddly, oral health behavior data of Manipuris has barely been explored. Given the scenario there was an exigent need for a KAP survey related to oral health of Manipuri adolescents. The surveillance of oral health knowledge, attitude and self-care practice may help the public health administrators in specification of oral health messages/policies as well as development of behavioral modifications strategies relevant to this area [13,14].

AIM

The current study along with the observation of KAP also aims to verify that whether higher knowledge and attitude has a direct co-relation with positive health care practice in the given set up. Moreover, the relationship of KAP and socio-demographic factors regarding oral health has also been studied.

MATERIALS AND METHODS

This descriptive, cross-sectional study was conducted on Manipuri adolescents with age 15-18 years. Out of the nine administrative districts of Manipur, five are in the hilly areas and four are in the valley [4]. As the state inhabits multiethnic groups the study area included all the nine districts to provide a unique opportunity for assessing oral health of people with different ethnic background inhabiting different areas [4].

Considering an estimate of 50% knowledge level (as the prevalence of knowledge of oral health in this community was unknown), with 5% precision of error, 95% confidence interval,

and 80% power, the required sample-size was 384. To ensure adequate sample size in light of anticipated responsive rates, this estimate was doubled making a final sample size of 768. Finally the calculation result was rounded up to the closest number that matches well with the number of districts (9) to be surveyed making the final sample size to be 810. Stratified sampling methodology for data collection was used. The final sample size (n) was then divided by the number of districts (9) making the number of observation per district to be 90. A major dental health care center from each of the district was chosen. Adolescents with age 15-18 years visiting the primary health care center of the particular district were selected for the survey with prior permission from the head of the center. The exclusion criteria included: (i) those who were mentally or physically challenged and (ii) those who could not read or write. Healthy volunteers who gave written informed consent were included in the study. As the study involved participants less than 18 years of age written informed consent was also taken from the guardian or parent accompanying them. Ethical clearance was obtained from the Institutional Ethics Committee (IEC), Regional Institute of Medical Sciences {(Protocol: 0054/13/P version (017) Resolution: 17/9(II)/9/9/2015)}. The study has been conducted in full accordance with the World Medical Association Declaration of Helsinki.

The participants were presented with a standardized pre-tested closed ended questionnaire based on WHO oral health questionnaire for children [15]. A pilot study was conducted earlier on 20 young adults to check the validity and comprehensibility of the questionnaire. The results of the pilot study showed an acceptable clarity of the questionnaire and henceforth no editing was done. The questions were in the local dialect and English. It was a multiple choice questionnaire where the participants were asked to select the most relevant answer. Questionnaires were completed under supervision to ensure that no interpersonal communications were allowed. The participants were told the importance of answering the questions honestly and confidentially. The questionnaire was divided into four sections, each section comprising of seven questions.

In the first section questions were asked to provide information regarding the socio-demographic background of the participants. In the next section participant's knowledge was gathered about tooth cleaning aids and as what could cause or prevent tooth decay. For assessing knowledge, correct answers were given a score of one whereas incorrect answers and 'I don't know' answers were given a score of zero. Subjects were divided into high and low knowledge groups. Participants who scored four or more were categorized as belonging to high knowledge group and those with a score of three and below were considered to be in low knowledge group.

Section three consisted of questions exploring the attitude and perception of the participants regarding oral health and the dental care providers. If a participant's answer indicated a positive impact on oral health, the subject was considered to be having a positive attitude. Positive atitude responses were given a score of 1 and negative responses were given a score of negative one (-1) and 'I don't know response' were given zero score. Those who scored three or more were considered to be having a positive attitude and those scoring less than three were considered having a negative attitude towards oral health. The last section assessed the participant's oral health practices. Correct answers were given a score of one whereas incorrect answer and 'I don't know' answer were given a score of zero. Those scoring four or higher were thought of having adequate oral health care practices.

STATISTICAL ANALYSIS

The data was analyzed using the Statistical Package for Social Science version 21.0. Descriptive analysis was done. The frequency and percentages were calculated. Chi square test was done in order to test for group difference among the variables. The p-value of <0.05 was considered statistically significant. Inferential statistics (Mann-Whitney U test and Kruskal Wallis tests) were used to assess the difference. Correlation coefficient was used to evaluate the relationship between knowledge, attitude and practice using Spearman's rank correlation analysis.

RESULTS

All the respondents completed the questionnaire successfully. Most of the respondents were of 18 years of age and were females. Majority of the respondents had high school level education and higher number of parents had university level education as shown in [Table/Fig-1]. According to [Table/Fig-2], interestingly nearly all the participants knew that tooth brush was used for cleaning of the teeth. Most of the participants knew that teeth should be brushed twice a -day, in the morning and evening. Little more than half of the participants knew about flossing the teeth and the role of fluoride in tooth decay. Majority knew that sweet, sticky food causes tooth decay and that tobacco is bad for teeth. Overall 90.9% had high knowledge and 9.1% had low knowledge as shown in [Table/Fig-3]. Attitude towards oral health are presented in [Table/Fig-4].

Characteristics	N (%)
Gender	
Males	204 (25.2)
Females	606 (74.8)
Age (yrs.)	
15	65 (8.0)
16	139 (17.2)
17	22 (27.8)
18	381 (47.0)
Residential area	
Valley	279 (34.4)
Hills	531 (65.6)
Ethnicity	
Meitei	201 (24.8)
Tribe	535 (66.0)
Any other	74 (9.1)
Education/Grade	
No education	5 (0.6)
Primary education	336 (41.5)
High school and secondary education	469 (57.9)
Parents Education	
No formal schooling	36 (4.4)
Less than primary	25 (3.1)
Primary completed	80 (9.9)
Secondary school completed	209 (25.8)
High school completed	148 (18.3)
University completed	310 (38.3)
Don't know	2(0.2)
Source of Oral Health Information	
Newspapers and magazines	154(19.0)
Health workers	12(1.4)
Family and friends	48(5.9)
T.V and radio and internet	390(48.1)
Religious leaders /teachers	186(23.0)
Oral health Information, leaflets, brochures, posters etc.	20(2.4)

[Table/Fig-1]: Sociodemographic characteristics of the study respondent.

Characteristics/Variables	Correct answer (Score 1) N (%)	Incorrect answer/ I don't know answer (Score 0) N (%)
Knowledge about use of tooth brush for cleaning teeth	809 (99.9)	1 (0.1)
Knowledge about tooth brush frequency per day	700 (86.4)	110 (13.6)
Knowledge about the time of brushing/cleaning teeth	704 (86.9)	106 (13.1)
Knowledge about the use of dental floss	447 (55.2)	363 (44.8)
Knowledge about the ill effect of tobacco on teeth	743 (91.7)	67 (8.3)
Knowledge about the role of fluoride in tooth decay	466 (57.5)	344 (42.5)
Knowledge about the role of diet in tooth decay	744 (91.9)	66 (8.1)

[Table/Fig-2]: Respondents knowledge on oral health.

Variable	Frequency	Percentage (%)
Poor Knowledge	74	9.1
High Knowledge	736	90.9
Total	810	100

[Table/Fig-3]: Distribution of knowledge.

Characteristics	Correct answer (Score +1) N (%)	I don't know answer (Score 0) N (%)	Incorrect answer (Score -1) N (%)
Do you think that dental problem can affect general health	654 (80.7)	117 (14.4)	39 (4.8)
Do you think that regular visit to the dentist is necessary	671 (82.2)	98 (12.1)	41 (5.1)
Do you think immediate replacement of missing natural teeth by artificial teeth is necessary	417 (51.1)	315 (38.9)	78 (9.6)
Do you think that gutka/paan chewing /smoking is a bad habit	770 (95.1)	30 (3.7)	10 (1.2)
Do you think dentist care only about treatment and not prevention	569 (70.2)	193 (23.8)	48 (5.9)
Do you think that treatment of tooth ache is important as any other organ of the body	688 (84.9)	98 (12.1)	24 (3.0)
Are you afraid of going to the dentist	647 (79.9)	46 (5.7)	117 (14.4)

[Table/Fig-4]: Attitude towards oral health.

Variable	Frequency	Percentage (%)
Positive Attitude	646	79.8
Negative Attitude	164	20.2
Total	810	100

[Table/Fig-5]: Distribution of attitude.

A large proportion of the candidates showed "problem can affect general health", "regular visit to the dentist is necessary", "tobacco chewing is bad for health" and "treatment of toothache is important as any other organ of the body". The attitude scale showed that majority of the participants had a positive attitude towards oral health as shown in [Table/Fig-5]. According to [Table/Fig-6], most of them used toothbrush as tooth cleaning aid, took two to three minutes to brush their teeth and cleaned their teeth two or more times a day. Overall 70.4% practiced oral health adequately as shown in [Table/Fig-7].

Association of demographic characteristics and mean KAP scores: Demographic features and the mean KAP score co-relation

Characteristics	Correct answer (Score 1) N (%)	Incorrect answer/ I don't know answer (Score 0) N (%)
Time taken to brush your teeth	494 (61)	316 (39)
Frequency of cleaning teeth	547 (67.5)	263 (32.5)
Aid used for cleaning your teeth	807 (99.6)	3 (0.4)
Use of fluoridated toothpaste.	493 (60.9)	317 (39.1)
Routine dental check ups	234 (28.9)	576 (71.1)
Rinsing mouth after meals	415 (51.2)	395 (48.8)
Frequency of chewing paan	531 (65.6)	279 (34.4)

[Table/Fig-6]: Respondents oral care practices.

Practice	Frequency	Percentage (%)
Adequate	570	70.4
Inadequate	240	29.6
Total	810	100

[Table/Fig-7]: Distribution of practice.

are presented in [Table/Fig-8]. Education, ethnicity and source of oral health information showed statistically significant association with the mean KAP scores ($p<0.05$). Bonferroni adjustment using a general approach was used to investigate the significance among intergroup variables [16]. However, the knowledge and practice scores were significantly associated with the age and gender.

Correlation between knowledge, attitude and practice: Correlations were interpreted using the following criteria: 0–0.25 = weak correlation, 0.25–0.5 = fair correlation, 0.5–0.75=good correlation and greater than 0.75=excellent correlation [17]. [Table/Fig-9] revealed significant positive fair linear correlation between knowledge-attitude ($r = 0.369$, $p<0.01$) knowledge-practice ($r = 0.405$, $p<0.01$) and attitude-practice ($r = 0.353$, $p<0.01$).

DISCUSSION

KAP surveys have been extensively executed around the world for the past 40 years in public health, family planning, education and other programs [18]. Many KAP surveys concerning oral health have earlier been conducted in other states in India [19,20] and overseas [21-23]. The study, to the best of our knowledge, represents the first study of its kind that explored these issues in Manipur.

The majority of the participants reported having correct knowledge about the use, frequency and time of using tooth brush, as a tooth cleaning aid. This was higher to most studies reported in India and globally [19-22]. More than half of the participants were aware about the role of fluoride in preventing dental decay in contrast to only 29.6%, in a study on Saudi students in 2015 and only 18% in a study on Nepali children in 2013 [24,25]. The knowledge of the surveyed candidates in regards to the use of dental floss in preventing dental decay was 55.2%, which was somewhat curbed when correlating to Iranian students, which was 78.8%, in a study in 2015 [26].

A total of 90.9% belonged to the high knowledge group. Most students have reported lower scores. A study involving 858 children studying in class seven at various schools in Mangalore, India reported 54.5% belonging to low knowledge group [19].

The knowledge acquired in our study might have been gained either from television or through teachers. Possible reasons that can be attributed to this difference of response are demographic variation of the study population, study location and as well as the study tool used for data collection. The results notwithstanding, it is important that the population should be educated on all aspects of oral health rather than on a single or few issues. The adolescents

Variable			Knowledge	p-value	Attitude	p-value	Practice	p-value
Gender**	Male	204	5.2±1.5	<0.0001	5.1±2.4	0.918	4.1±1.7	0.017
	Female	606	5.8±1.3		5.0±2.1		4.4±1.5	
Age (yrs)*	15	64	5.5±1.2	<0.0001	4.8±2.0	0.408	4.5±1.4	0.035
	16	139	5.4±0.6		4.7±2.4		4.1±1.5	
	17	225	5.5±1.3		4.9±2.3		4.5±1.6	
	18	382	5.9±1.3		5.1±1.9		4.2±1.5	
Residential Area**	Valley	279	5.6±1.4	0.158	4.9±2.2	0.248	4.3±1.8	0.199
	Hill	531	5.7±1.4		5.0±2.1		4.3±1.4	
Ethnicity**	Meitei	200	5.3±1.4	<0.0001	4.5±2.3	0.017	4.0±1.8	0.001
	Tribal	534	5.7±1.4		5.1±2.1		4.4±1.5	
	Others	76	6.2±1.1		5.2±1.9		4.0±1.5	
Education*	No education	114	5.1=1.4	<0.0001	3.7=2.5	<0.0001	4.0=1.6	0.100
	Primary education	227	5.47±1.4		5.1±2.2		4.5±1.6	
	High school & secondary education	469	5.8±1.3		5.2±4.8		4.3±1.5	
Parent's education*	No formal education	36	4.8±1.8	<0.0001	4.6±2.0	<0.0001	3.6±1.6	<0.0001
	Less than primary	25	4.3±1.7		2.9±2.4		3.3±1.7	
	Primary completed	80	5.2±1.5		4.5±2.1		4.1±1.4	
	Secondary completed	209	5.5±1.3		5.1±2.2		4.4±1.4	
	High school completed	148	5.8±1.2		5.1±1.9		4.4±1.6	
	University completed	310	6.0±1.2		5.2±2.0		4.4±1.6	
	Don't know	2	4.0±1.4		4.0±1.4		2.0±1.4	
Source of oral health information**	Newspapers and magazines	154	4.9±2.4	<0.0001	4.0±1.3	<0.0001	5.0±1.6	<0.0001
	Health workers	12	4.3±1.4		2.5±1.6		4.3±2.2	
	Family and friends	48	4.6±1.7		3.8±1.2		5.5±1.5	
	TV radio and internet	390	5.2±2.1		4.5±1.5		6.2±0.9	
	Religious leaders/ teacher	186	4.8±2.1		4.2±1.6		5.6±1.3	
	Oral health information, leaflets, brochures, postersetc.	20	5.4±0.7		4.5±1.5		6.0±1.2	

[Table/Fig-8]: Association of demographic characteristics with knowledge, attitude and practice.
*Kruskal Wallis Test (p<0.05).
** Mann Whitney Test (p<0.05).

Variable	Correlation Coefficient	p-value*
Knowledge-Attitude	0.369	<0.01
Knowledge-Practice	0.405	<0.01
Attitude-Practice	0.353	<0.01

[Table/Fig-9]: Correlation between knowledge, attitude, and practice scores.
*Spearman's correlation significant at 0.01 level (2 tailed).

do have the basic knowledge in regards to tooth brushing but show limited knowledge with respect to the use of fluoridated tooth paste and dental floss.

The study findings suggest that 80.7% of the survey respondents consider dental problems can affect general health. This is more than that reported in a study in Nepali children (76%) and less than Iranian children (93.4%) with a similar belief [25,26]. Even though 82.2% of the surveyed youth stated that regular dental visit was necessary, the data showed that only 28.9% of them practiced it. This shows that the awareness of oral health does not necessarily influence good dental practice. The inhibition of visiting the dentist may perhaps arise from the negative impression about the dental care providers or lack of accessibility to dental services. Arrangements should be made or intensified in the form of periodic visits of dentist to school and frequent dental camps in the communities so that the people become familiar with the dentist.

Our study reported that 91.7% knew the ill effects of tobacco; however 34.4% still indulged in paan chewing which is noteworthy. Even though the knowledge is high, it seemed to be insufficient to influence the habit. A study conducted on Indian students by the Global Youth Tobacco Survey (GYTS) from 2000-2005 tracked that only 15% of students of Manipur had ever been taught about the ill effects of tobacco, which is derisory [11]. A total of, 34.4% of people still indulged in chewing paan, programs which help in transforming knowledge into practice needs to be reinforced.

Regarding socio-demographic variables, age and area of residence did not seem to affect the knowledge, attitude and practice in significance. Females showed better oral care practice than males however the knowledge and attitude was not affected by gender significantly. This is similar to most studies which have shown females consistently achieving better scores in KAP survey regarding oral health [27,28]. This is usually attributed to the fact that the females are more concerned about body and facial image, they would thus, be seeking regular dental care and taking more care of their oral health to maintain good appearance [28].

Significantly higher scores were obtained with the tribal community to other communities, regarding attitude and practice. Interethnic oral health disparity might be attributed to the different cultural beliefs and practices in regards to oral health among different ethnic groups in Manipur. Respondents having more educated parents scored more in knowledge, attitude and practices, with statistically significant difference. This highlights the importance and role of education in oral health. This is in similarity to most studies [29,30]. Cheung et al., and Wu et al., also reported education level as the significant factor associated with KAP scores of their study participants [30,31].

It was seen that though the knowledge and attitude of the participants increase with the increase in grade/class of study, the

practice is not substantially affected. Reinforcements programs regarding changing the knowledge into practice need to be evaluated and fortified.

The correlation revealed significant positive linear correlations between knowledge-attitude ($r=0.369$, $p<0.01$) knowledge-practice ($r=0.405$, $p<0.01$) and attitude-practice ($r=0.353$, $p<0.01$). The positive linear correlation reaffirms that better knowledge can lead to positive attitude and subsequently good practices. This will help in prevention and management of oral diseases.

There are certain advantages with the study. Targeting youths seems to be most appropriate for procuring information about the oral health status of a place as they disclose information about what is being taught/learnt from the school, parents and surroundings regarding oral health and what kind of attitude and habits have been groomed or are grooming which will eventually be carried in the next generation in the particular area [21].

Though the sample is a non-representative of the total population of young adults of the concerned state, it gives a reflection to the factual picture of the general population and we have no reason to believe that the sample taken was in anyway very different from the rest of the population.

As the participants were drawn from dental care centers in different districts, it offered a unique opportunity to survey diverse group of youth with a higher level of external validity. Thus, unlike results of most previous studies in other regions that recruited participants from specified school, our results were more generalized to the youths residing in Manipur.

We acknowledge that the data collection method may have certain limitations [32]. Bias could be introduced as the participants tend to give socially desirable responses like overestimating the frequency of tooth brushing and underestimate negative behavior such as consumption of sugar, paan and tobacco. Dental caries prevalence and oral hygiene status of the targeted youth need to be established to validate the results of the study [33].

The study is implied to serve as an educational diagnosis of the region. The study will also serve as a reference value for use in future evaluation to help measure the effectiveness of any planned activities by the public health administrators.

LIMITATION

Future research needs to focus on establishing the dental caries prevalence and oral hygiene status of Manipuri youth. Furthermore as this was a short term preliminary study KAP surveys need to be done considering other aspects about oral health to glean complete information.

CONCLUSION

An overwhelming majority of the survey respondents had high knowledge, favorable attitude and sound practice with respect to oral health.

Educational level of parents seemed to have a direct relationship with all the three variables, knowledge, attitude and practice. A positive linear correlation exists between the knowledge, attitude and practice.

Although there are limitations with this type of research, we hope that the findings inspire additional research that seeks to raise awareness regarding the value of oral health. The study also serves as a base line for use in future assessments.

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