



## A CROSS SECTIONAL STUDY ON INFLUENCE OF GENDER, EDUCATION AND AREA OF LIVING ON LEVEL OF KAP (KNOWLEDGE, ATTITUDE AND PRACTICE) OF ORAL HEALTH ON EAST MIDNAPORE REGION

<sup>1</sup>Dr. Shaoni Pramanik,<sup>2</sup>Dr. Jayeeta Majumder,<sup>3</sup>Dr. Sourav Gangopadhyay

<sup>1</sup>Student of Masters of Public Health,<sup>2</sup>Assistant Professor,<sup>3</sup>Assistant Professor

<sup>1</sup>Masters of Public Health

<sup>1</sup>Haldia Institute of Management, Haldia, India

**Abstract :** This study has conducted to find out the level of knowledge, attitude and practice of oral health among 181 people of East Midnapore region of west Bengal. A structure questionnaire has designed containing 32 numbers of close ended questions. A convenient sampling method is following. Three hypotheses are formulated – first one was on to find out whether or not gender is influencing the KAP level on oral health, second one was one to find out whether or not level of education is influencing the KAP level on oral health and last one was on to find out whether or not area of living is influencing the KAP level on oral health. One way ANOVA, Welch, Brown-Forsythe and independent sample t test were conducted with the help of SPSS software 21 version. The result shows gender and level of education are influencing the level of KAP of oral health as the P value in those cases are less than .001 and .021 respectively but the area of living is showing insignificant influence as the P value in that case is .269.

**IndexTerms - Oral Health, KAP, East Midnapore, gender, area of living, level of education.**

### Introduction

Mouth as well as oral cavity is mostly exposed to environment and it is said that oral health is a mirror of psychological identity (Jin, et. al. 2016). Oral health is the vital aspect of good health (Shah et al.2013). Proper maintenance of oral hygiene will be enough to prevent gum diseases, cavities, mouth ulcers, mouth sore and many more (WHO, 2015). Researchers have shown that a significant correlation is existed between good oral health and knowledge of oral health (Freeman, et. al. 1993; Kay et. al. 1998). It was observed that nearly 80% of the oral diseases can be prevented only by adopting good oral hygiene practice (Bakdash, 1995). It was studied that most west industrial countries are able to reduce oral health program only by successfully adopting oral health program (Marthaler, 1995). Oral health can only be assured by having proper knowledge, attitude and practice of oral hygiene (Gulshan, 2017). Researchers have studied that; Indian people do not have proper education on oral health (Gopikrishna et. al. 2016). Some other group of scientists have also found that dental condition and awareness on dental health is poor among Chinese people too (Lo EC et. al. 2001). Level of KAP i.e. Knowledge, attitude and Practice among adult and children is an essential tool to assess the oral health and it is used by many researchers (Mehta, et. al. 2012; Harikiran et. al. 2008). Many researchers have studied level of KAP on oral health in different location and with people of different demography like a comparative study on KAP among dental student and medical student (Kumar, et al. 2017),

other researcher from Saudi Arabia have done same kind of study on student of different discipline like art and science, economic and administration, public health engineering (Jaber, et. al. 2017) and medical (Mulla, et. al. 2016) ; other group of researchers from Ethiopia studied level of KAP on oral health among students of medicine, nursing pharmacy etc (Bashiru et. al. 2016), on the other hand level of KAP on oral health among people of different socio economic background, from various discipline from various countries (Peltzer, et. al. 2014) also been studied. So now let's look how researchers have shown how level of KAP is associated with demography.

### **Level of Knowledge attitude and practice or KAP of oral health of people of different socio demographic background**

Many researchers have found that there is different level of KAP existing among people of different gender. Some have found that level of KAP of oral health is high in female population (Oberoi, et. al. 2014; Younus, et. al. 2016; Oogarah, 2007). Similar kind of finding can also be found in some research papers and they are saying that female students are having significantly higher KAP score on oral hygiene than that of male students (Zafar, 2015). On the other hand some researchers have found that female population is having higher level of KAP on oral health than male but the gap is not statistically significant (Jaber, 2017) but some other researchers have shown that level of KAP is higher in case of male population (Konwar, 2019). It was observed by researchers that the level of KAP is not significantly different among people from different region like urban and rural but there is significant gap existing between rural urban people in practice score (Humagain, 2011). On the other hand, some researchers have found urban people are having more KAP score on oral hygiene than rural people but the gap is not significant (Zafar, 2015). Many researchers have found that there is significant correlation between level of KAP and education. It was evident that more educated person is having higher level of KAP on oral health (Yildiz et. al. 2011). It was found that the educated people are more aware of oral health and they are always cautious about their oral health more than the poor educated people (McKeown et. al. 2014; ). On the other hand some researchers have shown that the Level of knowledge not significantly depending upon the education, but educated people are having numerically higher score in attitude and practice on oral hygiene but the gap is not significant (Patil et. al. 2016; Bhardwaj, 2019). Most of the researchers have shown that the level of KAP on oral health is low in case of old age population (Gao et. al. 2018; Zhu et. al. 2005; LiX et. al. 2018; McQuistan et. al. 2015), though some researchers have found opposite result as their research indicates that people becoming more aware of their oral health as their age is advancing (Gabrenya et. al. 1996).

### **Hypothesis**

**H<sub>0</sub>** Level of Knowledge Attitude and Practice on oral hygiene is not significantly depending upon Gender

**H<sub>a</sub>** Level of Knowledge Attitude and Practice on oral hygiene is significantly depending upon Gender

**H<sub>0</sub>** Level of Knowledge Attitude and Practice on oral hygiene is not significantly depending upon Level of education

**H<sub>a</sub>** Level of Knowledge Attitude and Practice on oral hygiene is significantly depending upon level of education

**H<sub>a</sub>** Level of Knowledge Attitude and Practice on oral hygiene is not significantly depending upon area of living

**H<sub>0</sub>** Level of Knowledge Attitude and Practice on oral hygiene is significantly depending upon area of living

### **Methodology**

A survey has been conducted on 181 respondents from East Midnapore district West Bengal. In this study, the respondents are from different socio demographic background. In this study the convenient sampling method is used. Among 181 respondents, 8 of them gave incomplete answers, so that is how ultimately a total of 173, are being selected for the study. A questionnaire is formed in Google form and respondents are being contacted and the link of the Google form is shared to them. In the questionnaire the purpose of the study is being informed to the respondents and only interested respondents have participated in this study and they were not forced to involve in the study. The questionnaire is having two parts. The first part is containing the information of socio-demographic information of the respondents like –Gender, Age, type of area they are living, Religion, educational background and occupation. The second part is containing 32 numbers of close ended questions. It

is also composed of three parts – questions covering knowledge, questions covering attitude and lastly the question covering practice. In the knowledge part 8 numbers of questions are included, in the attitude part 8 numbers of questions are included and lastly in the practice part 16 numbers of questions are included. Questions are multiple choice types. The questionnaire is developed by going through several research papers (Kiran et. al. 2019; Zafar, 2015) and by having interview session with different dentists. After having responses from all the respondents, a descriptive study has conducted and after that, analytical studies are being conducted like t-test and ANOVA test. The entire data have coded and analyzed by SPSS 21 software. In this study correlation between level of knowledge, attitude and practice on oral hygiene and different socio-demographic characteristics such as Gender, Age, type of area they are living, Religion, educational background and occupation are shown. Before doing the hypothesis testing, a descriptive study has been conducted to know the distribution of the sample and to test the first hypothesis independent sample t test has been conducted and case of second, third and fourth hypothesis one way ANOVA has been conducted. To test the reliability, Cronbach's Alpha or the coefficient alpha is carried out to know the internal consistency.

#### Distribution of the sample

SI No	Particulars	Number of Respondents	Percentage
1	Gender	Male	75 43.3526
		Female	98 56.6474
2	Area	Village	80 46.24277
		Town	56 32.36994
		City	37 21.38728
3	Educational Qualification	School Level	8 4.624277
		HS	62 35.83815
		UG	78 45.08671
		PG	25 14.45087

The above table is showing that total 173 numbers of people are included in the study. Among 173 people 75 i.e. 43.3526 are male and 98 i.e. 56.6474% of them are female; 80 i.e. 46.24277% of them are from village, 56 i.e. 32.36994% of them are from town and 37 i.e. 21.38% of them are from city, 8 i.e. 4.624277% of them are having school level education, 62 i.e. 35.83% of them are having higher secondary level education, 78 i.e. 45.08% of them are graduate and 25 i.e. 14.45 % of them are post graduate.

#### Analysis

At first, we are going to be calculating the reliability. In this paper the Cronbach's Alpha or the coefficient alpha has been used with the help of SPSS software (21 versions). The Cronbach's Alpha or the coefficient alpha is used to measure the internal consistency of the research instruments which is ranging from 0 to 1. The highest possible value Cronbach's alpha coefficient is 1. Many researchers have suggested that if the value of Cronbach's Alpha is lying between .7 to .8 then it will be considered as acceptable. The Cronbach's Alpha of all the 32 items is given below.

Number of Items	Cronbach's Alpha
<b>32</b>	<b>.704</b>

So it can be seen that the value of Cronbach's Alpha in this case is .704 which is lying between acceptable regions. So we can say that our data is reliable. So the instrument which is used in the study is having the acceptable level of reliability and it is suitable for the study.

**1. The difference of Level of KAP between male and female population is not significant.**

		N	Mean (M)	Standard deviation (SD)	Standard Mean Error
KAP Score	Male	75	32.3467	5.66042	.65361
	Female	98	35.1327	3.45408	.34891

The Female group (N=98) was associated with a score of KAP M 35.1327 (SD = 3.45408), By comparison, the male group (N=75) was associated with a numerically lower score on KAP M= 32.3467 (SD = 5.66042), to see whether they are statistically and significantly different from each other or not, independent sample t-test has performed.

		Levene's Test for Equality of Variances	t-test for Equality of Means			
		F	Sig.	T	df	Sig. (2-tailed)
Total KAP Score	Equal variances assumed	4.581	.034	-3.998	171	>.001
	Equal variances not assumed			-3.760	115.057	>.001

Before conducting the t test, homogeneity of variance test has been conducted by considering Levene's Test but it is showing significant result as the P value in that case is .034. So groups are not homogenous. So, we need to look at the section which is managing the violation of homogeneity and it is showing that the difference in score of KAP is significant among people of different gender as the P-value is <.001. So from the above result, it can be concluded that the level of KAP is numerically and statistically different among people of different gender. Hence we reject the first null hypothesis which states that *Level of Knowledge Attitude and Practice on oral hygiene is not significantly depending upon Gender* and hence we need to accept the alternative hypothesis which states that *Level of Knowledge Attitude and Practice on oral hygiene is significantly depending upon Gender*.

**2. The difference of Level of KAP between people of different education level is not significant.**

	N	Mean	Std. Deviation	Std Error
School Level	8	28.1250	9.23406	3.26473
HS	62	32.9194	5.08066	.64524
UG	78	34.8974	3.49987	.39628
PG	25	35.2400	3.50333	.70067

The descriptive statistics associated with the score of KAP across all four groups are reported in the table above. It can be seen that the mean score of KAP of post graduates people (M=35.2400) is highest followed by undergraduates (M=34.8974), higher secondary (M=32.9194), and school level (M=28.1250). The standard deviation of people of PG, UG, HS and school level is 3.50333, 3.49987, 5.08066 and 9.23406 respectively. In order to test the hypothesis that the level of KAP is significantly different among people of different educational background, one-way ANOVA was performed. Before conducting the ANOVA, the assumption of homogeneity of variance was tested but it is showing dissatisfied result based on Levene's F test,  $F(3,169) = 3.496, p=.017$ .

Levene Statistic	df 1	df 2	Sig
3.496	3	169	.017

The above table is showing that the P-value or the sig value of Levene Statistics is .017 which is lower than .05. That means the groups are not homogenous, also we can say homogeneity of the variance is violated



	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	448.812	3	149.604	7.416	>.001
Within Groups	3409.211	169	20.173		
Total	3858.023	172			

The ANOVA table is showing significant result as the P value is less than .001 but we cannot rely on the ANOVA alone as Levene is showing violation of homogeneity. We need to conduct some other tests which can manage the violation of homogeneity. We have conducted Welch and Brown – Forsythe. The table below is showing the result of Welch and Brown-Forsythe and both of them are showing significant result. In case of Welch the P value is .021 and in case of Brown- Forsythe it is .033. So it means the level of KAP is both numerically and statistically different among people from different educational background.

	Statistic	df1	df2	Sig.
Welch	3.792	3	27.752	.021
Brown-Forsythe	3.899	3	13.883	.033

Hence we reject the second null hypothesis which states that *Level of Knowledge Attitude and Practice on oral hygiene is not significantly depending upon Level of education* and hence we need to accept the alternative hypothesis which states *Level of Knowledge Attitude and Practice on oral hygiene is significantly depending upon Level of education*

### 3. The difference of Level of KAP between people of from different area.

	N	Mean	Std. Deviation	Std Error
Village	80	33.3750	4.72101	.52783
Town	56	34.7143	3.65172	.48798
City	37	33.9189	6.02024	.98972
Total	173	33.9249	4.73607	.36008

The descriptive statistics associated with the score of KAP across all three groups are reported in the table above. It can be seen that the mean of KAP of people living in town (M= 34.7143) is highest followed by the people living in city (M= 33.9189), people living in the village (M=33.3750). The standard deviation of Village, Town and city are 4.72101, 3.65172 and 6.02024 respectively. In order to test the hypothesis that the level of KAP is significantly different in people from different area, one-way ANOVA was performed. Before conducting the ANOVA, the assumption of homogeneity of variance was tested and satisfied based on Levene's F test,  $F(2,170) = 2.071, p=.129$ .

Levene Statistic	df 1	df 2	Sig
2.071	2	170	.129

As the Levene is showing the insignificant result so it means that groups are homogenous that means homogeneity is not violated. So we can conduct ANOVA. The table below is showing that the level of KAP among people from different areas that is village, Town and city are not significantly and statistically different from each other as the P value is .269 which is higher than .05. Though level of KAP is numerically different among people from different areas but the gap is not significant. Hence we need to accept the third null hypothesis which states that *Level of Knowledge Attitude and Practice on oral hygiene is not significantly depending upon area of living*.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	59.088	2	29.544	1.322	.269
Within Groups	3798.935	170	22.347		
Total	3858.023	172			

## Discussion

This study is conducted on 181 people from east Midnapore region. Level of Knowledge, attitude and practice on oral health is calculated. Total KAP score on oral health is 43, and the average KAP score of all 181 respondents is 33.7397, which is 78.46%. This study is conducted to find out how different socio demographic factors like gender, education level, areas of living are influencing the level of knowledge, attitude and practice on oral health. So in a way to find it out three hypotheses has formulated. The first hypothesis was formulated to find out whether or not the gender is influencing the KAP level of oral health, and the analysis shows the significant differences existed as the P value in this case is less than .001. Female population has scored significantly higher score than male population in respect to the level of KAP on oral health. Same result can be found by other researchers, they have also shown same kind of result (Narker et. al. 2007; Schäfer, 2003). The second hypothesis was formulated to find out how education level is influencing the level of KAP on oral health. Four types of people are included in the study – people having school level education; HS level education, UG level education and PG level of education. The result shows that the people of different educational status are having different level of KAP score on oral health, and the higher educated people have scored significantly higher than those who are less educated and the P value in that case is .021 in case of Welch test and .033 in case of Brown-Forsythe test. The same result can be seen in other researches, they also have found significant gap existing among people of different educational status and higher educated people have scored highest (Neeraja et. al. 2011; Zenget. al. 2019). In case of third hypothesis which is formulated to find out how area of living is influencing the score of level of KAP of oral health. Three types of people are included – people from village, from town and from city. The result shows insignificant difference as the P value in this case is .269 which is higher than .05. The result is supporting many researchers (Iqbal et. al. 2011). They also failed to find out the significant gap existing among people from different areas.

## Conclusion

Very few studies have been conducted on oral health in East Midnapore, showed appreciable result based upon studies. This study presents oral health and hygiene maintenance dependency on few factors (gender, education level, area of living) of demographic data of East Midnapore district. As our study demonstrates female population take better position than male on basis of knowledge, attitude and practice towards oral hygiene maintenance. According to education level, higher educated people have better impact on oral health than less educated persons. And we found dissimilarities in answers of KAP among individuals from different areas. Here the study vividly evinces a dearth of awareness on oral hygiene maintenance in East Midnapore district and it indicates the necessity of oral health awareness programs in this area to ameliorate the oral health. A good oral health is a way of maintaining a good life style.

## Reference

1. Bakdash, B. (1995). Current patterns of oral hygiene product use and practices. *Periodontology* 2000, 8(1), 11-14.
2. Bala, K., Gupta, R., Ara. A., and Sahni, B. (2019). A KAP study of oral health status among adults in a rural area of Jammu District. *International Journal of Community Medicine and Public Health*, 6(1), 1-7.
3. Bashiru, B. O., & Omotola, O. E. (2016). Oral health knowledge, attitude and behavior of medical, pharmacy and nursing students at the University of Port Harcourt, Nigeria. *Journal of Oral Research and Review*, 8(2), 66-71.
4. Bhardwaj, T., Tandon, S., Chand, S. and Bhargava, A. (2019). Knowledge, attitude and practice towards preventive dental care- A KAP study. *Journal of Global Oral Health*, 2(1), 36-40.
5. Chanda, J., & Gulshan, U. (2017). Oral hygiene: Knowledge, attitude and practice among school children, Lahore. *Journal of the Liaquat University of Medical and Health Sciences*. 16. 170-174. 10.22442/jlumhs.171630528.

6. Freeman, R., Maizels, J., Wyllie, M., &Sheiham, A. (1993). The relationship between health related knowledge, attitudes and dental health behaviours in 14-16-year-old adolescents. *Community dental health*, 10(4), 397-404.
7. Gabrenya, W.K.; Kwang, K.K. (1996). Chinese Social Interactions: Harmony and Hierarchy on the Good Earth in *The Handbook of Chinese Psychology*; Bond, M.H., Ed.; Oxford University Press: Hong Kong, China, p. 309.
8. Gao, S. S., Chen, K. J., Duangthip, D., Lo, E. C. M., & Chu, C. H. (2018). Oral health care in Hong Kong. In *Healthcare Multidisciplinary Digital Publishing Institute*, 6(2), 45.
9. Gopikrishna, V., Bhaskar, N.N., Kulkarni, S.B., Jacob, J., & Sourabha, K. G. (2016). Knowledge, attitude, and practices of oral hygiene among college students in Bengaluru city. *J Indian Assoc Public Health Dent*, 14(1),75-9.
10. Harikiran, A. G., Pallavi, S. K., Hariprakash, S., &Nagesh, K. S. (2008). Oral health-related KAP among 11-to 12-year-old school children in a government-aided missionary school of Bangalore city. *Indian Journal of Dental Research*, 19(3), 236-42.
11. Humagain, M. (2011). Evaluation of knowledge, attitude and practice (KAP) about oral health among secondary level students of rural Nepal-a questionnaire study. *Webmed central dentistry*,2(3).
12. Iqbal M., Shakoor I., Ibrahim M. N., Zaman L.(2011). Oral Hygiene and Dietary Habits among Primary School Children, in Urban Karachi. *Pak Paed J*, 35(3), 128-34.
13. Jaber, M. F., Khan, A., Elmosaad, Y., Mustafa, M. M., Suliman, N., &Jamaan, A. (2017). Oral health knowledge, attitude and practices among male Qassim university students. *Int J Community Med Public Health*, 4(8), 2729-2735.
14. Jaber, M. F., Khan, A., Elmoasad, Y. M., Mustafa, M.M., Suliman, N. & Jamaan, A. (2017). Oral health knowledge, attitude and practices among male Qassim university students. *International Journal of Community Medicine and Public Health*, 4(8). 2729-35. 10.18203/2394-6040.ijcmph20173316.
15. Jin, L. J., Lamster, I. B., Greenspan, J. S., Pitts, N. B., Scully, C., &Warnakulasuriya, S. (2016). Global burden of oral diseases: emerging concepts, management and interplay with systemic health. *Oral diseases*, 22(7), 609-619.
16. Kay, E., & Locker, D. (1998). A systematic review of the effectiveness of health promotion aimed at improving oral health. *Database of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews* , 26:132-44
17. Konwar, G. , Borah, A., and Angeline. (2019). A descriptive study to assess the knowledge of oral hygiene among middle school students in selected school of Ranchi, Jharkhand. *IP Journal of Paediatrics and Nursing Science*, 2(1), 8-12.
18. Kumar, H., Behura, S. S., Ramachandra, S., Nishat, R., Dash, K. C., &Mohiddin, G. (2017). Oral health knowledge, attitude, and practices among dental and medical students in Eastern India–A comparative study. *Journal of International Society of Preventive & Community Dentistry*, 7(1), 58-63.
19. Liang, C. H. E. N. G., Shu-huan, S. H. A. N. G., & Dan, C. U. I. (2018). Impact of comprehensive health education on oral care knowledge, attitude and practice in the elderly in long-term care institutions. *Shanghai Journal of Stomatology*, 27(2), 181-184.
20. Lin, H. C., Wong, M. C., Wang, Z. J., & Lo, E. C. (2001). Oral health knowledge, attitudes, and practices of Chinese adults. *Journal of dental research*, 80(5), 1466–1470. <https://doi.org/10.1177/00220345010800051601>
21. Marthaler, T. M., Brunelle, J., Downer, M. C., König, K. G., Truin, G. J., Künzel, W., ...&Vrbic, V. (1996). The prevalence of dental caries in Europe 1990-1995. *Caries research*, 30(4), 237-255.
22. McKeown, L., Woodbeck, H., & Lloyd, M. (2014). A journey to improve oral care with best practices in long-term care. *Can J Den Hyg*, 48(2), 57-62.
23. McQuistan, M. R., Qasim, A., Shao, C., Straub-Morarend, C. L., &Macek, M. D. (2015). Oral health knowledge among elderly patients. *The Journal of the American Dental Association*, 146(1), 17-26.
24. Mehta, A., &Kaur, G. (2012). Oral health-related knowledge, attitude, and practices among 12-year-old schoolchildren studying in rural areas of Panchkula, India. *Indian Journal of Dental Research*, 23(2), 293.
25. Mulla, R. O., & Omar, O. M. (2016). Assessment of oral health knowledge, attitude and practices among medical students of Taibah University in Madinah, KSA. *Journal of Advances in Medicine and Medical Research*, 1-10.

26. Narker, J. C., & Rise, J. (2007). Distribution of oral health behavior in adults. *Community Dent Oral Epidemiol*, 49(1), 9-13.
27. Neeraja, R., Kayalvizhi, G., & Sangeetha, P. (2011). Oral health attitudes and behavior among a group of dental students in Bangalore, India. *European journal of dentistry*, 5(02), 163-167.
28. Oberoi, S. S., Mohanty, V., Mahajan, A., & Oberoi, A. (2014). Evaluating awareness regarding oral hygiene practices and exploring gender differences among patients attending for oral prophylaxis. *Journal of Indian Society of Periodontology*, 18(3), 369-74.
29. Oogarah-Pratap B. *Dietary habits in adults. Nutr Food Sci. 2007;37(6):442-51.*
30. Patil, R. U., Sahu, A., Kambalimath, H. V., Panchakshari, B. K., & Jain, M. (2016). Knowledge, attitude and practice among dental practitioners pertaining to preventive measures in paediatric patients. *Journal of clinical and diagnostic research: JCDR*, 10(12), ZC71-ZC75.
31. Peltzer, K., & Pengpid, S. (2014). Oral health behaviour and social and health factors in university students from 26 low, middle and high income countries. *International journal of environmental research and public health*, 11(12), 12247-12260.
32. Razak, P. A., Richard, K. J., Thankachan, R. P., Hafiz, K. A., Kumar, K. N., & Sameer, K. M. (2014). Geriatric oral health: a review article. *Journal of international oral health: JIOH*, 6(6), 110.
33. Schäfer, F., Nicholson, J. A., Gerritsen, N., Wright, R. L., Gillam, D. G., & Hall, C. (2003). The effect of oral care feed-back devices on plaque removal and attitudes towards oral care. *International dental journal*, 53, 404-408.
34. Shah, H. G., Ajithkrishnan, C. G., Sodani, V., & Chaudhary, N. J. (2013). Knowledge, attitude and practices among Gynecologists regarding Oral Health of expectant mothers of Vadodara City, Gujarat. *International journal of health sciences*, 7(2), 136-140.
35. Ullah, R. & Zafar, M. S. (2015). Oral and dental delivery of fluoride: A review. *Fluoride*. 48(3), 195-204.
36. WHO. "Health topics: Oral health". Available from: [http://www.who.int/topics/oral\\_health/en/](http://www.who.int/topics/oral_health/en/).
37. Yildiz, S., & Dogan, B. (2011). Self reported dental health attitudes and behaviour of dental students in Turkey. *European journal of dentistry*, 5(03), 253-259.
38. Younus, A., & Qureshi, A. (2016). Tooth brush changing frequency and associated socio-demographic and oral hygiene factors among residents of Karachi. *Journal of Dentistry and Oral Hygiene*, 8(2), 4-11.
39. Zeng, Y., Hu, X., Li, Y., Zhen, X., Gu, Y., Sun, X., & Dong, H. (2019). The quality of caregivers for the elderly in long-term care institutions in Zhejiang Province, China. *International journal of environmental research and public health*, 16(12), 2164.
40. Zhu, L., & Petersen, P. D. (2005). Hong-Ying wang, Jin-you Bian, Bo-xue Zhang. Oral health knowledge, attitudes and behaviour of adults in china. *Int Dent J*, 55, 231-241.