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Original Research Article

Self-reported bleeding gums and oral hygiene habits in rural areas of Peshawar

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ABSTRACT

Introduction: More than half of Pakistan's population resides in rural areas with lower average incomes than urban areas. Oral health issues are more prevalent in populations with lower economic status and are more prone to have periodontal problems.
Materials and Methods: A cross-sectional study of the adult population of rural area chosen from among those present at the time of data collection. Sampling Technique was non-probability. A self-administered interview-based questionnaire concerning oral health behavior and attitudes.
Results: 56% of the participants reported bleeding from their gums, 51.6% had perceived halitosis and a majority, 78%, indicated that their teeth needed cleaning. Regarding the frequency of brushing, the majority (41.2%) cleaned their teeth once daily. The majority (36%) used Miswak followed by Soft Brushes (32%) as their preferred cleaning tool. 38% of the participating populous used their brush till it became useless 38%.
The association of bleeding from gums with Type of brush, perceived halitosis and how often the participants changed their brush was found to be statistically significant. An association between halitosis and how a brush was changed was found to be statistically significant.
Conclusion: The people of Pishtakhara Bala had a poor oral health status and while a part of the population practices oral hygiene maintenance, more than half of the population had bleeding gums and halitosis.

1. Introduction

Oral Health issues have made way to being among the major public health problems as a consequence of their highly prevalent nature thus causing a strong social impact.[1] From 1990-2010 oral diseases have increased 20.8% worldwide; affecting about 3.9 billion people.[2]

Proper Oral health is considered to be crucial to an individual's general health and welfare. The necessity of a healthy oral cavity is signified by its ability to perform speech, consume nourishment and thus enabling socializing. Any active disease of the oral cavity would be detrimental to an individual's life experience and become a cause for distress.[3] Knowledge about Oral health is the prerequisite for an individual to become aware and begin adopting a behavior that will enable a healthier attitude towards oral health maintenance.[4] A study in a rural area of Bangladesh, a third world country similar to Pakistan, has children that are less aware when it comes to the subject of oral health and thus do not engage in habits that will prevent oral diseases.[5]

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A fact about rural areas is that there is a presence of few dentists in relevance to the size of the population, less dental care attitude of the populace, thus a higher prevalence of dental caries leading to loss of tooth, in retrospect to urban areas where dentists and dental clinics are quite abundant.[6] More than half of Pakistan's population resides in rural areas with lower average incomes than urban areas.[7]

Oral health issues are more prevalent in populations with lower economic status and are more prone to have periodontal problems.[8,9] Oral Health issues have a correlation with the economic status of a population, signifying that the population with a low economic status suffers more oral health issues, with an even more increase in developing countries.

Lack of awareness of oral health coupled with poor oral hygiene maintenance leads to a paradigm that manifests in the form of poor oral hygiene. Poor oral hygiene may lead to accumulation of plaque and ultimately to gum diseases in the form of gingivitis and periodontitis. In a rural area with a smaller number of dental healthcare workers than the population needs may lead to prevalence of a number of oral diseases such as gingivitis and periodontitis. In a study done in India, it was reported that 50% of the participants had gum disease out of which majority were from rural areas. This study was undertaken with the intent to determine how much the rural community is suffering from bleeding gums which is an indicator of gum disease.

2. Materials and Methods

An analytical cross-sectional study was conducted from July 2021 to September 2021 in a rural area called Pishtakhara Bala of Peshawar, Pakistan. A non-probability convenience sampling technique was employed. Our study included all the adult population of Pishtakhara Bala who consented to be part of the study and were present at the time of data collection. An interview based self-administered questionnaire pertaining to the oral hygiene habits, presence of any oral disease and attitude towards dental problems of the people living in rural areas was employed.

Data was analyzed in SPSS version 25, which formulated frequency, bars and charts of the habits and aptitude as well as the oral health status of rural folk. A chi square ratio was made with Education, gender of the participants as well as between different questions.

3. Results

A total of 250 people from the rural area participated in the study with 60.4% males (n = 151) and 39.6% females (n = 99). The mean age was 31.10 with a standard deviation of 12.88. The level of education of the participants is mentioned in Figure 1.

Results regarding oral hygiene are mentioned in $, some noteworthy aspects which are worth highlighting are that

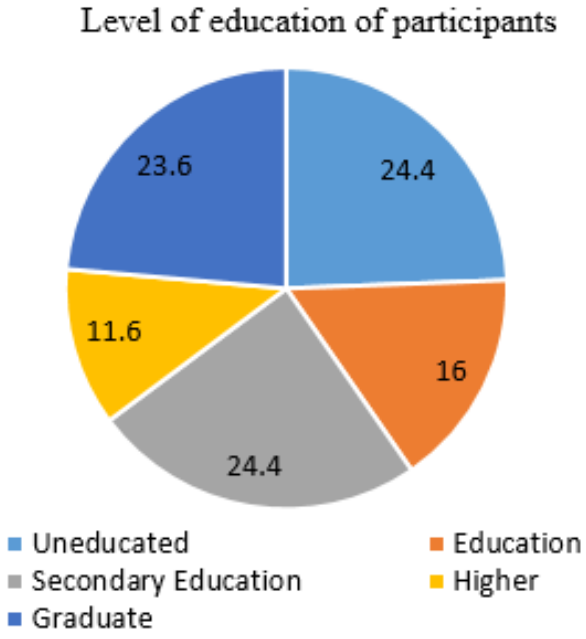

Fig. 1: Level of education of participants

Table 1: Simple yes or no questions about oral hygiene

Question	Yes	No
Are you Noticing Bleeding From Your Gums?	56%	44%
Are You Cleaning Your Teeth?	94.8%	5.2%
Are You Cleaning your Tongue?	43.2%	56.8%
Are you Rinsing Your Mouth After Eating?	60.8%	39.2%
Are You Using Mouthwash?	25.6%	74.4%
Are You Noticing Bad Smell From Your Mouth?	51.6%	48.4%
Do You Think Your Teeth Need To Be Cleaned Right Now?	78%	22%

a 56% of the participants reported bleeding from their gums, 51.6% had perceived halitosis and a majority, 78%, indicated that their teeth needed cleaning. Regarding the frequency of brushing, the majority (41.2%) cleaned their teeth once daily. The majority (36%) used Miswak followed by Soft Brushes (32%) as their preferred cleaning tool. 38% of the participating populous used their brush till it became useless 38%. The rest are mentioned in Table 2.

The association of bleeding from gums with Type of brush (P=0.018), perceived halitosis (P=000) and how often the participants changed their brush (P=0.043) was found to be statistically significant as seen in Table 3. An association between halitosis and how a brush was changed was found to be statistically significant (P=0.022) as seen in Table 3.

Table 2: Aptitude and practices of participants related to oral health

How Often Do You Clean Your Teeth?		
	Frequency	Percent
Never	14	5.6%
Occasionally	46	18.4%
Once Daily	103	41.2%
Twice Daily	61	24.4%
More than twice	26	10.4%
Total	250	100.0%
What Type Of Brush Do You Use?		
	Frequency	Percent
Miswak	90	36.0%
Hard	27	10.8%
Soft	82	32.8%
Medium	37	14.8%
Never Noticed/ No Brush	14	5.6%
Total	250	100.0%
How Often Do You Change Your Brush?		
	Frequency	Percent
Miswak	24	9.6%
When Useless	95	38.0%
In 3 months	94	37.6%
In 6 months	24	9.6%
In a Year	10	4.0%
Never	3	1.2%
Total	250	100.0%
Do You Use any of these Interdental Aids?		
	Frequency	Percent
Floss	36	14.4%
Interdental Brush	1	.4%
Wooden Toothpick	120	48.0%
None	93	37.2%
Total	250	100.0%

4. Discussion

In the study we conducted, a major portion of the target populous (42.5%) cleaned their teeth once daily and (23.7%) twice daily. Surprisingly some (4.3%) said they did not clean their teeth at all. Interestingly, a study in Kanchipuram, India showed that 52% brushed their teeth only once a day, 47% brushed twice a day and 0.5% of the populous brushed more than twice a day.[10] A study done at the University of Bristol showed that brushing daily caused a reduction in already present gingivitis.[11]

In our study, it was found that more than half of the participants (56.5%) reported bleeding from their gums which is a cardinal sign of gum disease. In contrast a study in Multan, Partisan showed only 29% of the participants suffering from bleeding gums. In our study, the major portion of the study populous despite cleaning their teeth once daily (42.5%) and twice daily (23.7%), a significant number still reported bleeding gums. This could be attributed to a fault in the brushing technique as a (40.4%) of the sample populous claimed to brush their teeth in a random irregular manner. This point is further strengthened by the fact that a study done in Iran reports that the cause of gingivitis is either due to faulty brushing technique or no brushing at all.[12]

In our study, toothpicks were mostly used as interdental aids (48%). It was surprising to know that floss usage was by a meagre 14.4%. Even though flossing is a necessary part of oral hygiene maintenance and much more effective at plaque clearance.[13]

In our study, only 25.6% participants reported that they used mouth wash while the remaining 74.4% did not. This is significant as mouth washes have plaque control effect which prevents periodontal diseases.[14]

In our study 56.8% individuals did not clean their tongues, a study done by J Jasmin Winnier showed that the participants that practiced tongue cleaning showed statistically significant decrease in plaque after a duration of 10 and 21 days when carried out alongside tooth brushing.[15]

In our study one significant issue was that the majority (38.2%) would use their brush until it got worn out completely, 37.7% were those who replaced their brush after a period of 3 months, 10.1% replaced it after 6

Table 3: Chi Square tests between different variables and questions

		If Yes How Often Do You Change Your Brush?							
		Miswak	When Useless	In 3 months	In 6 months	In a Year	Never	Total	Pearson Chi-Square
Are You Noticing Bad Smell From Your Mouth?	Yes	14.63%	39.3%	30.03%	9.24%	5.39%	0.77%	100%	
	No	3.85%	33.9%	42.35%	9.24%	2.31%	1.54%	100%	.022
Total		9.6%	38%	37.6%	9.6%	4%	1.2%	100%	
	What type of Brush do you use?								
		Miswak	Hard	Soft	Medium	**Never Noticed / No Brush**		Total	Pearson Chi-Square
Are you Noticing Bleeding From Your Gums?	Yes	41.18%	14.2%	27.7%	13.49%	2.84%		100%	
	No	28.8%	7.2%	37.8%	16.2%	9%		100%	.018
Total		36%	11.2%	32.4%	14.8%	5.6%		100%	
	If yes how often do you change your brush?								
		Miswak	When Useless	In 3 months	In 6 months	In a Year	Never	Total	Pearson Chi-Square
	Yes	13.6%	40%	36.4%	5.7%	3.6%	0.7%	100%	
Are you Noticing Bleeding From Your Gums?	No	4.5%	35.5%	39.1%	14.5%	4.5%	1.8%	100%	.043
Total		9.6%	38%	37.6%	9.6%	4%	1.2%	100%	
	Have you ever noticed bad smell from your mouth?								
			Yes			No		Total	Pearson Chi-Square
Are you Noticing Bleeding From Your Gums?	Yes		66.74%			32.66%		100%	
	No		24.85%			53.25%		100%	.000
Total			51.6%			48.4%		100%	

months and 3.9% after a year. A similar study was done in India where the majority (20.4%) changed their brush after a year, followed by 6 months (13.4%) then 3 months (11.7%).[16] These results while somewhat similar to ours showed that participants in the Indian study had better oral hygiene aptitude. According to a study done by the Dental Hygiene Departent of College of Medical Science, Konyang University, Korea, an increase in number of micro-organisms was seen on tooth brushes used for longer durations. The variety of bacterial species were 2.5 to 4 times more on toothbrushes that were in use for 3 months as compared to those that were in use for 1 month. Evidently tooth brushes being used for a year or till they are worn out or useless would become a nourishing medium for a large number of micro-organisms.[17] This may prove to have negative consequences on one's health as a research conducted by the University for Development, Nyankpala Campus, Ghana claimed that, there lies a risk of developing infectious diseases if proper toothbrush hygiene and maintenance is not observed.[18] A study done by Peter M. Glaze of a periodontal department in Royal dental hospital of London showed that as tooth brushes aged, they became less effective in removing plaque.[19] In an another study done by Rayia Jasim AL-Naimi, reached similar conclusions, confirming that tooth brush wear is related to its ability to remove plaque.[20]

The association between Bleeding from gums and Type of brush was found to be statistically significant (P= 0.018). A majority, as Table 3 shows, had bleeding gums and were miswak users (41.18%) while the rest of the results are detailed in the table. Another study done by Douglas Romitti in 2021 showed that 58.8% of participants reported gingival soreness or bleeding with medium brushes.[21] Hence, we can conclude that a miswak or a hard brush would have equal if not a greater effect on the gingiva.

In our study, the association between Bleeding gums and perceived halitosis was found to be statistically significant P=0.000. Similar results were found in a study done in Sri Lanka where reported self-perceived halitosis was noted to be 18%, while halitosis was found to be significantly associated with bleeding gums.[22] And in Iran, where bleeding gums was one of the factors among many found to be associated with halitosis.[23]

An association between halitosis and how often the toothbrush was replaced was found to be statistically significant (P=0.022). A study done in Tanzania Africa showed the same results, where self-reported halitosis was higher among those who did not change their toothbrush for 4 months compared to those that used it for three months or less.[24]

In our study, we found no statistically significant association between level of education and oral health, which is in contrast to a study done by Paulander J in 2003 which showed that Educational level was shown to influence the oral conditions.[25] Robert A. Hahn in 2015 made the same association between education and health in general.[26] This could be explained by a study done in Norway which showed that Muslim religiosity was positively associated with positive health outcomes[27] as for a Muslim hygiene maintenance is a religious obligation.

5. Conclusion

The people of Pishtakhara Bala had a poor oral health status and while a part of the population practices oral hygiene maintenance, more than half of the population had bleeding gums and halitosis. The recommended proper oral hygiene habits were observed by only a small part of the population such as changing toothbrush on time, mouth wash, flossing, brushing technique, type of brush while the majority showed improper oral hygiene habits and aptitude that may prove to be detrimental to their health.

6. Conflict of Interest

None.

7. Source of Funding

None.

References

1. Petersen PE. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century–the approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol*. 2003;(31 Suppl 1):13–23. doi:10.1046/j..2003.com122.x.
2. Marcenes W, Kassebaum NJ, Bernabé E, Flaxman A, Naghavi <, Lopez A, et al. Global Burden of Oral Conditions in1990-2010. A Systematic Analysis. *J Dent Res*. 2013;92(7):592–7. doi:10.1177/0022034513490168.
3. Haag DG, Peres KG, Balasubramanian M, Brennan DS. Oral Conditions and Health-Related Quality of Life: A Systematic Review. *J Dent Res*. 2017;96(8):864–74. doi:10.1177/0022034517709737.
4. Alufohai OO, Taiwo JO, Sani B. Oral hygiene status and dental awareness of non-dental health professionals in Aminu Kano Teaching Hospital. *Nigerian J Basic Clin Sci*. 2019;16(2):121–6. doi:10.4103/njbcs.njbcs_3_19.
5. Bhuiyan M, Anwar HB, Anwar RB, Ali MN, Agrawal P. Oral hygiene awareness and practices among a sample of primary school children in rural Bangladesh. *Dentistry journal*. 2020;8(2):36. doi:10.3390/dj8020036.
6. Thanakanjanaphakdee W, Laohasiriwong W, Puttanapong N. Spatial distribution of dentists in Thailand. *J Int Oral Health*. 2019;11(6):340–6. doi:10.4103/jioh.jioh_138_19.
7. Area population density and urban rural proportion. (Accessed on 22-9-2021). Available from: http://111.68.102.42:8080/xmlui/bitstream/handle/123456789/13688/AREA%20POPULATION%20DENSITY%20AND%20URBAN%20RURAL%20PROPORTION.pdf?sequence=1&isAllowed=y.
8. Mbawalla SH, Masalu RJ, Astrom NA. Socio-demographic and behavioral correlates of oral hygiene status and oral health related quality of life, the Limpopo@ - Arusha school health project(LASH): A cross-sectional study. *BMC Pediatr*. 2010;10:87. doi:10.1186/1471-2431-10-87.
9. World Health Organization.(2003). Oral health promotion: an essential element of a health-promoting school. World Health Organization. Available from: https://apps.who.int/iris/handle/10665/70207?show=full.

10. Devi BV, Ganapathy D, Selvaraj A. Knowledge, awareness, and practice on brushing habits among adolescents in rural areas (Kanchipuram district). *Drug Invention Today*. 2019;11(2):286–9.
11. Rooney NJ, Wonham KL, Mcindoe KS, Casey RA, Blackwell EJ, Browne WJ, et al. Weekly and Daily Tooth Brushing by Care Staff Reduces Gingivitis and Calculus in Racing Greyhounds. *Animals*. 2021;11(7):1869. doi:10.3390/ani11071869.
12. Khamrco TY. Epidemiological study on prevalence of plaque and gingivitis among adolescents and adult population (15-54) years in Hamam-Allel villages, Ninevah, Iraq. *Al-Rafidain Dent J*. 2020;1(3):283–90.
13. Shaheen RS, Aldosari MM, Altuwaijri HA, Arnous FT, Alamro AA, Almarshedi RA, et al. Efficiency of Flossing Technique Application among Dental Students at Riyadh Elm University, Riyadh, Kingdom of Saudi Arabia. *J Oral Health Comm Dent* . 2019;13(3):64–8. doi:10.5005/jp-journals-10062-0051.
14. Boyle P, Koechlin A, Autier P. Mouthwash use and the prevention of plaque, gingivitis and caries. *Oral Dis*. 2014;20:1–68. doi:10.1111/odi.12187.
15. Winnier JJ, Rupesh S, Nayak UA, Reddy V, Rao AP. The comparative evaluation of the effects of tongue cleaning on existing plaque levels in children. *Int J Clin Pediatr Dent*. 2013;6(3):188–92.
16. Deolia SG, Kela KS, Sawhney IM, Sonavane PA, Nimbulkar G, Reche A, et al. Evaluation of oral health care seeking behavior in rural population of central India. *J Family Med Prim Care*. 2020;9(2):886–91. doi:10.4103/jfmpc.jfmpc_990_19.
17. Kim J, Kim DA, Kim HS, Baik JY, Ju SH, Kim SH, et al. Analysis of Microbial Contamination and Antibacterial Effect Associated with Toothbrushes. *J Dent Hygiene Sci*. 2018;18(5):296–304. doi:10.17135/jdhs.2018.18.5.296.
18. Twumwaa H, Asumang B, Imoro ZA, Kpordze SW. Toothbrush And Towel Handling And Their Microbial Quality: The Case Of Students Of University For Development Studies. *Afr J Infect Dis*. 2020;15(1):41–6. doi:10.21010/ajid.v15i1.5.
19. Glaze PM, Wade AB. Toothbrush age and wear as it relates to plaque control. *J Clin Periodontol*. 1986;13(1):52–6. doi:10.1111/j.1600-051x.1986.tb01414.x.
20. Al-Naimi R. Evaluation of Toothbrush Wear on Toothbrushing Efficiency. *Al-Rafidain Dent J*. 2009;9(1):51–6. doi:10.33899/rden.2009.9000.
21. Romitti D, Fagundes AV, Angst PDM, Gomes M, Gomes SC, Oppermann RV, et al. The use of medium bristle toothbrushes is associated with the incidence of gingival fissures. *Clin Oral Investig*. 2021;26(2):1657–66. doi:10.1007/s00784-021-04138-6.
22. Tormeti D, Blankson PK, Atinkah S, Sackeyfio J, Dai-Kosi A, Ayettey-Adamafio M, et al. Self-Perceived Halitosis in La, a Suburb of Accra, Ghana. *West Afr J Med*. 2021;38(2):120–4.
23. Ziaei N, Hosseinpour S, Nazari H, Rezaei M. Halitosis And Its Associated Factors Among Kermanshah High School Students (2015). *Clin Cosmet Investig Dent*. 2019;11:327–38. doi:10.2147/CCIDE.S215869.
24. Kayombo CM, Mumghamba EG. Self-Reported Halitosis in relation to Oral Hygiene Practices, Oral Health Status, General Health Problems, and Multifactorial Characteristics among Workers in Ilala and Temeke Municipals. *Int J Dent*. 2017;doi:10.1155/2017/8682010.
25. Paulander J, Axelsson P, Lindhe J. Association between level of education and oral health status in 35-, 50-, 65- and 75-year-olds. *J Clin Periodontol*. 2003;30(8):697–704. doi:10.1034/j.1600-051x.2003.00357.x.
26. Hahn RA, Truman BI. Education Improves Public Health and Promotes Health Equity. *Int J Health Serv*. 2015;45(4):657–78. doi:10.1177/0020731415585986.
27. Ishaq B, Østby L, Johannessen A. Muslim religiosity and health outcomes: A cross-sectional study among muslims in Norway. *SSM Popul Health*. 2021;15:100843. doi:10.1016/j.ssmph.2021.100843.

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