

KNOWLEDGE AND AWARENESS ABOUT ORAL HEALTH AMONG THE GENERAL POPULATION- AN ONLINE- BASED QUESTIONNAIRE STUDY

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ABSTRACT

Background of the study: Effective and efficient oral hygiene practices are essential for maintaining proper oral health to enhance the integrity of general health and overall quality of life that are largely influenced by knowledge and awareness towards oral health, oral health care regimens, personal attitude, beliefs and negligence due to inadequate information concerning health care practices.

Aim: The present study was aimed to assess the knowledge among the general population on oral health and also to evaluate the existing awareness on oral hygiene practices, their significance, and associated health concerns.

Methodology: A cross-sectional online-based questionnaire survey was carried out among the general population across Chennai city, Tamilnadu using Google forms distributed through various social media platforms. The scores were calculated based on responses, and statistical analysis was performed with SPSS (Statistical Package for the Social Sciences) statistics Version 24.0, using Student's t-test.

Results: Two-thirds of the respondents were aware that poor oral hygiene practices can cause bleeding gums (59.1%), swollen gums (52.9%), systemic problems (74%), associated with tooth loss (66%), and believe treating oral problems will reduce systemic conditions and other related complications (69%). Conversely, one-third of the study participants were not familiar with the proper use of toothbrushes (43.7%), and mouthwash (28.75%), the role of systemic diseases and oral health (25.8%) among which 19.5% with predominant gingival problems neither visit dental professionals nor agree with oral health-systemic disease management while 37.5% had never undergone scaling or any periodontal therapy in their lifetime.

Conclusion: Despite two-thirds of the study participants being aware of oral health and its significance based on their personal experience the present study clearly shows the lack of knowledge about the proper use of oral hygiene aids, the role of systemic

diseases and oral health, and various periodontal therapy options currently available to establish healthy gingiva. Thus, this study clearly emphasizes the need for more aggressive programs to raise awareness of oral health in the context of general health, provide resources for oral health promotion, and organize propaganda through various social media platforms on oral health among the general population.

KEY WORDS:

Bad Breath, Dental Professionals, Oral Hygiene Practices, Scaling, Toothpaste.

INTRODUCTION

Oral and Dental health is the fundamental physiological, functional, aesthetic, structural, and psychological state of well-being and integral component of overall health of an individual [1]. Compromised oral health results in gingival and periodontal diseases, oral pain, and dental decay with subsequent tooth loss thus affecting the masticatory functions (biting, chewing, grinding), phonetics, aesthetics and psychosocial wellness is one of the major public health concerns in developing countries like India owing to their higher prevalence, severity and associated elements [2-4]. The possible etiological factors leading to these oral diseases are poor oral hygiene behavioral practices, genetic predispositions, developmental problems, and traumatic instances [4, 5].

Oral hygiene or self-care practices that includes tooth brushing with fluoridated toothpaste more than once a day, appropriate use of mouthwashes, lesser consumption of sugar containing food products, avoiding consumption of alcohol and tobacco related substances along with regular dental checkups by visiting dentist at least once in a year are essential for maintaining proper oral health [6, 7]. Over the years studies by Casamassimo PS et al [8], De Silva AM et al [9], Griffin MC [10] and Lawrence HP et al [11] showed an intense reduction in prevalence of gingival diseases and dental caries

in children and adolescents among developed countries due to healthy lifestyle implementation, effective use of preventive fluorides, enhanced self-care practices and incorporation of preventive oral care programs. These findings suggests that oral hygiene self-care or behavioral practice changes are largely influenced by knowledge and awareness towards oral health, oral health care regimens, personal attitude, beliefs and role of negligence due to inadequate information concerning health care practices.

Studies by Kapoor D et al [4], Bhat PK et al [12], Patil AV et al [13], Jyothi S and Subha M [14], Jagan P et al [15] and Abu-Gharbieh E et al [16] also established a strong association between knowledge, literacy and improved oral health among the general population. Mahore RK et al [1], Gundala R [17], and Gautam N et al [18] observed factors such as diet and health, accessibility to dental care, unhealthy life-style differences seen between urban and rural population also play a significant role in overall oral health outcome. Studies by Mahore RK et al [1], Sharda A et al [2], Penmetsa GS et al [7] and Jain N et al [19] revealed strong correlation between poor oral health and systemic diseases such as cardiovascular diseases, diabetes, hypertension, stroke, preterm low birth weight, and premature delivery. Despite several studies being carried out from time to time, evidence-based reports still reveals a majority of the population in South East Asia region including India are unaware of oral hygiene practices, their significance, and associated health concerns.

From the above observations, it is clearly apparent that general health includes good oral hygiene practices with appropriate measures to ensure preservation of a healthy oral environment. Conversely, establishment of a healthy oral environment plays an important role in maintaining the integrity of general health and the overall quality of life. The assessment of available information and facilities, attitude, and practices is very important for

the endowment of proper health-care facilities as they form the standard model for the strategic planning and decision-making. Hence, it is necessary for all health care providers to create awareness among the general population and also to educate and promote health by incorporating a brief knowledge on the significance of oral health in improving the overall quality of life. Thus, the present study was aimed to assess the knowledge among the general population on oral health and also to evaluate the existing awareness of oral hygiene practices, their significance, and associated health concerns.

METHODOLOGY:

A cross-sectional online-based questionnaire assessment survey was performed amongst the general population across Chennai, Tamilnadu using Google forms distributed through various social media platforms to assess their knowledge on various aspects of oral health and also to evaluate the existing awareness on oral hygiene practices, their significance, and associated health concerns. After obtaining the Ethical clearance, the prerequisite information was collected and 25 relevant questions on oral health knowledge awareness were chosen based on the available literature. All the participants were informed about the purpose of the study and pre-filled online consents were obtained before the survey to ensure voluntary participation. The self-administered questionnaire evaluated among the study participants had specific questions with selected responses and Yes/ No/ don't know category-wise responses to few questions.

Statistical Analysis: Non-probability, random sampling method was preferred that yielded information from 240 individuals belonging to the general population category were taken into this cross-sectional observational study. Responses recorded were evaluated by performing a Student's t-test (p-value was set at <0.5 significance level) with SPSS (Statistical Package for the Social

Sciences V24.0 Illinois, Chicago) software Version 24.0. The internal consistency of the questionnaire was found to be adequate (Cronbach's alpha = 0.833).

Results: On analysis of the given data the mean age of the study population was observed as 27.133 ± 11.227 years (mean \pm S.D) with 1.427 at a 95% confidence level comprising of 96 (40%) male and 144 (60%) female participants. On the assessment of oral hygiene practices, only 52.5% of the study participants brush their teeth twice a day (morning and at night) while 43.7% prefer brushing only in the morning once (Q1). More than half of the respondents (57%) brush for about 2 minutes (Q3) among which 50.4% follow circular and 29.5% follow the horizontal method of tooth brushing (Q2). It was also observed that 55.4% changes brush 3 months once while 25.4% changes every month irrespectively (Q4).

On the evaluation of oral hygiene aids about 34.5% use sensitivity toothpaste, 31.25% use herbal toothpaste and 27.5% prefer whitening toothpaste (Q5) nonetheless 28.75% were unaware of the mouth rinse dilution before usage (Q6) while 40.8% urges to use toothpicks or any sharp materials rarely between the tooth surfaces (Q7). 59.1% were aware that poor oral hygiene practices, vitamin deficiencies (35%), and smoking (5%) cause gingival bleeding (Q9) similarly, 52.9% were familiar that poor oral health, aggressive brushing habits (27.5%), and inappropriate oral hygiene aids (13.75%) (Q11) can induce gingival changes such as swelling however 57.9% and 70% neither noticed bleeding (Q8) nor experienced swollen gingiva (Q10) in their routine oral hygiene practices respectively.

The majority of study participants visit dentists for gingival-related problems immediately (27.5%) or with severe pain (52.1%) (Q12) among which 74% were aware that systemic problems are related to oral health (Q13), factors associated with tooth loss (Q15) and 69% believe treating oral problems will

reduce systemic conditions (Q14). Conversely, 25.8% and 44.1% were not familiar with systemic complications and treatment of tooth loss (Q16) respectively while 19.5% with predominant gingival problems neither visit dental professionals nor agree with oral health-systemic disease management (31%).

56.25% had experienced bad breath rarely (Q17, Q18) among which 69.1% agree smoking can induce oral health-related problems like increased growth of disease-causing microorganisms (Q19). 40% of the respondents were not aware of various periodontal therapy options available (Q20, Q21), frequency of routine scaling (Q23), and treatment of gummy smile (Q25) while 37.5% had never undergone scaling or any periodontal therapy in their lifetime (Q12).

Discussion:

From the present study it was witnessed that preventive oral health knowledge, personal attitude and appropriate oral hygiene practice are the essential ways of keeping our oral environment healthy. It has been observed that oral hygiene remained as an unnoticed major social problem of significant health concerns. Majority of the people are unaware about the proper use of oral hygiene aids, the role of systemic diseases and oral health, and various periodontal therapy options currently available to establish healthy gingiva.

In the present study although tooth brushing with fluoridated tooth paste was the most commonly used oral hygiene cleaning aid, only 52.5% of the study participants brush their teeth twice a day whereas 43.7% prefer brushing only in the morning once similar to studies by Gautham N et al (75%) [18], Jiang et al (67%) [20], Al-Shammari et al (62%) [21], Dilip CL et al (58%) [22], Neha R Et al (51%) [23], Zhu L et al (50%) [24], National Oral Health Survey (NOHS) conducted in 2005 by the Indian Dental Association (IDA) (50%) [25], but slightly higher than studies by Singh D et al (40.7%)

[26], Dasgupta et al (35.7%) [27], Jyothi S and Subha M (37.62%) [14], Chugh A et al (30%) [28], Kapoor D et al (24.9%) [4], Jain N et al (23%) [19], Vinodha and Simon (18%) [29] and Kuppuswamy et al (17%) [30]. On further evaluation of nature of tooth paste preferred about 34.5% use sensitivity toothpaste, 31.25% use herbal toothpaste and 27.5% prefer whitening toothpaste similar to studies by Mahore RK et al [1], Kapoor D et al [4], Jyothi S and Subha M [14], Gautham N et al [18], and Singh D et al [26]. These contrasting outcomes of our study might be attributed to several factors such as study population, demographic location, educational and/or occupational status (Teachers, Medical professionals), availability of oral health services, attitude, beliefs at the individual and family levels, and influence of community-based educational programs by health professionals. Hence, several awareness programs focusing on these influencing factors has to be organized both at the community and individual level to increase the responsiveness among the general population thus contributing to enhanced oral hygiene practice.

More than half of the respondents (57%) brush for about 2 minutes using circular (50.4%) method similar to Kapoor D et al [4], Abu-Gharbieh E et al [16] and Neha R et al [23] while 29.5% follow the horizontal method of tooth brushing which is very less as compared to studies by Jyothi S and Subha M (79%) [14], Jain et al (75%) [19], Zhu L et al (60%) [24], and Singh et al (72%) [26]. About 28.75% were unaware of the mouth rinse dilution before usage which is in agreement with studies by Gautham N et al (63%) [18], Neha R et al (60%) [23], Faveri M et al (30%) [31], and Nagarajan S et al (29%) [32], whereas 40.8% urges to use toothpicks or any sharp materials rarely between the tooth surfaces comparatively higher than Kapoor D et al (6.9%) [4], Gautham N et al [18] and Jamjoom HM [33] results emphasizing the lack of proper information, awareness and attitude towards the use of proper cleaning technique, daily home oral hygiene

procedures and methods for maintaining proper oral hygiene in majority of the places. The above results enlightens the need for dental health care professionals to take further responsibilities to promote and disseminate appropriate information on ideal brushing techniques, and also on the importance of auxiliary oral hygiene aids among the general population by adequate counselling and active community participation.

Majority of the study population were not aware of frequency, ideal time and importance of changing tooth brush as several studies established a direct relationship between brushing frequency, technique, stiffness of bristles, and duration of changing toothbrush with gingival health and recommends replacement of tooth brush as the bristles become frayed every 2 months to prevent local irritation, inflammation and avoid abrasive effect on gingival tissue [25- 31]. It is notable that in our study about 55.4% changes brush 3 months once while 25.4% changes every month irrespectively as a routine habit which more or less coincides with studies by Gautham N et al (57%) [18], Neha R et al (39%) [23], Zhu L (30%) [24], Jyothi S and Subha M (28.71%) [14], Yadav et al [34], Borcic et al [35], and Masato et al [36]. Thus suggesting the necessity to alter habitual practice by proposing and implementing appropriate tooth brush usage/replacement guidelines and impart familiarity towards direct effect on occurrence of abrasion and duration of tooth brush usage.

About 59.1% were aware that poor oral hygiene practices, vitamin deficiencies (35%), and smoking (5%) cause gingival bleeding similarly, 52.9% were familiar that poor oral health, aggressive brushing habits (27.5%), and inappropriate oral hygiene aids (13.75%) can induce gingival changes such as swelling however 57.9% and 70% neither noticed bleeding nor experienced swollen gingiva in their routine oral hygiene practices respectively. Studies by Jyothi S and Subha M et al [14], Gautham N et al [18], Gilbert et al [37], and Buhlin et al [38]

showed participants with self-reporting on swollen or bleeding gums were familiar with impact of irregular brushing, faulty brushing techniques, and aggressive brushing habits whereas Tervonen T et al [39], Kallio P et al [40], and Lang P et al [41] showed failure to notice bleeding nor swollen gingiva in their routine is correlated with lack of attitude, negligence, inappropriate awareness, and poor oral health counselling provided.

The majority of study participants visit dentists for gingival-related problems immediately (27.5%) or only with severe pain (52.1%) which is similar to the study done by Jyothi S and Subha M (76.23%) [14], Kapoor D et al (75%) [4], Gundala R [17], Gautham N et al (56%) [18], Jain N et al (54%) [19], Mahore RK et al (54%) [1] and Sohi RK et al [42]. Several authors argued that in a developing country like India due to lack of appropriate dental financial support network such as dental insurance, third party payment schemes may explain the reason where participants reported visiting a dentist only when they have severe pain or in need of specific treatment and reduced dental visits. These results highlights the need for better financial management by incorporating payout schemes to ease the cost burden along with addressing financial plan requirement so that the general population would be largely benefited.

About 74% were aware that systemic problems are related to oral health, factors associated with tooth loss and 69% believe treating oral problems will reduce systemic conditions. Studies by Mahore RK et al [1], Bhat PK et al [12], Patil AV et al (70%) [13], Abu-Gharbieh E et al [16], Gautam N et al [18], Chugh A et al [28], and Bhatia A et al [43] also showed better awareness among teachers, medical professionals (higher education levels) in their respective studies whereas significant scarcity of education training and dissemination of information regarding the factors seen among general population largely influences their oral health behavioral practices.

Conversely, 25.8% and 44.1% were not familiar with systemic complications and treatment of tooth loss respectively which is slightly lower than Kapoor D et al (56.8%) [4], Abu-Gharbieh E et al [16], Bhatia A et al [43] while one-thirds of the population with predominant gingival problems neither visit dental professionals nor agree with oral health-systemic disease management as previously shown in studies by Kapoor D et al (75%) [4], Abu-Gharbieh E et al [16], Gundala R [17], Gautham N et al (56%) [18], and Jain N et al (54%) [19], where authors claimed that majority of the population didn't even sense the need for oral health check-up by visiting a nearby dentist every 6 months once on a routine basis. It can be postulated that at every individual and family levels, every opportunity had to be utilized by family physicians and primary care physicians to impart oral health education and its relationship with systemic diseases and overall health status of an individual during their routine general health check-up through oral screening, early diagnosis and prevention of common oral and dental diseases and its associated complications.

It was found that 56.25% had experienced bad breath rarely among which 69.1% agree smoking can induce oral health-related problems like increased growth of disease-causing microorganisms. Similar results were noted by Jani N et al (80%) [19], Jyothi S and Subha M (55%) [14], Kapoor D et al (47.2%) [4], Chugh A et al [28] and contrast to studies by Mahore RK et al (30%) [1], Bhat PK et al [12], Bhatia A et al [43] and Dayakar et al [44] indicating lack of interest and popularity towards bad breath despite adequate knowledge. It was also anticipated that majority of people clean their tongue with scraper, avoid food substances causing unpleasant odor to reduce halitosis as a part of daily home oral hygiene procedure.

More than one-third of the respondents (40%) were not aware of various periodontal therapy options available, frequency of routine scaling, and

treatment of gummy smile while 37.5% had never undergone scaling or any periodontal therapy in their lifetime. Similar studies by Bhat PK et al [12], Gundala R et al [17], Dilip CL et al [21], Tervonen et al [39], Bhatia A et al [43] and Dayakar et al [44] claim that this mindset of not visiting dentist for regular checkup frequently and performing oral prophylaxis that includes oral health counselling, scaling may be due to a fear towards dental treatment, personal bad experience and family sources, uneventful past experience, lack of awareness and emphasis on oral health treatment modalities currently available and also correlated with the generalized view that oral hygiene is a discrete entity from overall health among the general population. Thus, these factors that influence the dental treatment and overall oral hygiene need to be addressed by the community dental professionals through integrated active oral health practice and implementation of the same under their supervision among general population at the community level.

CONCLUSION: Within the limitations, the present study clearly shows the lack of knowledge about the proper use of oral hygiene aids, the role of systemic diseases and oral health, and various periodontal therapy options currently available to establish healthy gingiva despite two-thirds of the study participants being aware of oral health and its significance based on their personal experience. Thus, this study clearly emphasizes the need for more aggressive programs to raise awareness of oral health in the context of general health, introduce oral health education sessions, and oral health counseling, provide resources for oral health promotion at the community level and organize propaganda through mass media and several social media platforms on the importance of oral health and oral hygiene practices among the general population.

REFERENCE:

1. Mahore RK, Gupta V, Panika RK. Assessment of knowledge, attitude, and practices regarding oral and dental hygiene among dental outpatients in Central India: A cross-sectional study. *J Sci Soc* 2021; 48:73-8.
2. Sharda A, Sharda J. Factors influencing choice of oral hygiene products used among the population of Udaipur, India. *Int J Dent Clin* 2010; 2:7-12.
3. Butt AM, Ahmed B, Parveen N, Yazdanie N. Oral Health related quality of life in complete dentures. *Pak Oral Dent J*. 2009; 29:397–402.
4. Kapoor D, Gill S, Singh A, Kaur I, Kapoor P. Oral hygiene awareness and practice amongst patients visiting the Department of Periodontology at a Dental College and Hospital in North India. *Indian journal of dentistry*. 2014 Apr; 5(2):64.
5. Tatakis DN, Kumar PS. Etiology and pathogenesis of periodontal diseases. *Dental Clinics*. 2005 Jul 1; 49(3):491-516.
6. Gopinath V. Oral hygiene practices and habits among dental professionals in Chennai. *Indian Journal of Dental Research*. 2010 Apr 1; 21(2):195.
7. Penmetsa GS, Meghana K, Bhavana P, Venkatalakshmi M, Bypalli V, Lakshmi B. Awareness, attitude and knowledge regarding oral health among pregnant women: A comparative study. *Nigerian medical journal: journal of the Nigeria Medical Association*. 2018 Nov; 59(6):70.
8. Casamassimo PS, Lee JY, Marazita ML, Milgrom P, Chi DL, Divaris K. Improving children's oral health: an interdisciplinary research framework. *Journal of dental research*. 2014 Oct; 93(10):938-42.
9. De Silva AM, Martin-Kerry JM, McKee K, Cole D. Caries and periodontal disease in Indigenous adults in Australia: a case of limited and non-contemporary data. *Australian Health Review*. 2016 Aug 29; 41(4):469-78.
10. Griffin MC. Biocultural implications of oral pathology in an ancient Central California population. *American Journal of Physical Anthropology*. 2014 Jun; 154(2):171-88.
11. Lawrence HP, Binguis D, Douglas J, McKeown L, Switzer B, Figueiredo R, Reade M. Oral health inequalities between young Aboriginal and non-Aboriginal children living in Ontario, Canada. *Community dentistry and oral epidemiology*. 2009 Dec; 37(6):495-508.
12. Bhat PK, Kumar A. Preventive oral health knowledge, practice and behaviour of patients attending dental institution in Bangalore, India. *Journal of International Oral Health*. 2010 Aug 1; 2(2).
13. Patil AV, Somasundaram KV, Goyal RC. Current health scenario in rural India. *Australian Journal of Rural Health*. 2002 Apr; 10(2):129-35.
14. Jyothi. S, Subha. M. Oral Health Awareness among the General Population in Chennai. *Research J. Pharm. and Tech* 2017; 10(11): 3873-3876.
15. Jagan P, Fareed N, Battur H, Khanagar S, Manohar B. Conceptual knowledge of oral health among school teachers in South India, India. *European journal of dentistry*. 2018 Jan; 12(01):043-8.
16. Abu-Gharbieh E, Saddik B, El-Faramawi M, Hamidi S, Basheti M. Oral health knowledge and behavior among adults in the United Arab Emirates. *BioMed research international*. 2019 Oct; 2019.
17. Gundala R, Chava VK. Effect of lifestyle, education and socioeconomic status on periodontal health. *Contemporary clinical dentistry*. 2010 Jan; 1(1):23.
18. Gautam N, Shivalingesh KK, Jungio MP, Abbey P. Assessment of knowledge and awareness of oral health in rural and urban school teachers in Bareilly city: A cross-sectional study. *International Journal of Oral and Craniofacial Science*. 2022 Mar 28; 8(1):010-4.

19. Jain N, Mitra D, Ashok KP, Dundappa J, Soni S, Ahmed S. Oral hygiene-awareness and practice among patients attending OPD at Vyas Dental College and Hospital, Jodhpur. *Journal of Indian Society of Periodontology*. 2012 Oct; 16(4):524.
20. Jiang H, Petersen PE, Peng B, Tai B, Bian Z. Self-assessed dental health, oral health practices, and general health behaviors in Chinese urban adolescents. *Acta Odontol Scand* 2005; 63:343-52.
21. Al-Shammari KF, Al-Ansari JM, Al-Khabbaz AK, Dashti A, Honkala EJ. Self-reported oral hygiene habits and oral health problems of Kuwaiti adults. *Med PrincPract* 2007; 16:15-21.
22. Dilip CL. Health status, treatment requirements, knowledge and attitude towards oral health of police recruits in Karnataka. *J Indian Assoc Public Health Dent* 2005; 5:20-34.
23. Neha R. Knowledge and awareness of oral hygiene among general population-a survey. *NVEO-Natural Volatiles & Essential Oils Journal: NVEO*: 2021; 11:7103-26.
24. Zhu L, Petersen PE, Wang HY, Bian JY, Zhang BX. Oral health knowledge, attitudes and behaviour of adults in China. *Int Dent. J* 2005; 55:231-41.
25. Indian Dental Association. National oral health program. Bombay Mutual Terrace, 2012. Available from: <http://www.nohp.org.in/aboutus/NOHP.aspx>
26. Singh D, Tiwari VK, Raj S. Knowledge awareness and practice regarding oral hygiene and its consequences among dental patient attending OPD in tertiary care hospital in Delhi. *IOSR J Dent Med Sci* 2018; 17:7-16.
27. Dasgupta U, Mallik S, Naskar S, Choudhury K, Paria B, Bhattacharya SK. Dental problems and its epidemiological factors: A study on adolescent and adult patients attending dental OPD of a tertiary care hospital in Kolkata, India. *J Dent Med Sci* 2013; 5:1-7.
28. Chugh A, Rastogi R, Choudhary A, Singh S, Chugh VK, Patnana AK. Knowledge, awareness and attitude of oral health and root canal treatment among medical professionals. *J Global Oral Health* 2019; 2(1):41-7.
29. Vinodha C, Simon AK. Awareness of oral hygiene among patients attending dental outpatient department in a tertiary hospital in Coimbatore: A cross sectional study. *PARIPEX Indian J Res* 2019; 8:36-9.
30. Kuppuswamy VL, Murthy S, Sharma S, Surapaneni KM, Grover A, Joshi A. Oral hygiene status, knowledge, perceptions and practices among school settings in rural South India. *Oral Health Dent Manag* 2014; 13:146-54.
31. Faveri M, Hayacibara MF, Cancine Pupio G, Cury JA, Ota Tsuzuki C, Hayacibara RM. A cross-over study on the effect of various therapeutic approaches to morning breath odour. *Journal of clinical periodontology*. 2006 Aug; 33(8):555-60.
32. Nagarajan S, Pushpanjali K. Self-assessed and clinically diagnosed periodontal health status among patients visiting the outpatient department of a dental school in Bangalore, India. *Indian Journal of Dental Research*. 2008 Jul 1; 19(3):243.
33. Jamjoom HM. Preventive oral health knowledge and practice in Jeddah, Saudi Arabia. *Journal of King Abdulaziz University-Medical Sciences*. 2001 Jan 1; 9:17-25.
34. Yadav NS, Saxena V, Reddy R, Deshpande N, Deshpande A, Kovvuru SK. Alliance of oral hygiene practices and abrasion among urban and rural residents of Central India. *J Contemp Dent Pract* 2012; 13:55-60.
35. Borcic J, Anic I, Urek MM, Ferreri S. The prevalence of non-carious cervical lesions in permanent dentition. *J Oral Rehabil* 2004; 31:117-23.
36. Masato H, Hiroto K, Tamenari E, Shoichi I, Akira S. Influences of brushing force on

-
- toothbrush abrasion of human dentin. *J Gifu Dent Soc* 2012; 38:129-34.
37. Gilbert AD, Nuttall NM. Self-reporting of periodontal health status. *British dental journal*. 1999 Mar; 186(5):241-4.
38. Buhlin K, Gustaffon A, Anderson K, Hakansson K, Klinge B. Validity and limitations of selfreported periodontal health. *Community Dent Oral Epidemiol* 2002; 30:431-7.
39. Tervonen T, Knuttila M. Awareness of dental disorders and discrepancy between objective and subjective dental treatment needs. *Community Dent Oral Epidemiol* 1988; 34:345-8.
40. Kallio P, Nordblad A, Croucher R, Ainamo J. Self-reported gingivitis and bleeding gums among adolescents in Helsinki. *Community Dent Oral Epidemiol* 1994; 22:277-82.
41. Lang P, Woolfolk MW, Faja BW. Oral Health Knowledge and Attitudes of Elementary School teachers in Michigan. *J Public Health Dent* 1989; 49: 44-50.
42. Sohi RK, Sandhu KS, Kushwah PS, Sharma S, Dhaliwal AK. Knowledge, attitude, and practices regarding oral health among patients visiting dental OPD at Sri Sukhmani Dental College and Hospital, Dera Bassi, Punjab. *Int J Health Res Educ* 2018; 1:1-5.
43. Bhatia A, Bains SK, Singh MP. To assess knowledge and awareness of North Indian population towards periodontal therapy and oral-systemic disease link: A cross-sectional survey. *J Interdiscip Dentistry* 2013; 3:79-85.
44. Dayakar MM, Kumar J, Pai GP, Shivananda H, Rekha R. A survey about awareness of periodontal health among the students of professional colleges in Dakshina Kannada District. *J Indian Soc Periodontol* 2016; 20:67-71.