



Assessment of among young adult, middle aged adults, and geriatric patient in Bhubaneswar city

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Abstract

The aim of the study is to assess the oral hygiene status among the young, middle aged and geriatric patients in Bhubaneswar, Odisha. A cross-sectional questionnaire survey was done among the 30 participants, who ranged in age from 18 to 70. Written informed consent was obtained. Plaque index, gingival index, and the simplified oral hygiene index were used in the clinical examination. The analysis was performed using SPSS Statistics for Windows, version 26.0. Plaque index was low in the 18–30 age group in 40.9%. For 40% of the study participants, the oral hygiene index was fair, and for 62.5%, the gingival index was mild. In the age category of 51 to 70 years, 37.5% had high plaque indexes and 60% had moderate gingival indices. Statistical significance was found with OHI-S and gingival index ($p=0.015, 0.0001$). Positive correlation was seen between gingival and plaque index. The plaque index was low for most of the study participants. The majority of the study participants' gingival and oral hygiene scores were determined to be mild to fair.

Keywords: oral health, oral hygiene, plaque index, gingival index, geriatric

Full-length article

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1. Introduction

In terms of general health and well-being across the lifespan, oral hygiene is crucial. The importance of maintaining good oral health transcends age, as it directly impacts one's ability to eat, speak, and maintain social confidence. India, with its diverse population and varying healthcare resources, presents a unique context to study oral hygiene practices among young adults, middle-aged adults, and geriatric adults [1]. Understanding the oral health landscape in India is essential, given the country's demographic diversity and healthcare disparities. With an aging population, the impact of oral health on the elderly becomes increasingly significant, but the oral hygiene practices of younger generations are equally important for long-term health outcomes [2].

This study will employ a multifaceted approach, encompassing surveys, dental examinations, and interviews, to collect comprehensive data on oral hygiene practices, oral diseases prevalence, oral care accessibility, and awareness among the target age groups. The results of this study will not only offer insightful information about the state of dental hygiene, but they will also lay the groundwork for specialised treatments aimed at enhancing oral health outcomes for people of all ages. In a country where traditional practices often intersect with modern healthcare, this study seeks to bridge the gap between oral hygiene

knowledge, practices, and policy implementation, ultimately contributing to the overall well-being of India's diverse population [3]. Hence, this study aims to delve into the oral hygiene behaviours among these three distinct age groups in Bhubaneswar, Odisha. By focusing on young adults, middle-aged adults, and geriatric adults, we intend to shed light on how oral health practices evolve across the lifespan and how they are influenced by factors such as cultural norms, socioeconomic status, and access to dental care.

2. Methodology

A cross-sectional questionnaire study between 6 May 2023 and 30 August 2023 was conducted among the general population belonging to various age groups and those who visited the dental OPD. The KIIT Ethics Committee, which is considered to be an academic body, independently examined and authorised the study before it was carried out. The study participants were chosen using a convenience sampling procedure, and those who provided verbal consent were included. To a total of 30 study participants, from 18 to 70 years of age, the questionnaire was made available. Before giving out the questionnaire, the study's objectives were conveyed to the study participants. Participants who did not give consent and less than 18 years of age were excluded from the study.

A group of five subject matter experts examined the validity of the questionnaire before the study started, and

any revisions that were required were made. The investigator and the helper were trained and calibrated by the guide at the Kalinga Institute of Dental Sciences' Department of Periodontics. It was discovered that the Cronbach's alpha value was 0.96, indicating extremely good reliability. Patients' dental plaque thickness was assessed using a periodontal probe on the mesial, distal, buccal, and palatal surfaces of all of their teeth in order to calculate their plaque index. An individual's plaque index was calculated by averaging the results received for each tooth and adding them up. The following reference values from Silness&Løe [4] were used to calculate the plaque index:

- Score 0: No plaque
- Score 1: Plaque in the form of a thin film on the gingival margin.
- Score 2: Visible plaque in the gingival pocket and gingival margin.
- Score 3: Dense plaque in the gingival pocket and on the gingival margin.

Williams periodontal probe was used to measure gingival bleeding on the mesial, distal, buccal, and palatal surfaces of all teeth in order to calculate the patients' gingival index. By averaging the numbers determined for each tooth and adding them up, the gingival index of an individual was determined. Løe&Silness standard values were used as a foundation to calculate the gingival index[5].

- Score 0: Healthy gums.
- Score 1: Mild discolouration and oedematous gingiva. No bleeding on probing.
- Score 2: Red, oedematous and shiny gingiva. There is bleeding on probing.
- Score 3: Red, oedematous and ulcerated gingiva. There is spontaneous bleeding.

Oral hygiene index simplified was used to determine the oral hygiene status by scoring debris and calculus accumulation in the mouth.

Debris Index

- Score 0 There are no stains or debris.
- Score 1 Extrinsic stains without any soft debris, regardless of the area covered, or the presence of soft debris covering no more than one-third of the tooth surface.
- Score 2 Soft debris that covers more than one-third but not more than two-thirds of the exposed tooth surface.
- Score 3 More than two-thirds of the exposed tooth surface covered in soft debris.

Calculus Index

- Score 0 - Calculus is not present.
- Score 1 - Supragingival calculus with a score of 1 that covers no more than one-third of the visible tooth surface.
- Score 2 - Individual specks of subgingival calculus surrounding the cervical region of the tooth or supragingival calculus encompassing more than 1/3 but not more than 2/3 of the visible tooth surface, or both.
- Score 3 - A continuous heavy band of subgingival calculus surrounding the cervical region of the tooth, encompassing more than two thirds of the visible tooth surface, or both.

The data were entered into an Excel spreadsheet and analysed with SPSS Statistics for Windows, version 26.0. Frequency and percentages were used to describe categorical variables. The Chi-square test was used to perform inferential statistics. To compare the means of the

gingival and plaque index scores, bivariate correlation was performed. 0.05 was used as the threshold for statistical significance.

3. Results

For the vast majority of research participants, the plaque index was low(Figure 1).The majority of the study participants' gingival and oral hygiene scores were determined to be mild to fair(Figure 2,3).Plaque index was low in the 18–30 age group in 40.9%.For 40% of the study participants, the oral hygiene index was fair, and for 62.5%, the gingival index was mild(Table 1).50% of the patients in the 31–50 age group had elevated plaque indices.In 37.5% of the respondents, the gingival index was modest, and 66.7% of the subjects had good oral hygiene.In the age category of 51 to 70 years, 37.5% had high plaque indexes and 60% had moderate gingival indices.Statistical significance was found with OHI-S and gingival index.($p=0.015,0.0001$) (Table1)Positive correlation was seen between gingival and plaque index(Table 2).

4. Discussion

Good oral hygiene is essential for preventing dental caries, gingivitis, and periodontitis since it is well known that regular removal of plaque biofilms is essential for preserving oral health. The most widely used technique to preserve good oral hygiene is mechanical plaque removal using a toothbrush that is manual since it is widely available, simple to use, and inexpensive. When performed properly and for the recommended period of time, manual tooth brushing is highly effective. The toothbrush is still the most efficient long-term way of eliminating dental plaque in children, despite the fact that how well they are able to use it varies substantially according to their years of age, specific dexterity, and motivation [6].

Not only kids, but it is equally crucial to maintain good oral hygiene among middle aged and geriatric patients. There are many studies which has evaluated the oral health status and oral hygiene status among different age groups and population [7-14]. The study population's average age was 46.75 years old.It is important to note a number of the study's standardised components. In whole-mouth clinical evaluations, the Turesky form of Quigley-Hein and the Løe-Silness Index, two extensively used techniques for evaluating oral hygiene, were applied. These indices are widely used as the benchmark for a full evaluation of the entire mouth when compared to partial mouth evaluations. A clinical examiner with 99% reliability in the clinical indices performed clinical examinations after being calibrated.

Residents in the surrounding area who were selected from the general population served as the study's subjects. Contrary to other research, there were no washout or preparation stages before the oral examination, and no oral hygiene instructions were given beforehand. To lessen the effects of these factors on dental plaque, subjects did not change their diet or daily routines.

Table 1: Oral hygiene status with age groups of study participants (n=30)

Plaque index	Age (in years)			Total n (%)	p value
	18-30 n (%)	31-50 n (%)	51-70 n (%)		
High	1(12.5)	4(50)	3(37.5)	8(100)	0.303
Low	9(40.9)	6(27.3)	7(31.8)	22(100)	
OHI-S					
Good	2(33.3)	4(66.7)	0(0)	6(100)	0.015*
Fair	8(40)	6(30)	6(30)	20(100)	
Poor	0(0)	0(0)	4(100)	4(100)	
Gingival index					
Mild	10(62.5)	6(37.5)	0(0)	16(100)	0.0001*
Moderate	0(0)	4(40)	6(60)	10(100)	
Severe	0(0)	0(0)	4(100)	4(100)	
Total	10(33.3)	10(33.3)	10(33.3)	30(100)	

*Significant

Table 2:

		Plaque index score	Gingival index score
Plaque index score	Pearson Correlation	1	.224
	Sig. (2-tailed)		.235
	N	30	30
Gingival index score	Pearson Correlation	.224	1
	Sig. (2-tailed)	.235	
	N	30	30

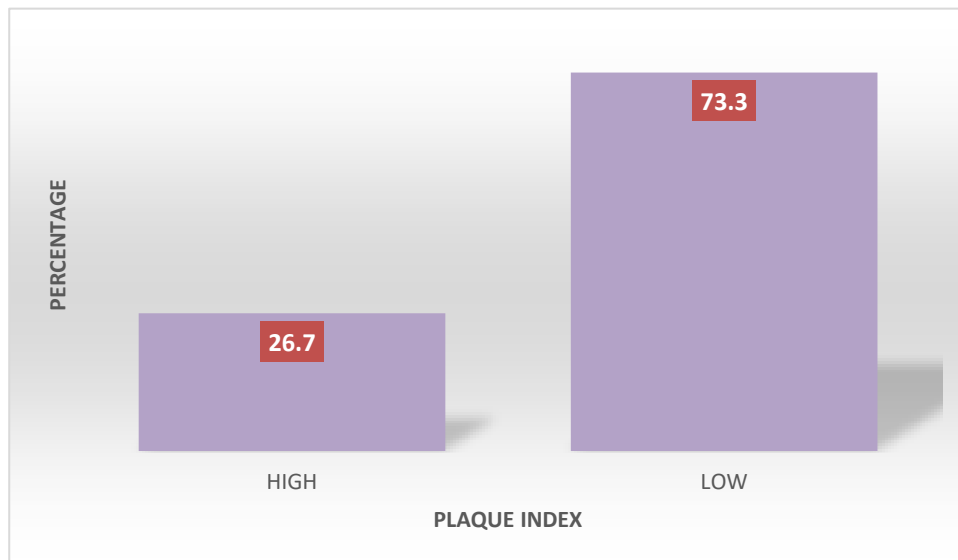


Figure 1: Plaque index among study participants

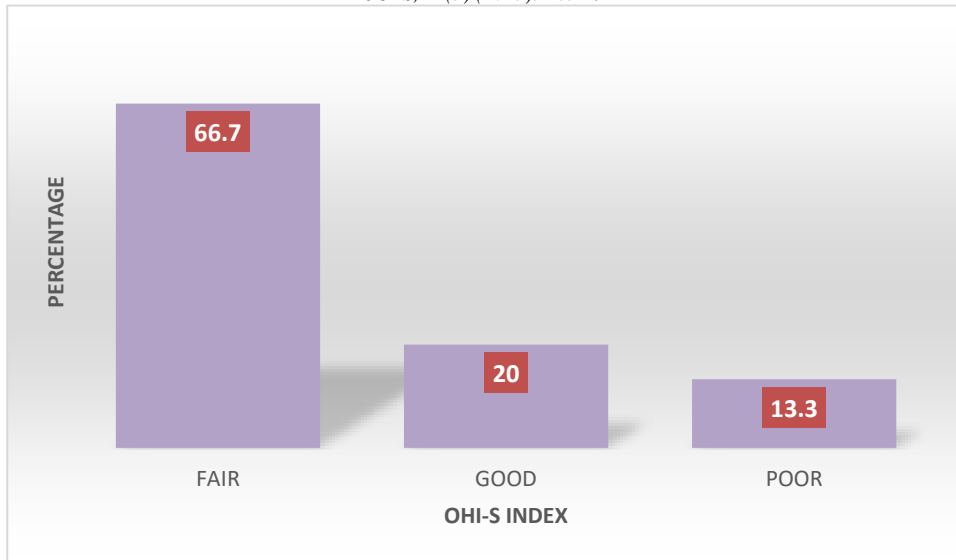


Figure 2: Oral hygiene index- simplified among study participants

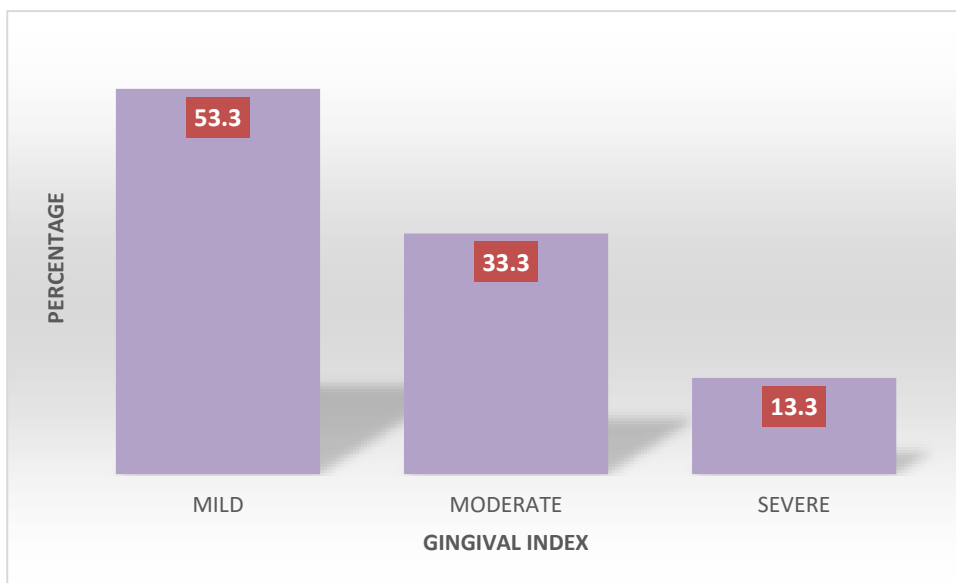


Figure 3: Gingival index among study participants

Although there were no racial or ethnic disparities in the population, there were variations in social standing and habitat. The demographic characteristics of the study participants revealed differences in dietary and cultural practices. In line with other findings indicate low utilisation of dental services. They only used dental services when experiencing pain or other crises. While there are still many crucial aspects, including affordability and accessibility to dental clinics, it is also critical to emphasise the importance of dental education. These findings taken together are significant since gingivitis and dental plaque are found in the mouth in a natural way with few affecting factors [15-17].

The study's key findings show that the average gingival and plaque scores for this sample were 2.47 and 1.19, respectively. The present analysis included data that are typically not reported, like as plaque frequency and gingival index scores. Dental plaque and gingivitis both had whole-mouth ratings of 2.4 and 1.2, respectively. These findings are in contrast to others that suggest female individuals have lower gingivitis scores, but they are similar to others that demonstrate a link and education. This study revealed that the study subjects had minor periodontal disease. In an effort to shed light on the level of oral healthcare in neighbouring areas, a different study assessed the periodontal health of people living in a fishing village near Accra. Poor periodontal health was prevalent in general, yet it was shown that this varied greatly according to the features of the community. According to that study, men's periodontal health is worse than women's [18]. This result was in line with research by Desvarieux et al. [19], and Levin et al. [20] where men had worse periodontal health than women.

According to several research in the literature, men are more likely than women to develop periodontal disease as a result of women's better dental hygiene practices [21]. As the sample size was very less, the results can not be generalised in the targeted population.

5. Conclusion

These findings emphasize the importance of whole-mouth exams from the perspective of preventative programs. Furthermore, regardless of age, these disparities point out the importance of maintaining good oral hygiene.

References

- [1] N.Ameer, R. Palaparthi, M. Neerudu, S.K.Palakuru, H.R.Singam, and S. Durvasula. (2012). Oral hygiene and periodontal status of teenagers with special needs in the district of Nalgonda India. *Journal of Indian Society of Periodontology*. 16:421-425.
- [2] P.K. Sreenivasan, K.V.V. Prasad, and S.B.Javali. (2016). Oral health practices and prevalence of dental plaque and gingivitis among Indian adults. *Clinical and Experimental Dental Research*. 2(1):6-17.
- [3] K.T.Ababneh, Z.M.A.Hwajj, and Y.S.Khader. (2012). Prevalence and risk indicators of gingivitis and periodontitis in a multi-centre study in North Jordan: A cross sectional study. *BMC Oral Health*. 12:1-6.
- [4] J. Löe, and H.Silness. (1964). Periodontal disease in pregnancy II. Correlation between oral hygiene and periodontal condition. *Acta odontologica Scandinavica*. 22 (1): 121-135.
- [5] J. Löe, and H. Silness. (1963). Periodontal disease in pregnancy I. Prevalence and severity. *Acta odontologica Scandinavica*. 21: 533-551.
- [6] P.D.Angst, F.B.Piccinin, R.V. Oppermann, R.A. Marcantonio, and S.C. Gomes. (2013). Response of molars and non-molars to a strict supragingival control in periodontal patients. *Brazilian Oral Research*. 27:55-60.
- [7] A.I.Otaibi, M.Al-Harthy, B.Söder, A.Gustafsson, and B.Angmar-Månsson. (2003). Comparative effect of chewing sticks and toothbrushing on plaque removal and gingival health. *Oral Health and Preventive Dentistry*. 1: 301-307.
- [8] N.Ameer, R. Palaparthi, M. Neerudu, S.K.Palakuru, H.R.Singam, and S.Durvasula. (2012). Oral hygiene and periodontal status of teenagers with special needs in the district of Nalgonda, India. *Journal of Indian Society of Periodontology*. 16: 421-425.
- [9] Australian Research Centre for Population Oral Health, The University of Adelaide, South Australia (2009). Periodontal diseases in the Australian adult population. *Australian Dental Journal*. 54: 390-393.
- [10] C.S.Bhagyajyothi, and K.Pushpanjali. (2011). Assessment and comparison of periodontal status among young smokers and nonsmokers of Bangalore, India—a cross sectional study. *Community Dental Health*. 28:89-94.
- [11] J.Bharateesh, M. Ahmed, and M. Kokilax. (2012). Diabetes and oral health: a case-control study. *International Journal of Preventive Medicine*. 3: 806-809.
- [12] G. Kumar, P. Dash, V. Suresan, A. Singh, R.K. Verma, and J. Patnaik. (2022). Assessment of Oral Health-Related Quality of Life among Kutia Kandha Tribes of Odisha. *Journal of Pharmacy and Bioallied Sciences*. 14(Suppl 1):S621-S625.
- [13] G. Kumar, M.Jalaluddin, and P.Dash. (2023 Jan-Apr). Assessment of oral health status among Bhoi community of Nimapara block in Puri district, Odisha: A cross-sectional study. *National Journal of Maxillofacial Surgery*. 14(1):119-124.
- [14] C.de. Oliveira, R. Watt, and M.Hamer. (2010). Toothbrushing, inflammation, and risk of cardiovascular disease: results from Scottish Health Survey. *British Medical Journal*. 340: c2451.
- [15] S.A.Dowsett, G.J.Eckert, and M.J.Kowoli. (2002). The applicability of half-mouth examination to periodontal disease assessment in untreated adult populations. *Journal of Periodontology*. 73:975-981
- [16] J.S. Ericsson, A.L. Östberg, J.L.Wennström, and K.H.Abrahamsson. (2012). Oral health-related perceptions, attitudes, and behavior in relation to oral hygiene conditions in an adolescent population. *European Journal of Oral Science*. 120: 335-341.
- [17] N.Jain, D.Mitra, K.P.Ashok, J.Dundappa, S.Soni, and S.Ahmed. (2012). Oral hygiene awareness and practice among patients attending OPD at Vyas Dental College and Hospital, Jodhpur. *Journal of Indian Society of Periodontology*. 16: 524-528.

- [18] S.Poudyal, A.Rao, R.Shenoy, H.Priya.(2010). Utilization of dental services in a field practice area in Mangalore, Karnataka. *Indian Journal of Community Medicine*. 35: 424–425.
- [19] L.P. De Mesquita,P.N. Lemos,L.B.Hirooka, S. Aparecida, C. Nunes,S.F. Mestriner et al. (2010). Periodontal status of an indigenous population at the Xingu Reserve. *Brazilian Journal of Oral Science*.9(1):43–47.
- [20] L.Levin, V. Margvelashvili, L. Bilder,M. Kalandadze, N. Tsintsadze, and E.E. Machtei. (2013). Periodontal status among adolescents in Georgia; A Pathfinder study. *Peer J*. 1:e137.
- [21] J. Paulander,P. Axelsson, and J. Lindhe. (2003). Association between level of education and oral health status in 35-, 50-, 65-and 75-year-olds. *Journal of Clinical Periodontology*. 30(8):697–704.