

Evaluation of North Indian People's Quality of Life During Fixed Dental Rehabilitation Using the World Dental Federation's Digital App

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Abstract

In keeping with the World Dental Federation's (FDI) goal of providing complete, evidence-based oral healthcare by 2030, a survey was carried out. The study's objective is to gather standardized nationwide data on the population's oral health requirements, care-seeking habits, and oral health-related quality of life. Dentists from both urban and rural India, as well as the patients who visited their offices, participated in this analytical cross-sectional study. Between December 2021 and January 2023, individuals seeking care at private oral healthcare clinics were surveyed using the digital application created by the FDI as part of the Oral Health Observatory (OHO) project. Using SPSS software, descriptive statistics, Chi square tests, and Mann-Whitney U tests were used to analyze the study data. The OHO app was used to gather information on the oral health seeking behavior and habits of 1000 patients (mean age 38.6 ± 12.1 years, 61% male, 39% female). Periodontal disease affected more than 80% of the patients. 51.5% of people went to the dentist in the previous year; time restrictions and the conviction that there was nothing wrong with their teeth are typical obstacles. There were high rates of daily tobacco usage (35%) and sugar intake (67%). The majority of dentists prioritized treatment above prevention. By supporting advocacy and being in line with FDI Vision 2030, this study offers crucial information on oral health in India and serves as a crucial first step in attaining universal health coverage for oral health.

Keywords: Oral health, practice patterns, surveillance

I. Introduction

Dental caries, periodontal disease, tooth loss, and oral malignancies are among the many common and debilitating oral disorders that impact 3.5 billion people worldwide, mostly in middle-income nations. The World Health Organization's worldwide Oral Health Status Report, 2022, emphasizes the urgent need for attention and recognizes that oral health is a major worldwide problem (WHO, 2022). Despite the enormous burden of oral disease, with an untreated caries prevalence of >40% and >30% in the deciduous and permanent dentition, respectively, India's annual dental expenditures per person were estimated to be less than \$1, which is among the lowest in the world (Global Oral Health Status Report, 2022).

The Dental Council of India conducted the country's first epidemiological oral health survey in 2002-03 (DCI, 2002), and the Ministry of Health and Family Welfare, in partnership with AIIMS, conducted a multicentric oral health survey in 2005 (Shah, 2007). These surveys yielded important information about the state of the country's oral health. But there hasn't been any national oral health surveillance since. An realistic image of the country's oral health condition is challenging to get due to the fragmented and insufficient nature of the current surveillance system, which is characterized by irregular and nonstandardized data collecting. There is a dearth of thorough data on the epidemiology of dental illnesses impacting the general community because the majority of studies that are currently accessible are either loco regional or hospital based (Sreela et al., 2019).

In order to gather information that supports political action to improve the delivery of oral healthcare, standardized data collection and the establishment of surveillance systems are essential (NICE, 2022). These systems enable customized interventions and effective resource allocation, particularly when the impact of poor oral health status on people's overall wellbeing and quality of life is appropriately prioritized. They also offer crucial insights into the prevalence, distribution, and trends of oral diseases. The World Dental Federation (FDI), which is dedicated to guaranteeing that everyone has access to oral healthcare, is pushing for the creation

of national oral health indicators that could easily be incorporated into the yearly surveys in order to achieve complete, evidence-based oral healthcare by 2030 (Vision, 2030).

To improve oral health data collecting and analysis worldwide, the FDI started the Oral Health Observatory (OHO) program in 2014 (Fernandez et al., 2016). The FDI and the Indian Dental Association (IDA) worked together to improve oral health surveillance at the national level in India. In light of this, the study's goals were to assess the dentition and periodontal status of patients visiting private dentists with an additional focus on care-seeking behaviors and oral health-related quality of life, as well as to gather standardized oral health data at the national level using the FDI's OHO digital application, which enables global comparisons.

II. Materials and Methods

In order to gather the data necessary for patient interviews and clinical oral examinations, this analytical cross-sectional survey used the FDI's OHO digital tool. Private practice dentists from both urban and rural parts of India were the survey's target respondents, and the IDA membership list served as the sample frame. Private practices were recruited for the study using nonprobability convenience sampling, and each participating dentist was requested to include the first patient seen on Monday, the second on Tuesday, the third on Wednesday, and so on. Following a clinical oral examination, willing participants were questioned about their quality of life, lifestyle choices, and dental appointments. The study excluded dentists and patients who refused to take part. The study has been approved by the Institutional Ethics Committee. Based on the FDI Oral health criteria, the task team—which included experts from FDI Vision 2020—developed a timeline through three rounds of consensus-building workshops. The schedule was put into the OHO app after being evaluated for content validity and cultural relevance in India by a team of specialists. The participating dentists who attended a training session were given access to the app, which helped to standardize the data gathering process nationwide and clearly define the survey's objectives. After that, dentists learned how to record responses using the OHO app. Over the course of thirteen months, from December 2021 to January 2023, data were gathered from one thousand patients. The app's questionnaire consisted of two parts. The first part was the Dental Practice Questionnaire, in which dentists responded to questions on practice trends, features of services provided at dental clinics, and oral health seeking behavior and treatment delivery. The second part was the Patient Questionnaire, which allowed dentists to gather information from patients on daily affects, mouth hygiene practices, and dental visitation patterns. A 5-point Likert scale (0–4) was used to administer the questions on daily affects, with 4 being the greatest influence. A thorough clinical examination based on the 2013 WHO oral health assessment form was used to follow up on data on the patients' clinical oral health status. A participant information document was given to each patient, and before to data collection, informed permission was acquired. Only the Indian Dental Association had access to the data that the dentists had gathered, which was kept on the FDI's computer. The data were agreed to be used only for study and not for commercial purposes. IBM SPSS version 20 software (IBM Corp., Armonk, NY, USA) was used to analyze the survey data using descriptive statistics, Chi square tests, and Mann-Whitney U tests.

III. Results

Of the 1,000 respondents, 39% (n = 390) were women and 61% (n = 610) were men. Nearly 238 (23.8%) of the individuals had no formal education, whereas 472 (47.2%) had finished tertiary education. The average number of missing teeth was 3.72 ± 1.92 , decaying teeth were 2.48 ± 1.42 , and filled teeth were 1.76 ± 1.01 . Gingivitis was the most prevalent kind of periodontal disease, accounting for about 45% of cases. 8.1% of participants had never seen a dentist, compared to 51.5% who had done so within the previous year. Recent dental visits exhibited an inverse relationship with education but no significant correlation with age [Table 1].

Table 1: Association between age group and dental visiting patterns

Age group	Previous dental visit		P
	Within the past 12 months n (%)	Not within the past 12 months n (%)	
18-24 years	60 (58.25)	43 (41.75)	0.063
25-34 years	186 (50)	186 (50)	
35-44 years	150 (55.76)	119 (44.23)	
45-54 years	79 (55.24)	64 (44.75)	
55-64 years	46 (50)	46 (50)	
≥65 years	9 (42.85)	12 (57.14)	

*Chi-square test; $P \leq 0.05$ considered statistically significant

Across all age categories, 94.6% of respondents said they brushed their teeth at least once a day. 68% ingested refined sugar on a daily or more regular basis, with over 80% of those in the 18–24 age range doing so. There was no age-related difference in the frequency of consumption of sugary drinks, while the frequency of consumption of sugary foods was lower in the 35–54 age groups [Table 2].

Table 2: Association between age group and oral health behaviours

Age group	Tooth brushing frequency		P
	≥ Once a day n (%)	< Once a day n (%)	
18-24 years	93 (90.3)	10 (9.7)	0.167
25-34 years	360 (96)	15 (4)	
35-44 years	255 (95.86)	11 (4.13)	
45-54 years	122 (91.04)	12 (8.9)	
55-64 years	91 (95.79)	4 (4.21)	
≥65 years	24 (88.89)	3 (11.11)	
Sugary food consumption			
18-24 years	78 (75.73)	25 (24.27)	0.016†
25-34 years	220 (65.67)	115 (34.32)	
35-44 years	172 (60.13)	114 (39.87)	
45-54 years	89 (57.79)	65 (42.21)	
55-64 years	63 (66.31)	32 (33.69)	
≥65 years	19 (70.37)	8 (29.63)	
Sugary drink consumption			
18-24 years	84 (81.55)	19 (18.45)	0.589
25-34 years	293 (79.18)	77 (20.81)	
35-44 years	200 (73.52)	72 (26.47)	
45-54 years	100 (74.62)	34 (25.37)	
55-64 years	72 (75.79)	23 (24.21)	
≥65 years	22 (81.48)	5 (18.52)	

*Chisquare test; $P \leq 0.05$ considered statistically significant; † denotes significance

Tobacco use was somewhat higher than 34.8% of individuals; it peaked in the 45–54 age range and then progressively declined [Table 3]. The majority of participants stated that they began smoking between the ages of 20 and 25. The 18–24 and 25–34 age groups were more likely to chew tobacco. Thirty-three percent of dentists said they would send patients to cessation centers, and almost all reported giving direct advise on quitting tobacco.

Table 3: Association between age group and the habit of tobacco consumption

Age group	Habit of tobacco consumption		P
	Yes n (%)	No n (%)	
18-24 years	23 (22.33)	80 (77.67)	<0.001†
25-34 years	138 (40.11)	206 (59.88)	
35-44 years	120 (42.85)	160 (57.14)	
45-54 years	71 (47.01)	80 (52.98)	
55-64 years	42 (44.21)	53 (55.79)	
≥65 years	9 (33.33)	18 (66.67)	

*Chisquare test; $P \leq 0.05$ considered statistically significant; † denotes significance

Table 4: Differences in domain-wise mean oral impact scores in the past 12 months based on gender

Domain	Gender	Mean±SD	Mean rank	P
Discomfort	Male	0.93±1.299	499.42	0.089
	Female	1.12±1.53	500.58	
Pain	Male	0.874±1.41	499.16	<0.036†
	Female	1.2±1.62	500.84	
Spitting blood	Male	0.687±1.24	500.87	0.93
	Female	0.667±1.27	499.13	
Difficulty eating/ chewing	Male	0.96±1.429	506.52	0.379
	Female	1.077±1.51	493.48	
Embarrassed to smile /laugh	Male	0.581±1.13	523.08	0.969
	Female	0.567±1.258	476.92	

*Mann Whitney U test; $P \leq 0.05$ considered statistically significant; † denotes significance

432 individuals (43.2%) reported discomfort in their mouths, teeth, or dentures during the previous year; 36% had trouble eating; and 33.7% reported pain. In other oral impact locations, there were no significant gender differences, however women felt much higher pain than men [Table 4]. More than 46.8% of respondents said their dental health was very good or good, while 17.4% said it was bad or very poor. Ratings of poor oral health rose with age. Less than 10% of the time spent on preventative treatment and more than 50% on curative care was reported by the majority of dentists who took part in this study. 51% of people used dental amalgam for restorations, and 59% were not aware of the UN Minamata Convention on Mercury's restrictions on amalgam usage.

IV. Discussion

The FDI's Oral Health Observatory initiative was designed to gather standardized data on oral health worldwide (Fernandez et al., 2016). The project's goal is to present a thorough overview of oral health both locally and globally. The larger objective is to compile empirical data from different countries in order to promote oral health as a top priority on the global healthcare agenda, particularly given the detrimental impact that poor dental health has on overall wellness. The survey carried out in India as part of the FDI OHO project confirms the nation's low care-seeking habits and deteriorated oral health condition (Batra et al., 2020).

The fact that participants in the study were seeking treatment at an oral healthcare institution highlights the possibility that the general national profile may be worse. The significant incidence of periodontal disease and the mean filled component being five times lower than the sum of the decaying and missing components point to the need for better oral healthcare seeking behaviors. According to the research, periodontal disease and dental caries have a significant negative influence on quality of life due to symptoms that interfere with everyday activities and wellbeing, such as bleeding gums, tooth mobility, poor breath, and pain (Cunha-Cruz et al., 2007). With over 40% of participants experiencing discomfort and a little lower number reporting difficulties eating due to oral health problems, the study's findings made it abundantly obvious how poor dental health affects quality of life and day-to-day living. One of the main advantages of including the survey's questions about the day-to-day effects of oral health is that the data they produce easily supports the larger goal of persuading decision-makers that this is an area that significantly affects the country's citizens' quality of life.

According to our study's findings, female participants' pain levels from poor periodontal health were noticeably greater. According to a study conducted in another developing nation (Figueiredo et al., 2013), social and cultural variables cause genders to perceive pain and oral health differently, with women more frequently reporting chewing difficulty. This emphasizes the necessity of investigating the potential impact of systemic hormonal variables on dental health. Better oral health is directly correlated with dental attendance (Richards W. and Ameen, 2002). More than half of the individuals in our research had attended the clinic in the previous 12 months. In particular, 45% of individuals went for routine checkups; younger people were more likely than older participants to do so. Regardless of the nation's socioeconomic profile, similar patterns have been noted in other demographic subgroups (Afonso-Souza et al., 2007).

Due mostly to tobacco products like pan masala, gutka, and cigarettes, India has the highest incidence of oral cancer worldwide, affecting 12% of men and 8% of women (Preeti and Raut, 2012). In line with NSS results of commencement between ages 15 and 24 (NSS, 1993-94), more over 35% of individuals in our research had tobacco habits, frequently beginning between ages 20 and 25. Beyond just causing mouth cancer, tobacco use also increases the risk of lung and heart problems. It is critical to detect and treat precancerous and malignant tumors in these populations as soon as possible. Oral precancers and malignancies among young individuals in India have alarmingly increased as a result of rising tobacco product usage. The dentistry community has a great deal of potential to spearhead national campaigns to help people quit smoking. According to our survey, all dentists gave their tobacco-using patients advise on quitting, and 33% of them referred them to cessation centers, highlighting the dental profession's contribution to tobacco cessation.

Dental practice in India has prioritized reactive measures above preventative care, with a treatment-centric approach (Gambhir et al., 2016). Despite acknowledging the necessity of prevention, our research reveals that the majority of dentists devote more than half of their time to curative treatment and less than 10% to prevention. It is important to emphasize the paradigm shift from curative to preventative. The top excuses for not seeing a dentist in the last year were being too busy and thinking there was nothing wrong with their teeth, which amply illustrates the narrow-minded attitude regarding the significance of oral health. Additionally, it was noted that a startlingly high percentage of survey respondents consumed sugary meals and beverages. These results demonstrate the need for more proactive primary preventive treatments, and it is encouraging that oral health has just been included in the Ayushman Bharat Initiative's wellness scope (Ministry of Health and Family Welfare). The focus on oral health is more tangible than ever thanks to the WHO's adoption of the historic global oral health strategy during its 75th assembly [18]. Now is the ideal moment for the dental community as a whole to take advantage of this focus for universal oral health coverage (WHO, 2020).

The cost of treating and preventing oral disorders in India in 2019 was \$64 million overall, \$0.05 per person, and \$7,249 million in lost productivity (WHO, 2022). In 2015, oral health problems cost the typical Indian 117 INR (~1.8), with productivity losses from gum disease, tooth decay, and severe tooth loss totaling \$1.8. After accounting for purchasing power parity (PPP), productivity losses increased to \$6.69 (434.85 INR) and the per capita cost increased to \$0.52. With prices under PPP doubling and productivity losses increasing 13 times for every INR (33.8) spent on oral healthcare, this suggests that access to quality dental care is limited in India (Balaji, 2018). The need for strong, evidence-based oral health policy is highlighted by the shortcomings of current public health initiatives.

Limitations

This survey's use of a nonprobability convenience sample was one of its primary drawbacks. Language barriers may have impacted non-English participants despite training sessions. Recall and social desirability may skew self-reported information about dental appointments, behaviors, and oral health. Notwithstanding these problems, this study is an important step toward India's comprehensive oral health coverage, meeting international standards and working with international partners.

V. Conclusion

It was found that the questionnaire needed to be modified to fit the country's situation and distributed to a wider, more representative population. Based on workshop observations, IDA hopes to close the shortcomings found in the present study and launch a viable initiative soon. Our goal is to establish a comprehensive oral health monitoring system that will help guide policy and enhance public health outcomes in India.

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