



PERCEPTION, KNOWLEDGE, AND UTILIZATION OF INTERDENTAL AIDS AMONG PATIENTS AT A GOVERNMENT DENTAL COLLEGE AND HOSPITAL IN AHMEDABAD: A CROSS-SECTIONAL ANALYSIS

Dentistry

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ABSTRACT

Background: Oral health is integral to overall health, with the oral cavity serving as a reflection of general well-being. Effective oral hygiene practices, including the use of interdental aids, play a crucial role in maintaining oral health. This study aimed to assess the perception and usage of interdental aids among patients at Government Dental College and Hospital, Ahmedabad. **Methods:** A cross-sectional questionnaire-based study was conducted involving 500 participants. Data collection utilized structured questionnaires in English and Gujarati, assessing oral hygiene practices, awareness of interdental aids, and demographic information. Statistical analysis was performed using Microsoft Excel, with significance set at $p < 0.05$. **Results:** The majority (75%) of participants used toothbrushes and toothpaste for oral hygiene, with only 34% employing interdental aids. Awareness of interdental aids was found to be higher among patients undergoing treatment (80%) compared to those in the outpatient department (68%). Educational level significantly influenced awareness, with higher percentages among participants with a bachelor's degree or higher (70%). **Conclusion:** The study highlights inadequate awareness and usage of interdental aids among patients at Government Dental College and Hospital, Ahmedabad. Patients receiving treatment demonstrated better awareness, underscoring the role of healthcare providers in promoting oral hygiene education. These findings emphasize the need for targeted educational interventions to improve oral health practices, particularly regarding interdental aid usage.

KEYWORDS

INTRODUCTION:

Oral health is now recognized as crucial to overall well-being, serving as a reflection of one's general health. The oral cavity can indicate various systemic conditions and diseases, making its maintenance essential for holistic health. Numerous studies have highlighted the significant association between oral health and general health, emphasizing that poor oral hygiene can lead to severe systemic issues such as cardiovascular diseases, diabetes, and respiratory infections(1). Thus, awareness and proper practices of oral hygiene are essential in mitigating these risks.

Oral health status is influenced by a complex interplay of factors, including personal awareness, behaviors, and perceptions. Awareness is fundamental for adopting health-related behaviors, which are activities carried out by individuals to maintain or improve health and prevent disease(2). This awareness and subsequent health behaviors often evolve with age and educational attainment, making it crucial to understand these dynamics to design effective oral health promotion strategies.

Effective plaque control is vital for maintaining oral health(3). Supragingival plaque, if not controlled, can alter the quantity and composition of both supragingival and subgingival microbiota, contributing to periodontal diseases and dental caries(4). Various interdental cleaning aids such as dental floss, interdental brushes, wooden interdental aids, and oral irrigators have been proven to enhance plaque control significantly(5). Studies have demonstrated that interdental cleaning is associated with better periodontal health, fewer caries, and a lower incidence of missing teeth(6). These findings align with others who reported that regular interdental cleaning correlates with reduced plaque, calculus, and gingivitis(5).

Despite the proven benefits of interdental cleaning, awareness and usage of these aids remain suboptimal in many populations(7). Health education plays a pivotal role in enhancing knowledge and changing attitudes towards oral hygiene practices. Effective health education programs can develop and sustain behaviors that promote oral health in individuals and communities(8). Given the importance of interdental aids in maintaining oral health, it is imperative to assess the current levels of awareness and perception among patients to identify gaps and areas for improvement.

Ahmedabad, a major city in the state of Gujarat, India, is home to a

diverse population with varying levels of education and socioeconomic status. Understanding the perception and knowledge of oral hygiene practices among patients attending the Government Dental College and Hospital can provide valuable insights for designing effective oral health education programs. By identifying the gaps in knowledge and practice, this study aims to inform strategies for improving oral health education and promoting better oral hygiene practices among the population. Statistical analysis was performed to identify associations between demographic factors and oral hygiene behaviors.

AIMS And Objectives:

The aim of this study is to assess the awareness, knowledge, and self-reported use of interdental aids among patients attending a dental college and hospital in Ahmedabad, Gujarat, India. The objectives are to determine the prevalence of awareness about interdental aids among the study population, evaluate the level of knowledge regarding the benefits and proper use of interdental aids, and assess the self-reported frequency of interdental aid use among participants. Additionally, the study aims to identify factors associated with interdental aid awareness and use, such as age, education level, and prior dental treatment experience.

METHODOLOGY

This cross-sectional survey design aimed to assess patients' knowledge and perceptions regarding oral hygiene products at a dental college and hospital in Ahmedabad, India. A convenience sample of 500 patients visiting the hospital between March 1st, 2022, and March 31st, 2022, was recruited. Inclusion criteria included patients aged 18 years or above who could provide informed consent and understand either English or Gujarati. The sample size was calculated using a statistical formula considering an expected proportion of 65.7%, a desired confidence level of 95%, and a relative precision of 5%. The calculated sample size of 514 was rounded to 500 for feasibility reasons.

Data collection involved a self-administered questionnaire developed in both English and Gujarati to ensure accessibility. The questionnaire was pilot-tested on 40 participants to assess clarity, comprehensibility, and completion time, with minor revisions made based on feedback. The final questionnaire consisted of 12 multiple-choice questions covering oral hygiene practices, dentifrice type and brand preference, brushing frequency and duration, toothbrush type selection, and reasons for choosing a specific toothpaste brand. Researchers

introduced the study objectives to eligible patients and obtained informed consent, encouraging participants to complete the questionnaire independently while remaining available to answer any questions. Confidentiality and anonymity were emphasized throughout the process.

Completed questionnaires were anonymized and coded for data entry. Data was entered into a Microsoft Excel spreadsheet (version 2020) and underwent a quality control check to ensure accuracy. Descriptive statistics (frequencies and percentages) summarized demographic characteristics and responses to questionnaire items. Chi-square tests were conducted to identify potential associations between categorical variables (e.g., brand preference and demographic factors), with a significance level set at $\alpha = 0.05$. This study followed the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines to ensure comprehensive reporting and transparency.

RESULTS

This section presents a detailed analysis of the findings regarding oral hygiene knowledge and practices among dental patients visiting a dental college and hospital in Ahmedabad, India. Data are presented as frequencies and percentages, with statistically significant differences between groups highlighted using chi-square tests ($\alpha = 0.05$).

Demographics (Table 1): A total of 500 patients participated, with 45.8% males and 54.2% females. The largest age group was 20-30 years (36%), followed by 31-40 years (28.4%). Educational levels varied, with the majority having up to high school education (46.8%)

Table 1: Distribution Of The Total Population According To Gender, Age Group, Treatment Status, And Education Level.

Parameters	Sub-Parameters	Frequency	Percent
Sex	Male	271	54.2
	Female	229	45.8
Age Group	15-30	180	36
	31-40	142	28.4
	41-50	98	19.6
	50 and above	80	16
Treatment Status	OPD	321	64.2
	Periodontal Treatment	179	35.8
Education Level	None	31	6.2
	Up to High School	234	46.8
	Bachelor's Degree	174	34.8
	Postgraduate and above	61	12.2

Usage Patterns of Oral Hygiene Aids Among Patients (Table 2)

Table 2. Perception And Knowledge Of Different Parameters On The Use Of Brush And Toothpaste To Clean Teeth.

Variables		Toothbrush and Toothpaste	Toothbrush, Toothpaste, and Floss	Miswak	I Don't Brush My Teeth	Other
Sex	Male	N 206	60	5	0	0
		% 76.01	22.14	1.85	0.00	0.00
	Female	N 165	57	6	0	1
		% 72.05	24.89	2.62	0.00	0.44
Age Group	15-30	N 104	76	0	0	0
		% 57.78	42.22	0.00	0.00	0.00
	31-40	N 95	47	0	0	0
		% 66.90	33.10	0.00	0.00	0.00
	41-50	N 91	5	2	0	0
		% 92.86	5.10	2.04	0.00	0.00
	50 and above	N 70	0	9	0	1
		% 87.50	0.00	11.25	0.00	1.25
Treatment Status	OPD	N 272	43	5	0	1
		% 84.74	13.40	1.56	0.00	0.31
	Periodontal Treatment	N 96	78	4	0	1
		% 53.63	43.58	2.23	0.00	0.56
Education Level	None	N 19	0	11	0	1
		% 61.29	0.00	35.48	0.00	3.23
	Up to High School	N 107	127	0	0	0
		% 45.73	54.27	0.00	0.00	0.00

Bachelor's Degree	N	89	85	0	0	0
	%	51.15	48.85	0.00	0.00	0.00
Postgraduate and Above	N	34	27	0	0	0
	%	55.74	44.26	0.00	0.00	0.00

The majority of patients used toothbrush and toothpaste (males: 76.01%, females: 72.05%), with floss usage higher among females (24.89%) compared to males (22.14%). Use of Miswak was higher among those with no formal education (35.48%).**Oral Hygiene Practices (Tables 3 & 4):** Most participants (74.2%) used a toothbrush and toothpaste, with 65.4% brushing once daily and 33.4% twice daily. Soft brushes were preferred by 40.6%, and medium brushes by 47%. Brushing techniques varied, with horizontal (37.8%) and circular (40.4%) being the most common.

The most frequently reported brushing technique was horizontal (n = 189, 37.8%), followed by circular (n = 202, 40.4%) and vertical (n = 74, 14.8%).

Table 3. Distribution Of Perception And Knowledge On The Use Of A Toothbrush And Tooth Paste Among Patients

Questions	Answers	Frequency	Percent
1. Do you clean your teeth?	Yes	500	100
	No	0	0
2. What do you use to clean your teeth?	Toothbrush and toothpaste	371	74.2
	Toothbrush, toothpaste, and floss	117	23.4
	Miswak	110	22
	I don't brush my teeth	0	0
	Other	1	0.2
3. How often do you clean your teeth?	Twice or once a week		
	Not every day		
	Once a day	327	65.4
	Twice a day	167	33.4
	More than twice a day	6	1.2
4. How long do you take to brush your teeth?	Not applicable	12	2.4
	About half a minute	65	13
	About 1-2 min	85	17
	About 3-4 min	142	28.4
	More than 5 min	180	36
5. What type of brush do you use?	Not applicable	27	5.4
	Hard	12	2.4
	Soft	203	40.6
	Extra soft	37	7.4
	Medium	235	47
6. What brushing technique do you use?	Never noticed	13	2.6
	Horizontal	189	37.8
	Vertical	74	14.8
	Circular	202	40.4
	Toothbrush horizontal and bristles part-way on the gum	23	4.6
7. How often do you change your brush?	Not applicable	12	2.4
	Every 3 months	206	41.2
	Every 6 months	130	26
	When bristles get worn or frayed	94	18.8
	Not applicable	58	11.6
8. What type of toothpaste do you use?	Herbal toothpaste	72	14.4
	Fluoridated toothpaste	59	11.8
	Anti-sensitive toothpaste	112	22.4
	Any toothpaste, whichever is cheaper	192	38.4
	Toothpaste for whitening teeth		

Table 4: Distribution Of Perception And Knowledge On The Use Of Type Of Tooth Brush Among Patients.

Variables			Hard	Soft	Extra Soft	Medium	Never Noticed	Not Applicable	p Value
Sex	Male	N	10	80	15	161	5	0	<0.01
		%	3.69	29.52	5.54	59.41	1.85	0.00	
	Female	N	2	123	22	74	8	0	
		%	0.87	53.71	9.61	32.31	3.49	0.00	

Age Group	15-30	N 0	70	1	106	3	0	<0.01
		% 0.00	38.89	0.56	58.89	1.67	0.00	
	31-40	N 9	56	12	61	4	0	
		% 6.34	39.44	8.45	42.96	2.82	0.00	
	41-50	N 2	61	14	16	5	0	
Treatment Status		% 2.04	62.24	14.29	16.33	5.10	0.00	
	50 and Above	N 1	16	10	52	1	0	
		% 1.25	20.00	12.50	65.00	1.25	0.00	
	OPD	N 9	81	3	215	13	0	<0.01
		% 2.80	25.23	0.93	66.98	4.05	0.00	
	Periodontal Treatment	N 3	122	34	20	0	0	
		% 1.68	68.16	20.67	9.50	0.00	0.00	

Knowledge and Use of Interdental Aids (Tables 5 & 6):
Awareness of interdental aids was higher among females (47.16%) and younger age groups, particularly 15-30 years (63.33%). Among education levels, awareness increased with higher education, reaching 70.49% among postgraduates. Of those aware, 42% knew about interdental aids, with 34.8% using them, primarily dental floss (22.6%). Mouthwash usage was reported by 43.6%, and 95.2% cleaned their tongue regularly.

Table 5. Perception And Knowledge Of Different Parameters On “Do You Know What Interdental Aids Are?”

1. Do You Know What Interdental Aids Are?				p Value	
		Yes	No		
Sex	Male	N 102	169	<0.01	
		% 37.64	62.36		
	Female	N 108	121		
		% 47.16	52.84		
Age Group	15-30	N 114	66	<0.01	
		% 63.33	36.67		
	31-40	N 47	95		
		% 33.10	66.90		
	41-50	N 30	68		
		% 30.61	69.39		
	50 and Above	N 19	61		
		% 23.75	76.25		
Treatment Status	OPD	N 69	252	<0.01	
		% 21.5	78.5		
	Periodontal Treatment	N 141	38		
		% 78.77	21.23		
Education Level	None	N 0	31	<0.01	
		% 0.00	100.00		
	Up to High School	N 97	137		
		% 41.45	58.55		
	Bachelor's Degree	N 71	104		
		% 40.80	59.77		
	Postgraduate and Above	N 43	18		
		% 70.49	29.51		

Table 6: Distribution Of Perception And Knowledge On The Use Of Interdental Aids And Mouthwash Among The Patients

Questions	Answers	Frequency	Percent
1. Do you know what interdental aids are?	Yes	210	42
	No	290	58
2. Do you use dental floss or any other device to clean between teeth?	Yes	174	34.8
	No	36	7.2
3. Which of the following interdental aids do you use?	Dental Floss	113	22.6
	Super Floss: A special dental floss that is designated to clean under bridge or between braces	4	0.8
	Interdental brush	49	9.8
	Waterpik flosser	0	0
	Toothpick	8	1.6
	Never used any	36	7.2

4. From the previous question, why did you choose to use these interdental aids?	It is simple and comfortable	57	11.4
	I have space between my teeth and I feel it is more suitable	22	4.4
	I feel it is cleaner	50	10
	I have crowded teeth and I feel it is suitable	5	1
	It was recommended by my dentist	124	24.8
5. What type of dental floss do you use?	Not applicable	0	0
	Waxed	37	7.4
	Unwaxed	41	8.2
	Never noticed, I use randomly	35	7
6. Do you use mouthwash or another dental rinse product?	Yes	218	43.6
	No	282	56.4
7. What type of mouthwash do you use?	Fluoride mouthwash	13	2.6
	Natural mouthwash	62	12.4
	Prescribed	84	16.8
	Not applicable	59	11.8
8. Do you think you can use mouthwash instead of a toothbrush to clean your teeth?	Yes	32	6.4
	No	186	37.2
9. Do you clean your tongue?	Yes	476	95.2
	No	24	4.8
10. What the type of aid do you use to clean your tongue?	With the same toothbrush	169	33.8
	Tongue scrubber/brush	307	61.4
	Not applicable		0
11. Do you have/wear braces, bridges, or any fixed prosthesis?	Yes	138	27.6
	No	362	72.4
12. Do you use Super Floss or an interdental brush between your teeth or under your bridges?	Yes	52	10.4
	No	86	17.2
	Not applicable	0	0
13. When you go to the dentist, did they explain to you how to brush your teeth or how to use interdental aids?	Yes	241	48.2
	No	259	51.8

Perception And Knowledge On The Use Of Interdental Aids And Mouthwash Among Patients

Of the respondents, 42% knew about interdental aids, with 34.8% using them—mainly dental floss (22.6%) and interdental brushes (9.8%). Most used mouthwash (43.6%), and 95.2% cleaned their tongue, primarily with tongue scrubbers. 27.6% had dental appliances, and 48.2% received guidance on oral hygiene from their dentist.

DISCUSSION

The findings provide valuable insights into the self-reported behaviors and knowledge gaps in this population. The majority of participants reported using a toothbrush and toothpaste for oral hygiene which aligns with previous research(7). However, the prevalence of flossing use (23.4%) highlights a missed opportunity for optimal plaque removal. This is concerning as interdental cleaning is crucial for maintaining healthy gums and preventing periodontal disease(6). Furthermore, brushing frequency and duration varied considerably. While a significant portion brushed twice daily (33.4%), a substantial number brushed only once daily (65.4%). which falls short of the recommended twice-daily brushing frequency(9). The variability in brushing duration further suggests potential inconsistencies in plaque removal(10). The most commonly used brush type was medium, followed by soft. Females and younger participants were more likely to use soft brushes, which aligns with dental recommendations to prevent gum abrasion. However, a significant proportion of participants (2.4%) used hard brushes, which can damage gums and tooth enamel(11).

Interestingly, the horizontal brushing technique was the most

prevalent, though circular or vertical techniques are generally considered more effective(11). Awareness of interdental aids was notably higher among patients undergoing treatment (79%) compared to those in the outpatient department (21%). Professional guidance plays a significant role in enhancing patient knowledge and adoption of oral hygiene practices, as seen in patients undergoing periodontal treatment(12). Educational level significantly influenced awareness, with participants holding a bachelor's degree or higher showing greater awareness of interdental aids than those with lower educational attainment. This finding aligns with previous research, which suggests that higher education levels are positively correlated with oral health knowledge(13). Gender differences in interdental aid awareness and usage were also observed, with females showing better knowledge (47.16%) than males (37.64%). This is consistent with findings from other studies reporting higher oral hygiene awareness among females(14). This difference could be attributed to factors such as higher health consciousness and more frequent healthcare visits among women.

Age also played a role, with younger participants (15-30 years) demonstrating higher awareness and usage of interdental aids compared to older participants. This finding mirrors those of Smith (2019), who suggested that younger individuals are more likely to adopt modern oral health practices(15). Older individuals may be less aware of the benefits of interdental cleaning and more inclined to follow traditional methods.

When compared with national data, this study's findings are similar to those of Pandey et al. (2021), who reported that only 30% of participants used interdental aids(16). This is notably lower than the usage rates reported in developed countries, where a study by Knöfler et al. (2017) in Germany found that 60% of participants regularly used interdental brushes or dental floss(17). This highlights the potential impact of socioeconomic factors and accessibility on oral hygiene practices(18).

The study underscores the critical role of dental professionals in promoting the use of interdental aids. Participants undergoing periodontal treatment showed higher awareness and usage, reflecting the effectiveness of direct professional advice. This supports the findings of Luzzi et al. (2020), who reported that dental visits were significantly associated with better oral hygiene practices(19). The high awareness among treated patients aligns with the concept that continuous patient education and reinforcement during dental visits can lead to improved oral health behaviours.

Limitations:

This study has limitations. The convenience sample may not represent the broader population. Additionally, self-reported data on brushing habits and interdental aid use could be prone to recall bias. Future studies with larger, more representative samples and objective measures of oral hygiene practices would be beneficial.

CONCLUSION:

This study revealed that while most participants used a toothbrush and toothpaste, there were concerning gaps in knowledge and practices related to optimal oral hygiene. Lower than recommended brushing frequency and duration, infrequent flossing, and the use of hard-bristled brushes highlight areas for improvement. Public health initiatives and educational interventions promoting optimal brushing practices and the importance of interdental cleaning are crucial for promoting better oral health in this population.

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