



Assessing Oral Hygiene knowledge and Awareness in Rural Bhavnagar: A Questionnaire – Based Cross-sectional Study

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ABSTRACT

Background: Maintaining good oral hygiene is essential for overall health and well-being. However, in rural areas, limited awareness and resources pose significant challenges, leading to poor oral health outcomes. Understanding the level of knowledge and attitudes regarding oral hygiene practices is crucial for developing effective interventions. This study aimed to assess the knowledge and attitudes related to oral hygiene practices among adults in a rural area of Bhavnagar district, Gujarat.

Methods: A cross-sectional study was conducted using a structured questionnaire administered to 250 participants. Data collection involved face-to-face interviews, and statistical analysis was performed using SPSS version 22.0.

Results: The findings revealed significant gaps in knowledge regarding proper oral hygiene practices, with a notable proportion of participants unaware of the role of oral health in preventing systemic diseases. Female participants demonstrated greater awareness and adherence to oral hygiene practices compared to males. Cultural beliefs and lack of access to dental care services further influenced attitudes and behaviours.

Conclusion: The study underscores the need for targeted educational interventions and improved access to oral healthcare facilities in rural communities. Enhancing awareness and promoting

regular dental check-ups can contribute to better oral health outcomes and overall well-being.

KEY WORDS: Oral health; self-perception; knowledge; attitude; motivation; oral hygiene

I. INTRODUCTION

Oral diseases represent a major public health challenge in developing countries due to their rising prevalence, economic burden, and detrimental effects on individuals' quality of life.^[1] According to the World Health Organization (WHO), "The promotion of oral health is a cost-effective strategy to reduce the burden of oral disease and maintain oral health and quality of life."^[2] The principle established in the 1950s, emphasizing effective plaque control as a key measure in managing periodontal diseases, remains relevant today.^[3]

The perception of dental care quality and the likelihood of patients returning for further treatment are significantly influenced by a practitioner's professionalism, empathy, and the quality of oral hygiene guidance provided.^[4] A substantial proportion of oral diseases can be mitigated through oral health education, which plays a crucial role in shaping positive oral health attitudes and behaviors within the general population.^[5,6] Oral self-care, an essential component of general self-care, includes preventive measures, timely diagnosis, and professional dental



consultations. Effective oral self-care practices have been widely recognized as a fundamental strategy for maintaining optimal oral health as part of overall well-being.^[7]

Despite the global emphasis on oral health promotion, there is a notable lack of published literature on dental awareness, attitudes, and health behaviors, particularly among rural populations in India. Evaluating these aspects within rural communities provides valuable insights into their level of dental awareness and oral health behaviors. Therefore, this study was conducted among outpatients visiting the College of Dental Science and Hospital in Amargadh, a rural area in Bhavnagar district, to assess their oral health knowledge, attitudes toward oral care practices.

II. METHODOLOGY

A questionnaire-based cross-sectional survey was conducted from May to October 2023 among 250 outpatients visiting the College of Dental Science and Hospital, Amargadh, a rural area in Bhavnagar district. Face-to-face interviews were conducted using a structured questionnaire designed to assess oral hygiene practices while considering gender differences.

Inclusion Criteria:

- Systemically healthy individuals.
- Age between 20 to 60 years.
- Patients willing to provide informed consent.

Exclusion Criteria:

- Patients with a history of systemic disease.
- Pregnant and lactating women.
- Patients who had undergone scaling in the past six months.

Participants were recruited using non-probability convenience sampling. Responses from the 250 eligible participants, meeting the inclusion and exclusion criteria, were manually recorded by interviewers to ensure data accuracy. Data were entered into Microsoft Excel and analysed using SPSS version 22.0. The Chi-square test was used to compare oral hygiene practices between males and females, while Pearson correlation analysis was applied to assess the relationship between socio-economic status and oral hygiene practices. Ethical clearance was obtained from the institutional ethical committee, and informed consent was obtained from all study participants.

III. RESULTS

The study population comprised 172 (68.8%) male and 78 (31.2%) female patients who

reported to the Department of Periodontology. To minimize potential bias from gender disparity, the statistical analysis was conducted with an equal representation of male and female participants, ensuring a balanced dataset.

Among the 250 participants, 79.1% of males and 89.7% of females correctly identified the number of dentitions in a lifetime. Despite this, statistical analysis revealed no significant difference in knowledge between those aware and unaware of the number of dentitions ($p = 0.088$). (Chart 1, Table 1)

Regarding the total number of deciduous and permanent teeth, 41.9% of males and 38.5% of females answered correctly. However, the difference in awareness between genders was not statistically significant ($p = 0.168$). (Chart 2, Table 1) When asked about the primary purpose of tooth brushing, 65.7% of males and 69.2% of females correctly stated that it helps prevent tooth decay and gum disease. The observed gender-based difference was statistically significant ($p = 0.018$). (Chart 3, Table 1) Awareness of dental plaque was significantly different between genders. While 29.7% of males and 48.7% of females identified plaque as the presence of white patches on teeth, a substantial portion of participants (44%) lacked knowledge on the topic. The difference was highly significant ($p = 0.0001$). (Chart 4, Table 1)

A total of 62.8% of males and 73.1% of females recognized gum bleeding as an indicator of gum disease. The difference in awareness levels was statistically significant ($p = 0.049$), highlighting the need for further education on early signs of periodontal disease. (Chart 5, Table 1) Similarly, 76.7% of males and 87.2% of females were aware that retained sweet food on teeth can lead to tooth decay. The gender-based difference in knowledge was statistically significant ($p = 0.038$). (Chart 6, Table 1) The study found that 88.4% of males and 87.2% of females acknowledged the link between oral health and overall body health. This difference was statistically significant ($p = 0.047$), suggesting that oral health education programs should reinforce the systemic impact of poor oral hygiene. (Chart 7, Table 1) Regarding risk factors for oral cancer, 88.4% of males and 93.6% of females identified gutkha, tobacco chewing, and smoking as primary causes. The difference in awareness was statistically significant ($p = 0.044$), indicating that anti-tobacco campaigns should target both genders effectively. (Chart 8, Table 1) A strong consensus was observed regarding the importance of regular dental visits, with 93.0% of males and 100% of females acknowledging their necessity. This gender difference was statistically



significant ($p = 0.027$), underlining the need to encourage more males to prioritize routine dental check-ups. (Chart 9, Table 1)

Chart10 shows that 98.0% of males and 100% of females correctly identified that gutkha and tobacco chewing are bad habits. Among the 248 (99.2%) correct answers, 68.8% of males and 31.2% of females were aware of this. The difference in awareness was statistically significant ($p = 0.043$), as detailed in Table 1. In Chart 11, 98.3% of males and 98.7% of females correctly answered that smoking is a bad habit. Among the 246 (98.4%) correct responses, 67.6% of males and 30.8% of females were aware of this. The difference in attitudes towards smoking was statistically significant ($p = 0.031$), as outlined in Table 1.

When asked about the role of toothpaste in oral hygiene, 47.1% of males and 41.0% of females correctly identified its importance in cleaning teeth. The difference was statistically significant ($p = 0.047$), suggesting that awareness campaigns should emphasize proper toothpaste selection and usage. (Chart 12, Table 1) The hardness of toothbrush bristles was recognized as a factor affecting oral health by 65.7% of males and 62.8% of females. The gender-based difference in awareness was statistically significant ($p = 0.046$), pointing to the need for better guidance on toothbrush selection.(Chart 13, Table 1)

Reports of gum bleeding during brushing were noted in 55.8% of males and 57.7% of females. The difference in awareness of this issue was statistically significant ($p = 0.046$), indicating the necessity for improved preventive care education.(Chart 14, Table 1) Regarding the replacement of missing teeth with artificial alternatives, 39.0% of males and 41.0% of females recognized its importance. However, the difference was not statistically significant ($p = 0.951$), suggesting that more educational efforts are needed to emphasize the benefits of dental prosthetics. (Chart 15, Table 1). Bar Chart 16 shows that 51.2% of males and 38.5% of females knew that Dentist play crucial role in not only treatment but prevention also. The difference in awareness was not statistically significant ($p = 0.147$), as detailed in Table 1.

A majority of participants, 91.3% of males and 97.4% of females, recognized that maintaining oral hygiene is crucial for overall health. The gender-based difference in awareness was statistically significant ($p = 0.019$), reinforcing the need for gender-specific oral health education initiatives. (Chart 17, Table 1)

These findings underscore the disparities in oral health awareness and practices between genders, emphasizing the necessity for targeted educational interventions to bridge knowledge gaps and promote better oral health behaviors in rural communities.

TABLE 1: Distribution of the Knowledge and attitude on oral hygiene practice according to gender.

QUESTIONS	RESPONSES	MALE (%)	FEMALE (%)	TOTAL (%)	PEARSON CHI-SQUARE VALUE	P VALUE
1 Number of dentitions sets in life of an individual:	a) 1	17 (9.9%)	1 (1.3%)	18 (7.2%)	6.550	0.088
	b) 2	136 (79.1%)	70 (89.7%)	206 (82.4%)		
	c) 3	12 (7.0%)	4 (5.1%)	16 (6.4%)		
	d) Don't know	7 (4.1%)	3 (3.8%)	10 (4.0%)		
2 Total number of deciduous and permanent teeth?	a) 5 and 24	5 (2.9%)	0	5 (2.9%)	5.051	0.168
	b) 20 and 32	72 (41.9%)	30 (38.5%)	102 (40.8%)		
	c) 32 and 32	45 (26.2%)	29 (37.2%)	74 (29.6%)		
	d) Don't know	50 (29.1%)	19 (24.4%)	69 (27.6%)		
3 Main purpose of tooth brushing:	a) Prevention of tooth decay and gum disease	113 (65.7%)	54 (69.2%)	167 (66.8%)	1.060	0.787



	b) Achievement of cleaner and brighter teeth.	38 (22.1%)	14 (17.9%)	52 (20.8%)		
	c) To remove stains on teeth.	1 (0.6%)	0	1 (0.4%)		
	d) Don't Know	20 (11.6%)	10 (12.8%)	30 (12.0%)		
4 Meaning of dental plaque:	a) Discoloration of teeth	51 (29.7%)	38 (48.7%)	89 (35.6%)	20.370	0.0001
	b) Soft deposits on teeth	14 (8.1%)	12 (15.4%)	26 (10.4%)		
	c) White patches on teeth	15 (8.7%)	10 (12.8%)	25 (10.0%)		
	d) Don't know	92 (53.5%)	18 (23.1%)	110 (44.0%)		
5 Meaning of gum bleeding:	a) Gum disease (inflammation of gums)	108 (62.8%)	57 (73.1%)	165 (66.0%)	7.568	0.056
	b) Infection of tooth	14 (8.1%)	0	14 (5.6%)		
	c) Calcium deficiency	3 (1.7%)	2 (2.6%)	5 (2.0%)		
	d) Don't know	47 (27.3%)	19 (24.4%)	66 (26.4%)		
6 Effect of retention of sweet food on teeth:	a) Can lead to decaying of teeth	132 (76.7%)	68 (87.2%)	200 (80.0%)	6.093	0.107
	b) Calcium deficiency	2 (1.2%)	2 (2.6%)	4 (1.6%)		
	c) Leads to bleeding gums	4 (2.3%)	0	4 (1.6%)		
	d) Don't know	34 (19.8%)	8 (10.3%)	42 (16.8%)		
7 Can health of teeth and mouth affect health of body:	a) Yes	152 (88.4)	68 (87.2%)	220 (88.0%)	1.315	0.518
	b) No	8 (4.7%)	2 (2.6%)	10 (4.0%)		
	c) Don't know	12 (7.0%)	8 (10.3 %)	20 (8.0%)		
8 Reasons of oral cancer	a) Calcium deficiency	16 (9.3%)	2 (2.6%)	18 (7.2%)	3.990	0.136
	b) Gutkha and tobacco chewing, smoking.	152 (88.4%)	73 (93.6%)	225 (90.0%)		
	c) Vit. C deficiency	19 (11.0%)	8 (10.3%)	27 (10.8%)		
	d) Don't know	4 (2.3%)	3 (3.8%)	7 (2.8%)		
9 Dentists should	a) Yes	160	78 (100%)	238	5.716	0.057



be visited regularly?		(93.0%)		(95.2%)		
	b) No	10 (5.8%)	0	10(4.0%)		
	c) Don't know	2 (1.2%)	0	2 (0.8%)		
10. Gutkha and tobacco chewing is a bad habit?	a) Yes	170 (98.8%)	78 (100%)	248 (99.2%)	0.914	0.339
	b) No	2 (1.2%)	0	2 (0.8%)		
	c) Don't know	0	0	0		
11 Smoking in any form is a bad habit?	a) Yes	169 (98.3%)	77 (98.7%)	246 (98.4%)	1.237	0.539
	b) No	2 (1.2%)	0	2 (0.8%)		
	c) Don't know	1 (0.6%)	1 (1.3%)	2 (0.8%)		
12 Proper cleaning of teeth can be done without using toothpaste?	a) Yes	81 (47.1%)	32 (41.0%)	113 (45.2%)	5.198	0.074
	b) No	38 (22.1%)	11 (14.1%)	49 (19.6%)		
	c) Don't know	53 (30.8%)	35 (44.9%)	88 (35.2%)		
13 Hardness of bristles of teeth has any effect on teeth and gums?	a) Yes	113 (65.7%)	49 (62.8%)	162 (64.8%)	6.166	0.046
	b) No	23 (13.4%)	4 (5.1%)	27 (10.8%)		
	c) Don't know	36 (20.9%)	25 (32.1%)	61 (24.4%)		
14 Observed Bleeding from gums while brushing teeth?	a) Yes	96 (55.8%)	45 (57.7%)	141 (56.4%)	0.088	0.957
	b) No	40 (23.3%)	17 (21.8%)	57 (22.8%)		
	c) Don't know	36 (20.9%)	16 (20.5%)	52 (20.8%)		
15 Immediate replacement of missing teeth by artificial teeth is necessary	a) Yes	67 (39.0%)	32 (41%)	99 (39.6%)	0.101	0.951
	b) No	11 (6.4%)	5 (6.4%)	16 (6.4%)		
	c) Don't know	94 (54.7%)	41 (52.6%)	135 (54.0%)		
16 Dentists plays role only in treatment part and not in the prevention?	a) Yes	88 (51.2%)	30 (38.5%)	118 (47.2%)	3.829	0.147
	b) No	50 (29.1%)	31 (39.7%)	81 (32.4%)		
	c) Don't know	34 (19.8%)	17 (21.8%)	51 (20.4%)		
17 Do you think oral hygiene is mandatory for overall health of the body?	a) Yes	157 (91.3%)	76 (97.4%)	233 (93.2%)	3.245	0.197
	b) No	6 (3.5%)	1 (1.3%)	7 (2.8%)		
	c) Don't know	9 (5.2%)	1 (1.3%)	10 (4.0%)		



GRAPH : Distribution of the Knowledge and attitude on oral hygiene practice according to gender.

Chart 1 - Q1: Number of dentition sets in life of an individual

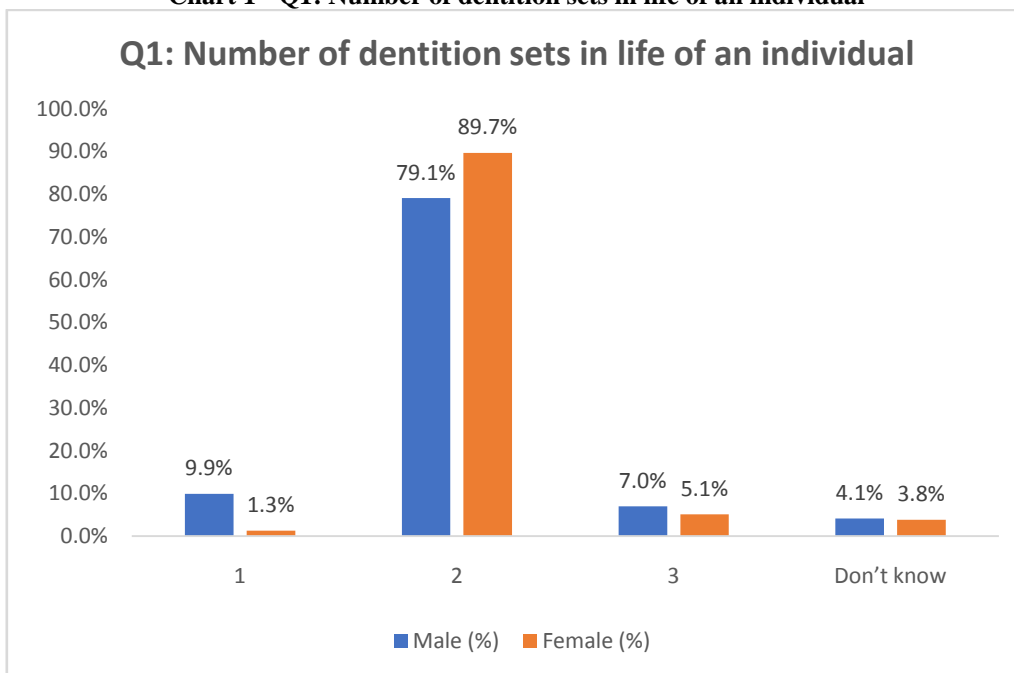


Chart 2 - Q2: Total number of deciduous and permanent teeth

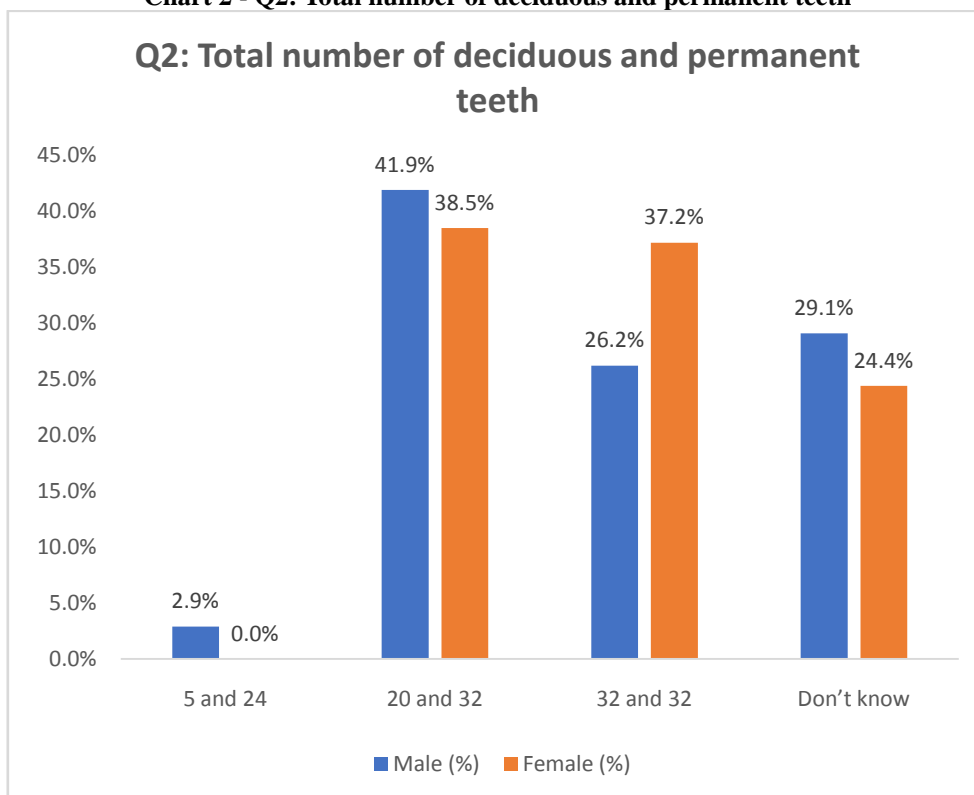




Chart 3 - Q3: Main purpose of tooth brushing

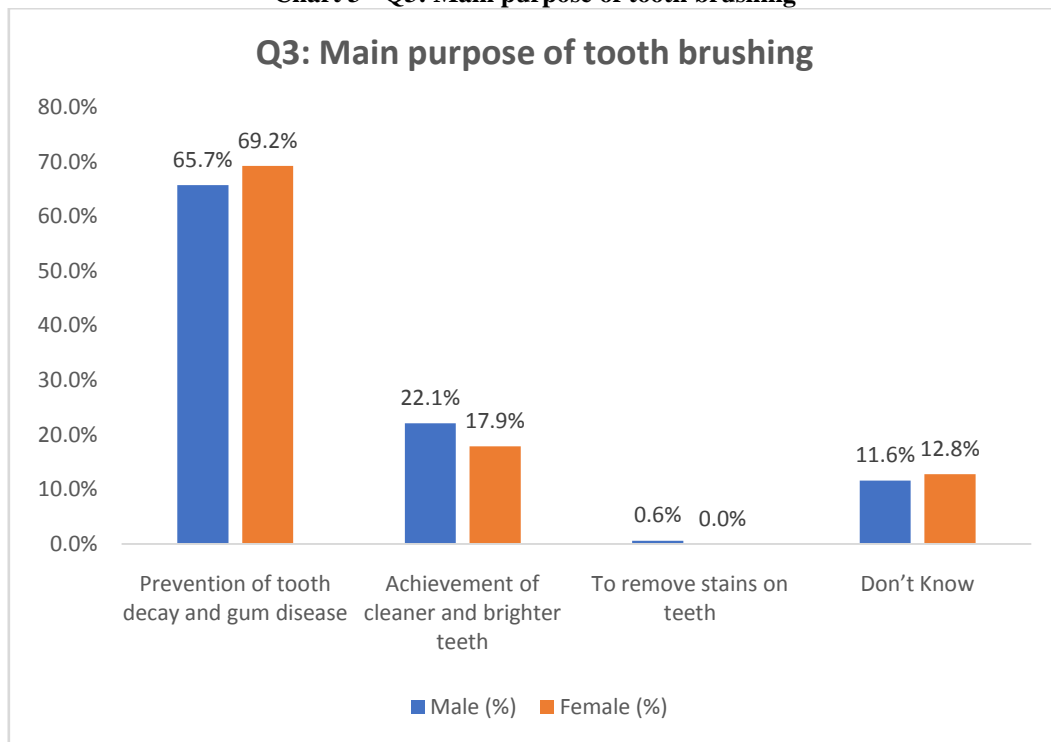


Chart 4 - Q4: Meaning of dental plaque

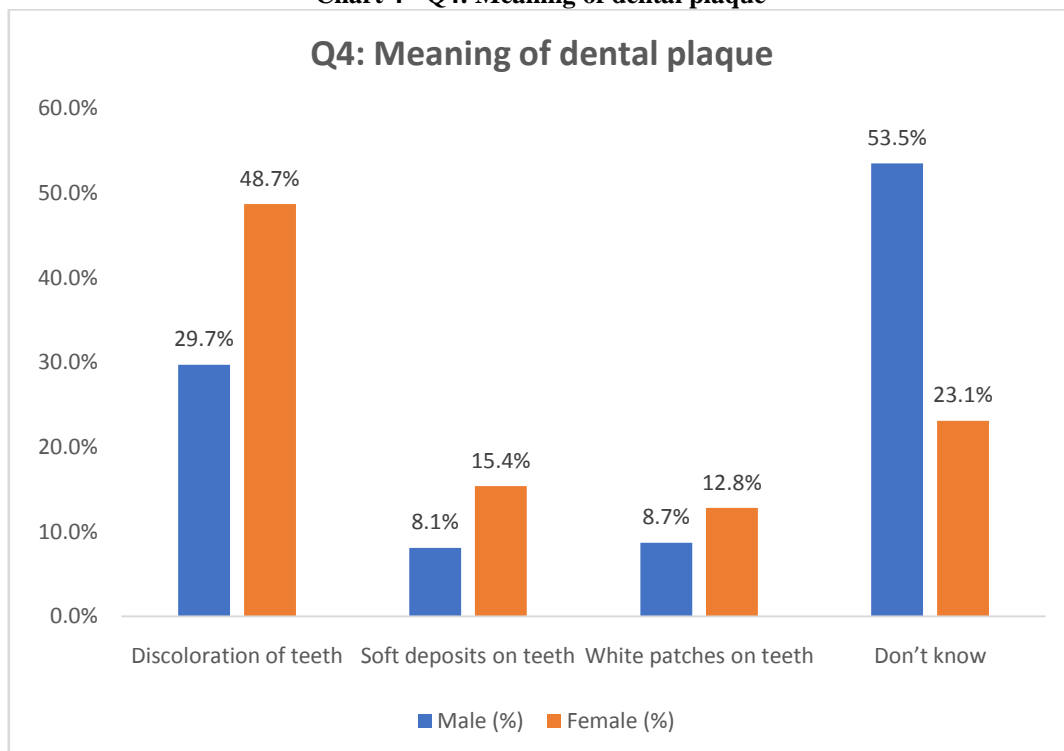




Chart 5 - Q5: Meaning of gum bleeding

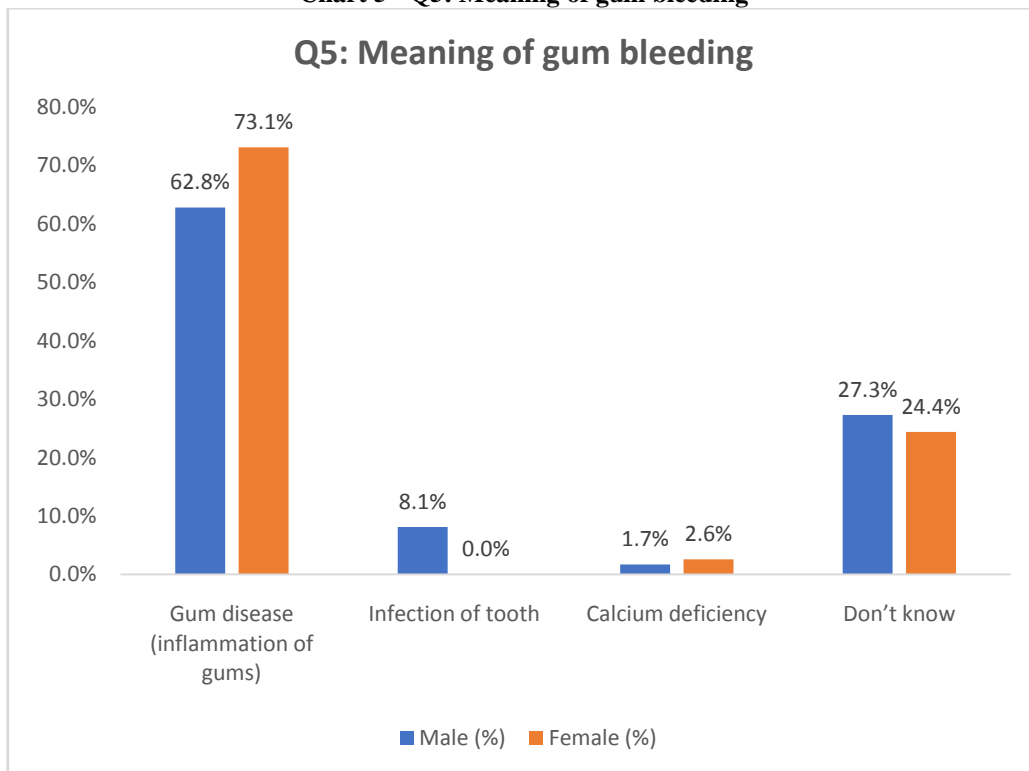


Chart 6 - Q6: Effect of retention of sweet food on teeth

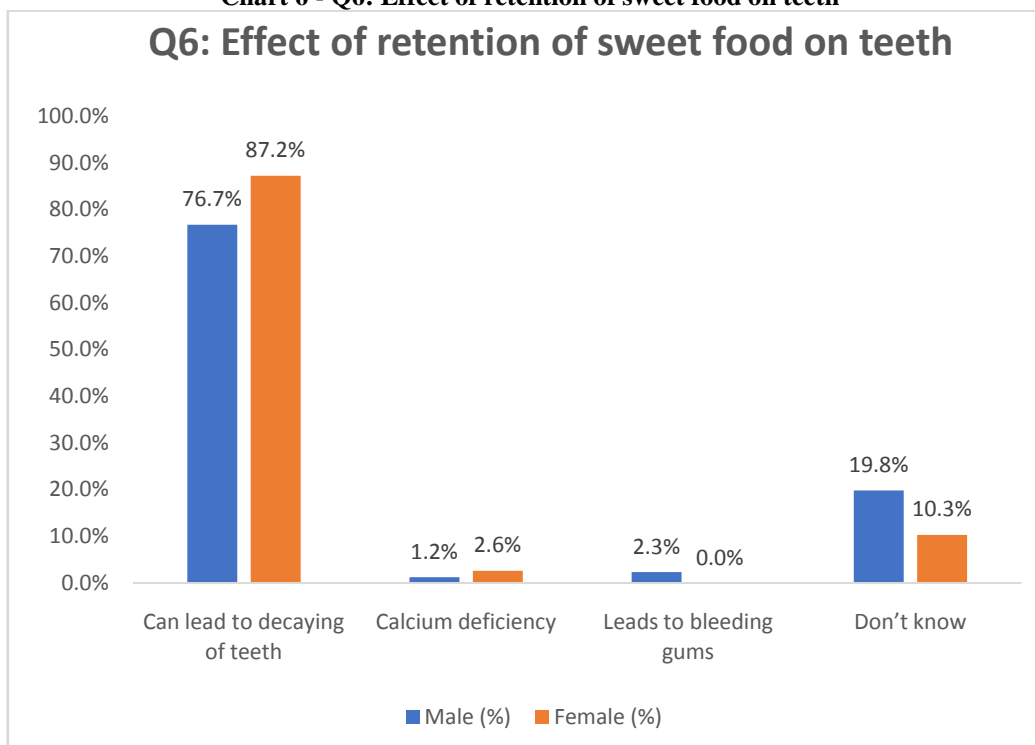




Chart 7 - Q7: Can health of teeth and mouth affect health of body

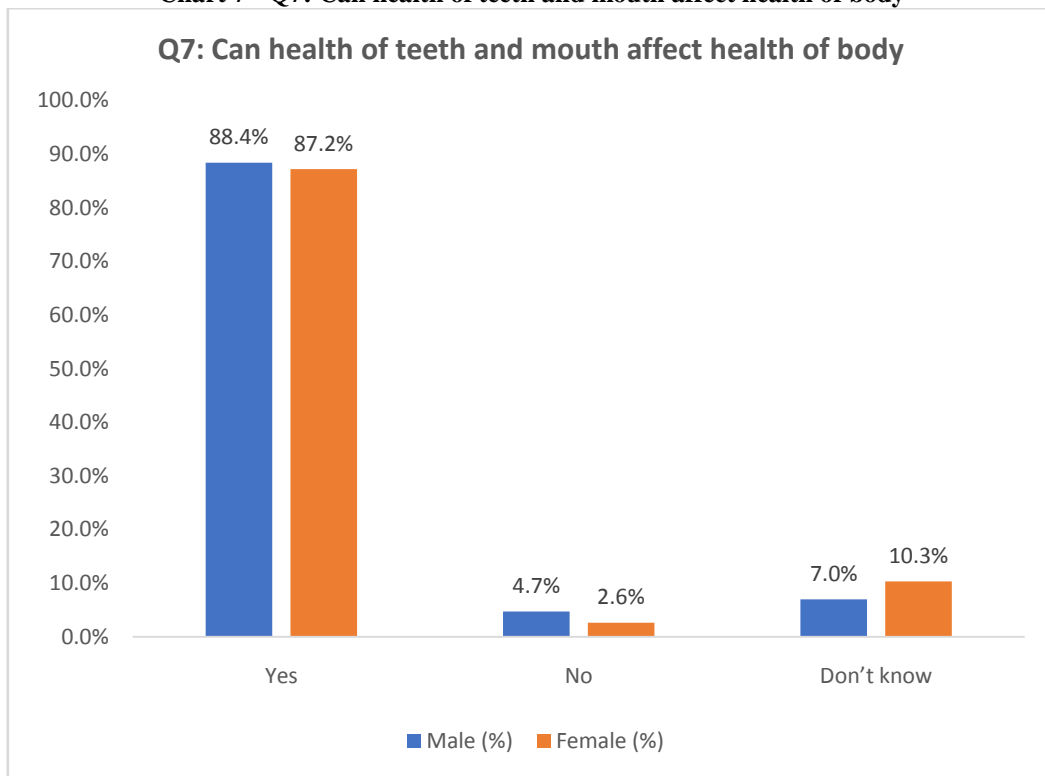


Chart 8 - Q8: Reasons for oral cancer

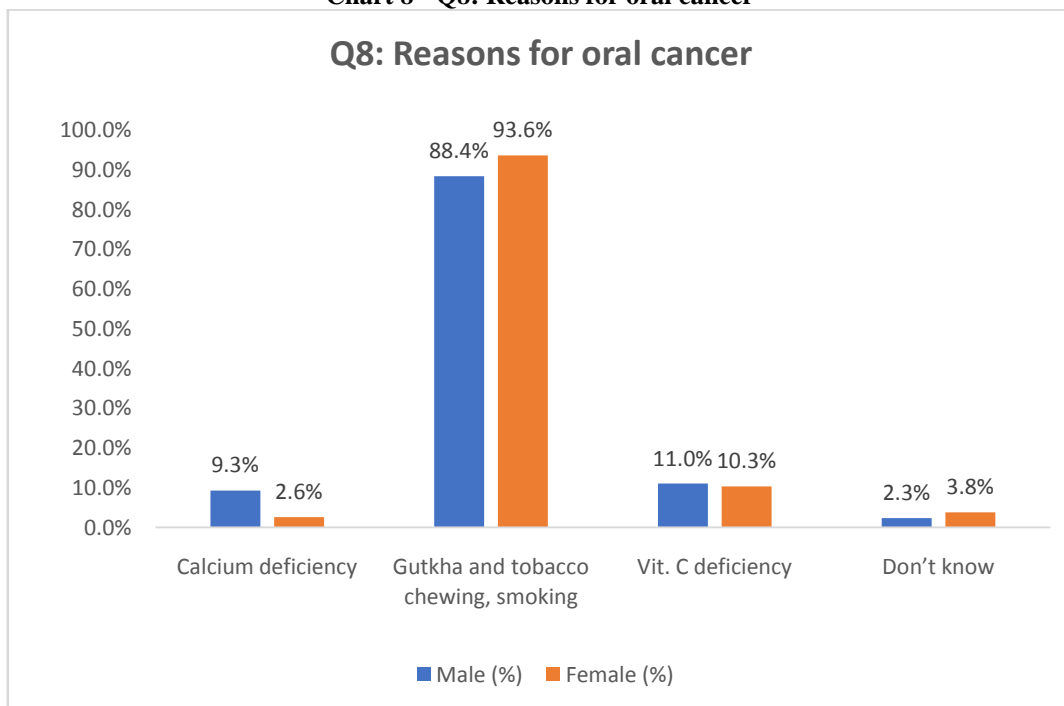




Chart 9 - Q9: Dentists should be visited regularly?

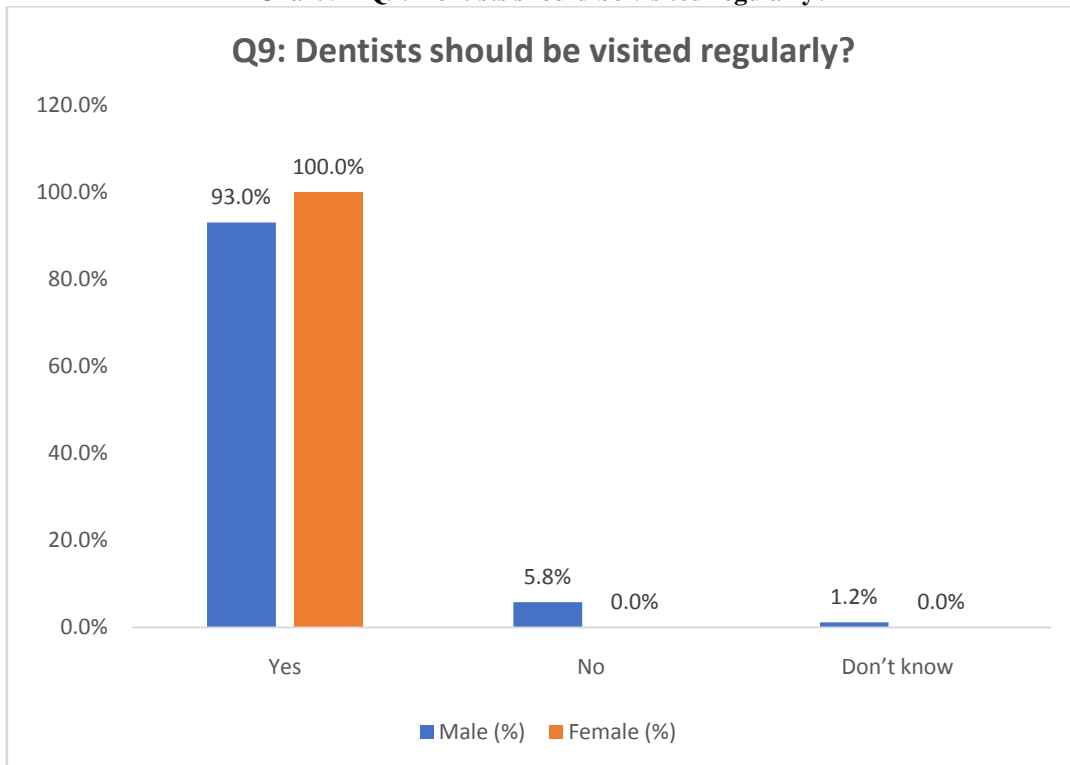


Chart 10 - Q10: Gutkha and tobacco chewing is a bad habit?

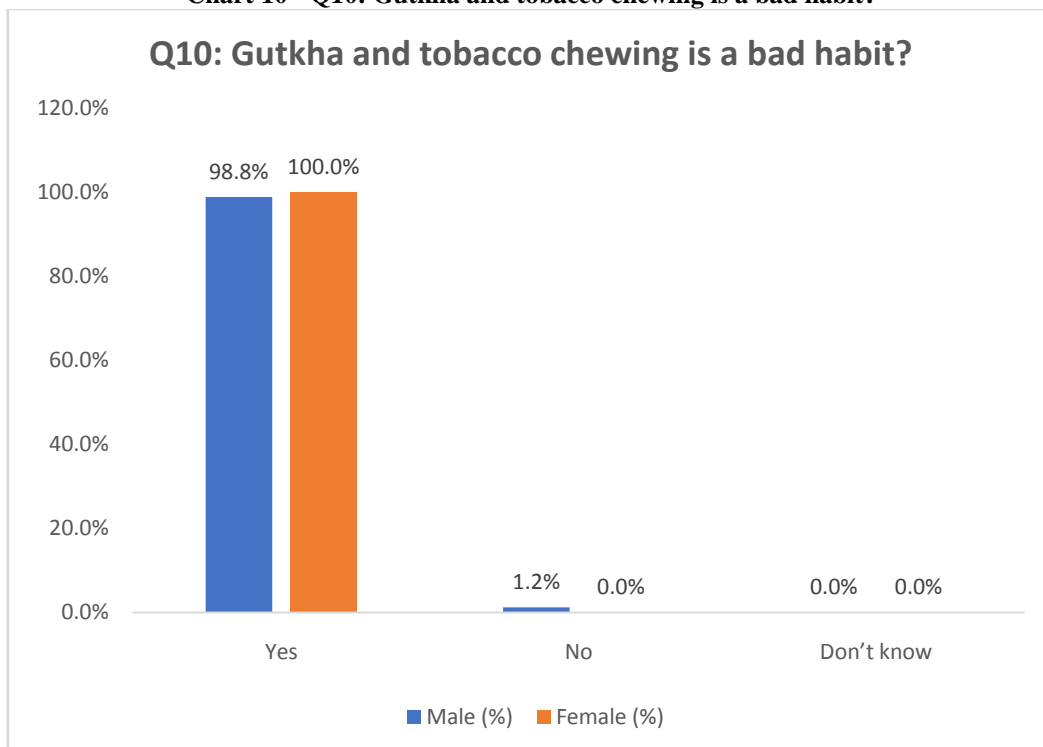




Chart 11 - Q11. Smoking in any form is a bad habit?

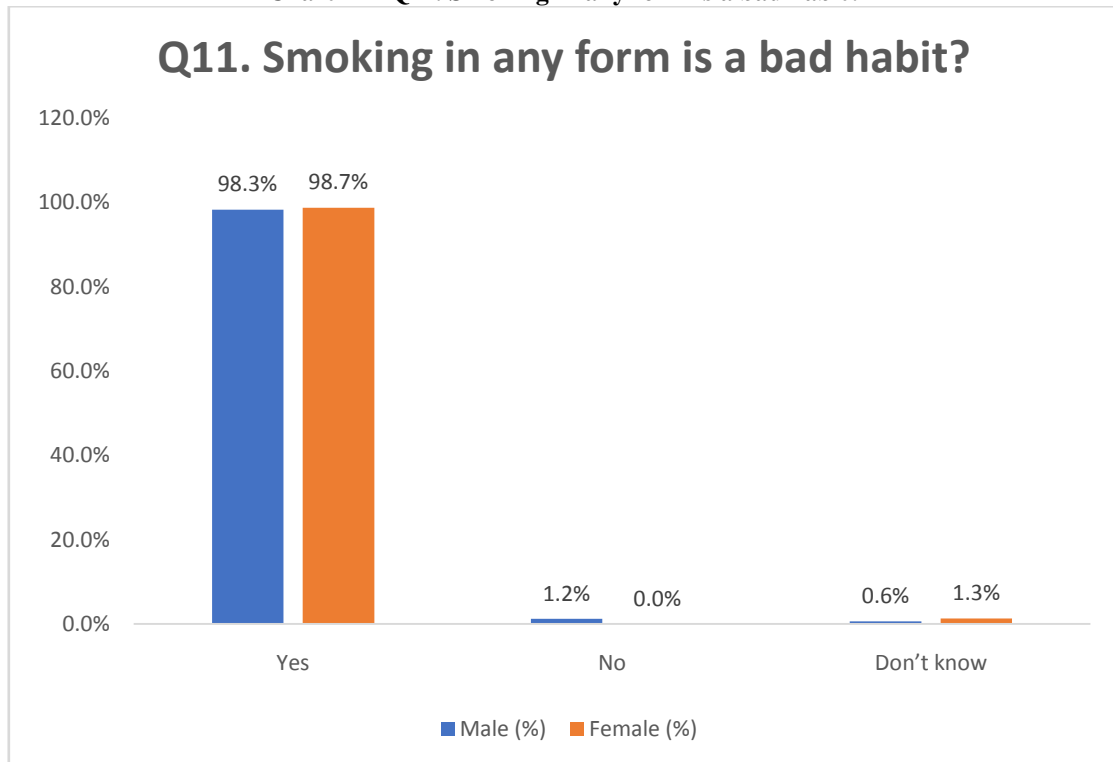


Chart 12 - Q12: Proper cleaning of teeth can be done without using toothpaste?





Chart 13 - Q13: Hardness of bristles of teeth has any effect on teeth and gums?

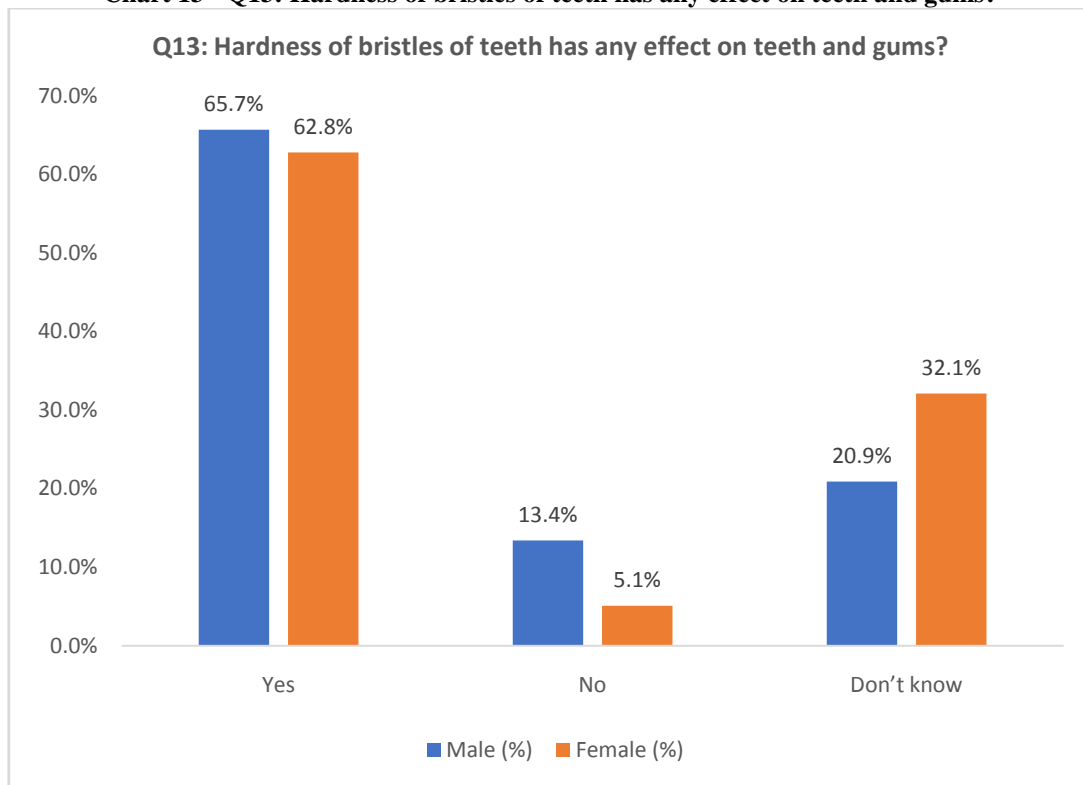


Chart 14 - Q14. Observed Bleeding from gums while brushing teeth?

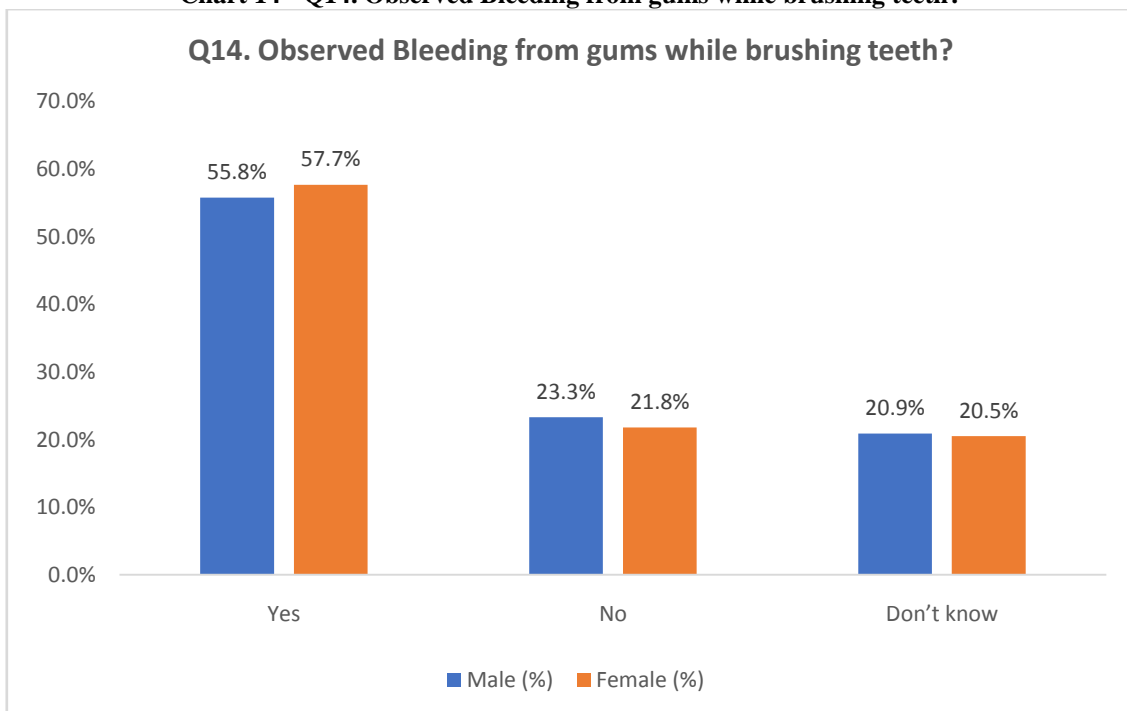




Chart 15 - Q 15: Immediate replacement of missing teeth by artificial teeth is necessary

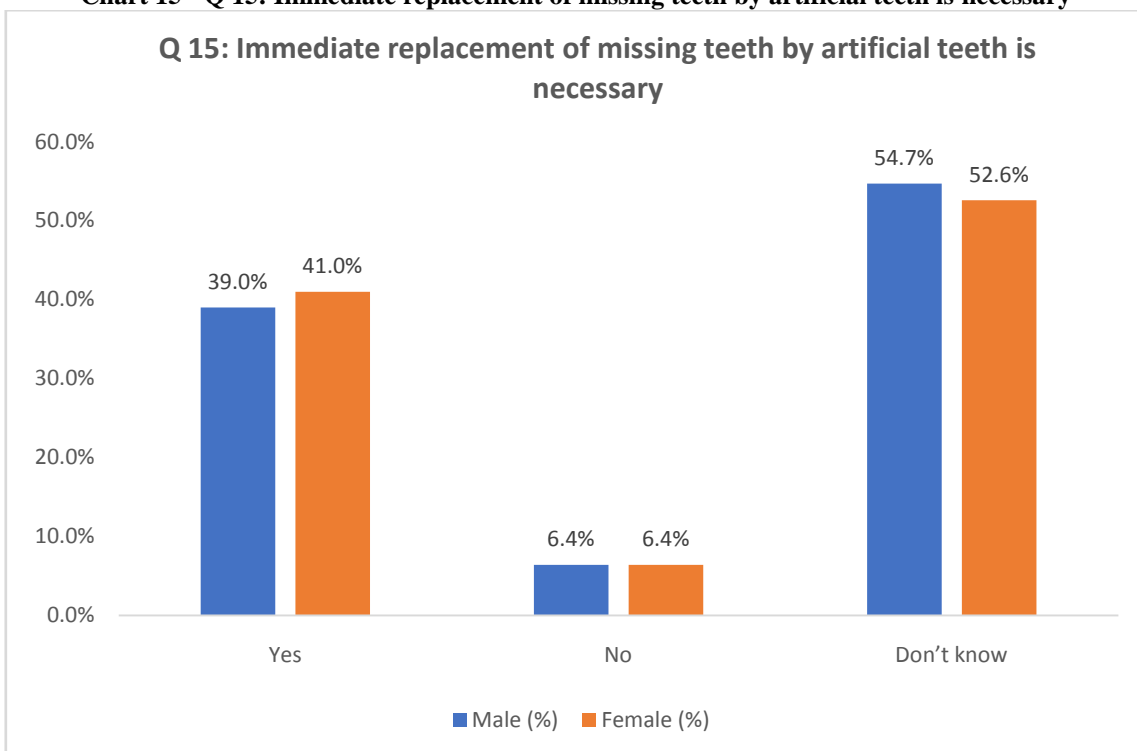


Chart 16 - Q16: Dentists play a role only in treatment, not prevention?

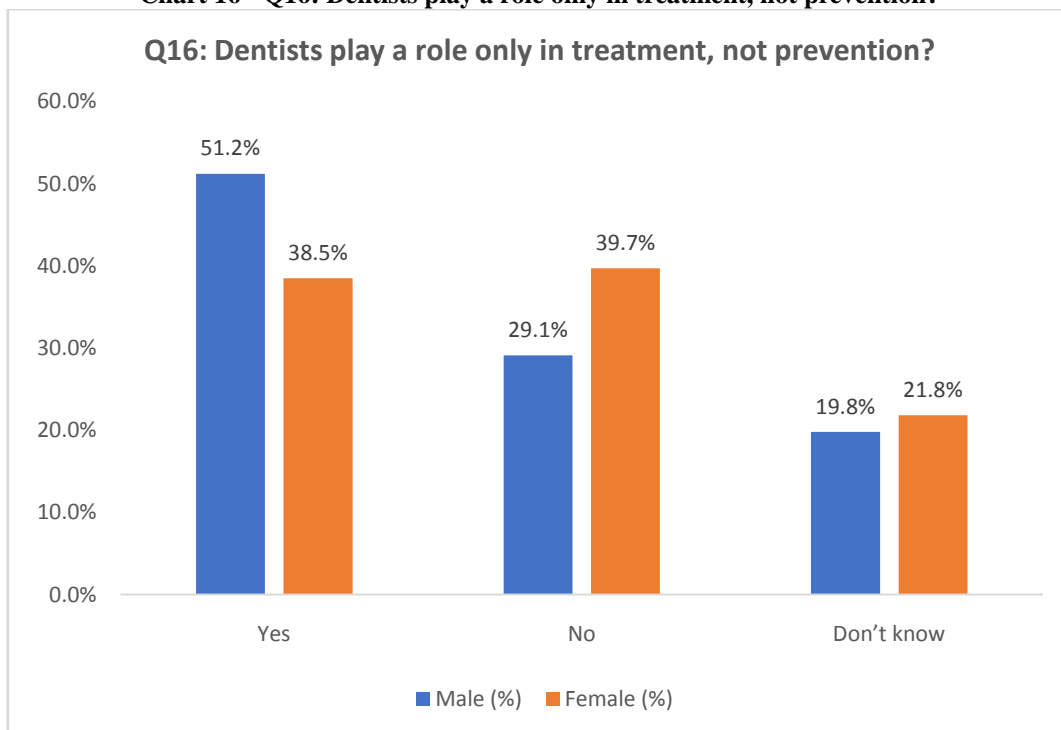
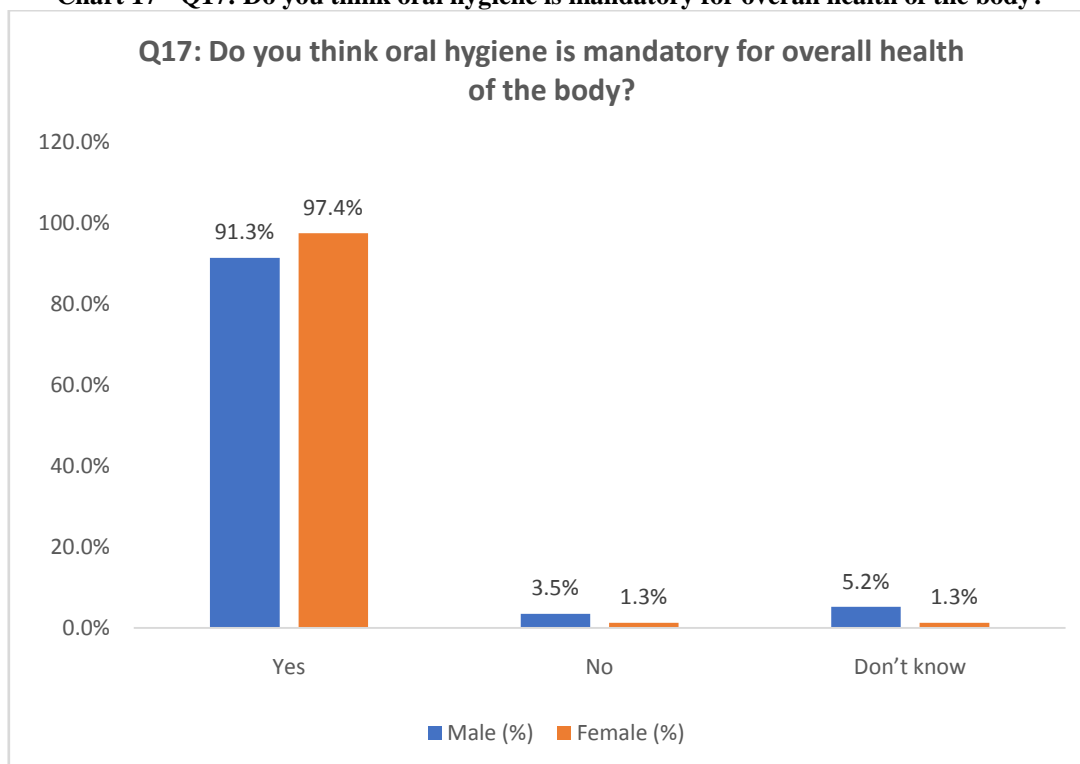




Chart 17 - Q17: Do you think oral hygiene is mandatory for overall health of the body?



IV. DISCUSSION

This cross-sectional questionnaire-based study aimed to assess oral health-related knowledge, attitudes, and practices among adults in rural Bhavnagar district. A total of 250 participants were surveyed to evaluate their understanding of oral hygiene and its impact on overall health.

The findings highlight a strong correlation between oral health and systemic conditions, including periodontal diseases and chronic illnesses such as diabetes and cardiovascular diseases (CVDs). Despite the well-established link between oral and systemic health, public awareness remains insufficient, contributing to misconceptions and the neglect of preventive dental care. Addressing this issue requires a comprehensive approach that integrates both preventive and therapeutic strategies. Raising awareness about periodontal disease prevention and promoting good oral hygiene practices is essential to reducing the risk of adverse health outcomes. Prioritizing education and preventive care can lead to better oral and overall health, ultimately enhancing the quality of life.

A significant knowledge gap regarding the relationship between oral health and systemic diseases persists among the general public. To rectify these misunderstandings or introduce new concepts, efforts must be directed toward

awareness, prevention, and therapeutic approaches. Proper knowledge of periodontal disease prevention is fundamental to achieving good oral health and avoiding undesirable consequences.^[8] The majority of participants in this study did not perceive periodontal diseases as requiring treatment, which may explain the high prevalence of periodontal diseases in the region, a trend consistent with findings by Al Qahtani et al.^[9]

Attitudes toward professional dental care varied by gender. Female participants demonstrated a more positive attitude toward their oral health compared to males. However, both genders showed reluctance toward regular dental visits. This trend aligns with the study conducted by Zhu et al.,^[10] where a significant proportion of participants had never visited a dentist. This reluctance was attributed to lower socioeconomic status, as the high cost of dental services often discourages individuals from seeking routine dental care. Many individuals delay dental visits until acute problems arise, exhausting all alternative methods before seeking professional intervention.^[11]

A multiple regression analysis by Addo Yobo et al.^[12] on oral hygiene among rural and urban populations demonstrated that social class significantly influences motivation and self-efficacy in maintaining oral health. This aligns closely with the present study's findings. Similarly,



a self-administered structured questionnaire study by Jain et al.^[13] in Jodhpur, India, revealed a severe lack of oral hygiene awareness and limited knowledge of proper oral hygiene practices.

Awareness of the causative factors for dental diseases,^[14] along with attitudes, oral health-related habits, and behaviors, plays a crucial role in determining oral health status. Socioeconomic status (SES) has been identified as a key factor influencing oral health behaviors, further emphasizing the need for targeted educational interventions to improve oral hygiene awareness.^[15,16]

V. CONCLUSION

This study established baseline data on oral hygiene knowledge and attitudes among the rural adult population of Bhavnagar district, specifically among patients visiting the College of Dental Science and Hospital, Amargadh. The findings highlight that oral hygiene remains an underemphasized aspect of healthcare in this population, contributing to various oral health challenges.

Analysis of the data revealed that female participants exhibited greater awareness, knowledge, and adherence to oral hygiene practices compared to males. Implementing a comprehensive approach to oral health promotion can enhance community well-being and encourage a culture of proactive dental care. Such efforts are essential for fostering long-term improvements, ultimately ensuring better oral health outcomes for future generations.

VI. LIMITATION

The study's limited sample size and cross-sectional design restrict its generalizability and ability to capture long-term trends. To improve the reliability and applicability of findings, future research should incorporate larger, more diverse populations and employ longitudinal methodologies to gain deeper insights into oral health behaviors and trends over time.

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