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Original Research Article

Impact of diet on oral health

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ABSTRACT

Aim: To assess the co relation between dietary habits and oral health conditions among the general population exploring the potential impact of various food choices on factors such as cavities, gum heath, and over all oral hygiene

Objectives: The primary objectives include: 1. Assess the frequency and types of food consumed by participants to identify patterns in dietary choices; 2. Examine the relationship between dietary sugar intake and the occurrence of dental cavities; 3. Explore the association between specific food groups and the development of oral health issues.

Materials and Methods: A comprehensive questionnaire consisting of 15 questions was designed and administered through Google Forms to collect data on oral hygiene practices. Participants aged 15 and above were randomly sampled, ensuring a diverse representation. The questionnaire focused on aspects such as type of diet, type of beverages and its frequency, frequency of snacking, water consumption, habits if any, carious tooth and gum diseases. Data collection was conducted through online responses.

Results: The survey results, obtained through Google Forms, revealed intriguing disparities in oral hygiene and impact of dietary preferences on various age groups. Variations were observed based on the quality and choice of diet, frequency of snacking, choice of beverages, water intake and habits if any.

Conclusion: In conclusion, this study, utilizing Google Forms for data collection, highlighted diversity in oral hygiene among individuals aged 15 and above. Recognizing these variations is crucial for tailoring oral health education programs and interventions to address the specific needs of different age groups. The findings underscore the importance of personalized oral care approaches and the impact of choice nutrition to promote optimal oral health across the population.

1. Introduction

Oral hygiene stands as a cornerstone of overall health, and the nexus between dietary habits and oral well-being has become increasingly apparent. Nutrition is an integral component of oral health, there is a continuous synergy between nutrition and the integrity of the oral cavity in health and disease.[1] Poor nutritional status can adversely affect oral health and poor oral health can influence dietary intake and subsequently lead to malnutrition and oral health can play a crucial role in maintaining good nutrition.[2]

In our fast-paced lifestyles, the ubiquity of fast food has soared, prompting a critical examination of its impact on oral health. Frequent consumption of simple carbohydrates, primarily in the form of dietary sugars, is significantly associated with increased dental caries risk[3] also the evidence shows that sugars are undoubtedly the most important dietary factor—and the factor studied most often—in the development of dental caries.[4]

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Bacteria that causes oral disease are affected by water intake, there is a strong relationship between water intake and oral disease.[5] Xerostomia causes the oral mucous membrane to become dry and fragile. Dentures are not well tolerated by this mucosa thereby causing loss of taste due to degeneration of the taste buds.[6]

Understanding the correlation between fast-food consumption and oral health is imperative for fostering awareness and promoting healthier dietary choices.

Beyond dietary considerations, habits like smoking and tobacco use causes a whole series of oral health problems, ranging from life-threatening (precancerous changes leading to oral cancer) and serious (periodontal disease, teeth decay) to social (bad breath).[7] The deleterious effects of these habits on oral tissues underscore the intricate relationship between lifestyle choices and oral hygiene.

Furthermore, the frequency of snacking, particularly on sugary treats, poses an additional challenge to oral health. The consistent exposure of teeth to sweetened juices were associated with primary and permanent dental caries.[8]

This survey seeks to delve into the multifaceted relationship between nutrition, fast-food consumption, sugar intake, smoking, tobacco use, and snacking habits, unravelling their collective impact on oral hygiene. By elucidating these interconnected factors, we aspire to provide valuable insights for individuals, healthcare professionals, and policy makers alike. Armed with this knowledge, we can develop targeted strategies to promote preventive measures and cultivate healthier behaviours, thereby contributing to enhanced oral health within our communities.

2. Materials and Methods

2.1. Study design and population

This survey employed a cross-sectional study design conducted in India. The study population comprised people of various age groups and of different states of India. The cross-sectional approach allowed for a snapshot assessment of the current awareness among people regarding influence of diet on oral health.

2.2. Questionnaire

A comprehensive questionnaire comprising 10 questions was developed to collect data on various aspects of oral hygiene practices. The questionnaire was administered through Google Forms, facilitating efficient and standardized data collection. Questions covered topics such as consumption of sugar, frequency of snacking, water consumption, types of beverages preferred, water intake, habits such as smoking and tobacco, teeth showing decay, gum diseases, and teeth sensitivity.

*2.3. **Statistical** analysis*

Data obtained from the Google Forms responses were subjected to thorough statistical analysis. Descriptive statistics, including frequencies and percentages, were employed to summarize the demographic characteristics and key variables related to oral hygiene practices.

3. Results

The study indicates that among the population that participated 50% showed vegetarian diet preference and milk consumption was seen in maximum of participating population (75%). Maximum amount of beverage was consumed by the age group of 21-30 years with 50% of them consumed 1-2 cups. 53.26% of participating population consumed 2 tablespoon of sugar. The amount of gum diseases and decayed teeth were seen more the age group of 21-30.

4. Discussion

The study's findings illuminate substantial variations in oral health practices among individuals aged 15 and above, shedding light on the impact of diet on oral well-being. Using a cross-sectional study design provided a snapshot of dietary habits across different age groups, contributing to a comprehensive understanding of observed variations. Noteworthy differences emerged in dietary choices, frequency of consumption, and the impact on oral health indicators. It was observed that adolescents had an unhealthy beverage intake pattern[9] which causes changes in the enamel surface which could be observed, as well as decreases in hardness due to the acidic environment within the mouth[10] also there is a consensus that carbohydrates, especially dietary sugars, determine whether caries develops or not.[11]

From traditional food items to modern dietary patterns, participants exhibited a wide spectrum of preferences, emphasizing the importance of recognizing individual dietary habits in designing interventions for oral health.

Diet is a major aetiological factor for dental caries and enamel erosion, and nutritional status impacts on the development of the teeth and the host's resistance to many oral conditions, including periodontal diseases and oral cancer.[12]

Nutrition affects the teeth during development and malnutrition may exacerbate periodontal and oral infectious diseases[13] therefore the revealed trends deserves attention in public health initiatives. Cigarette smoking initiates and leads to progression of periodontitis which eventually leads to loss of teeth.[14]

Due to ingestion of large amounts of alcohol there is marked presence of dental erosion which is due to subclinical regurgitation because of chronic gastritis. Bruxism due to alcohol consumption results in stimulation

Table 1: Survey analysis

	Age Group							
Title	**12-20**	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-80**	**Grand Total**	Percentage
Vegetarian	33	59	11	8	5	0	3	119	17.05%
Non vegetarian	14	39	9	7	4	1	0	74	10.60%
Milk	27	56	13	6	5	0	1	108	15.47%
Smoke	1	3	3	0	1	1	0	9	1.29%
Tobacco chewer		3	2		2	1		8	1.15%
Decayed teeth	10	29	12	3	3	1	2	60	8.60%
Bleeding gums		7				1		8	1.15%
Sensitivity/pain in your teeth	7	24	4	3	2	2		42	6.02%
Alcohol	7	18	8	6	4	1		44	6.30%
Snacks	35	84	12	13	5	1		150	21.49%
Plaque in your mouth	5	27	17	15	9	1	2	76	10.89%

Table 2: Tea/Coffee/ Beverage

	Age Group								
Tea/Coffee/ Beverage	12-20	21-30	31-40	41-50	51-60	61-70	71-80	**Grand Total**	**Percentage**
1-2	**25**	54	3	10	2		3	97	59.51%
2-3	9	21	12	2	3			47	28.83%
Above 3	4	6	3	2	3	1		19	11.66%

Table 3: Sugarintake

	Age Group								
Sugar	**12-20**	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-80**	**Grand Total**	**Percentage**
2 tablespoon	24	54	8	7	2		3	98	53.26%
3-4 tablespoon	12	34	5	6	3			60	32.61%
4-5 tablespoon	7	9	5	2	2	1		26	14.13%

Table 4: Water

	Age Group								
Water	**12-20**	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-80**	**Grand Total**	**Percentage**
1-2 litre	24	34	6	11	3		3	81	57.45%
2 litre	6	13	3	3	2			27	19.15%
Less than 1 litre	7	20	3	1	1	1		33	23.40%

of the brainstem reticuloactivatory system producing masseteric muscle contractions during rapid eye movement in sleep. This mechanism produces attrition, i.e. with flat wear facets on the surfaces of opposing teeth which actually contact each other in some excursion of the mandible. [15]

Despite certain dietary preferences' popularity, further research is needed to assess their specific impact on oral health.

The study utilized an efficient approach for data collection, minimizing biases associated with face-to-face interviews. However, reliance on self-reported data introduced potential recall bias, and the cross-sectional design hindered establishing causal relationships, underscoring the need for future longitudinal investigations.

Subgroup analyses across different age groups unveiled intriguing patterns in dietary habits and their association with oral health, suggesting tailored education programs for specific cohorts. The study's implications for public health strategies emphasize the importance of personalized approaches considering individual dietary preferences. Future research could explore socio-economic, cultural, and educational influences on dietary choices affecting oral health to develop more nuanced interventions.

In conclusion, this study underscores the dynamic relationship between diet and oral health, advocating for tailored interventions to address diverse dietary preferences among individuals aged 15 and above. These insights contribute to ongoing discussions on effective oral health

promotion, urging strategies that resonate with the unique dietary needs of different demographic groups.

5. Conclusion

In conclusion, this study reveals the intricate link between diet and oral health practices among individuals aged 15 and above. The cross-sectional design offers nuanced insights into diverse dietary habits, emphasizing the need for personalized interventions. Variations in dietary choices, consumption frequencies, and their impact on oral health indicators underscore the complexity of addressing individual well-being. Trends like the consumption of acidic or sugary foods suggest potential areas for targeted public health initiatives, requiring further research to fully understand their implications. While the study's online data collection is efficient, caution is needed due to potential recall bias from self-reported data. Future longitudinal investigations are crucial to establishing causal relationships. Subgroup analyses highlight age-specific patterns, advocating for tailored education programs considering socio-economic, cultural, and educational influences on dietary choices impacting oral health. These findings contribute significantly to discussions on effective oral health promotion, emphasizing the necessity for strategies aligned with the diverse dietary needs of various demographic groups.

6. Source of Funding

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7. Conflict of Interest

None.

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