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Original Research Article

Assessment of dental bur sterilization awareness among general dentists in Uttarakhand

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ABSTRACT

Aim: This study assesses general dentists' knowledge and adherence to dental bur sterilization practices in Uttarakhand, aiming to enhance patient safety and clinical precision by identifying implementation gaps.**Objectives:** Evaluate practitioners' understanding of optimal sterilization protocols for burs, pinpoint areas for improvement, and establish a baseline of current practices in general dentistry.**Materials and Methods:** A state-wide distribution of a structured questionnaire gathered responses from 237 general dentists. The survey focused on sterilization equipment usage, frequency, and compliance with industry guidelines. Quantitative data were analyzed for insights into current practices.**Results:** Preliminary findings show varying awareness and adherence levels among practitioners. While a significant proportion demonstrated commendable knowledge, specific gaps and deviations were identified, suggesting areas for improvement.**Conclusion:** Continuous education and reinforcement of best practices in bur sterilization are crucial within the general dentistry community. Addressing identified gaps can elevate the standard of care, ensuring patient safety and precision in dental procedures. Ongoing education and awareness campaigns are vital for sustained improvement in bur sterilization practices.This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.For reprints contact: reprint@ipinnovative.com

1. Introduction

Dental burs, indispensable tools in dentistry, wield crucial significance in procedures such as cavity preparation and crown adjustment, reflecting their versatile role. Their precise functionality directly impacts treatment quality, necessitating meticulous care and maintenance.¹⁻⁵ Used across specialties like restorative, endodontic, and surgical procedures, dental burs efficiently remove dental tissues, contributing to optimal clinical outcomes. However, their efficacy hinges on stringent sterilization practices to ensure patient safety and prevent cross-contamination in the dental operatory.⁶

The widespread use of dental burs, coupled with the risk of cross-contamination, underscores the importance of robust infection control measures, specifically tailored to their sterilization. The intricate design of burs requires meticulous attention during the sterilization process, making adherence to standardized protocols imperative for upholding the highest standards of patient care.^{7,8}

This study aims to assess general dentists' knowledge and adherence to effective sterilization practices for dental burs in Uttarakhand. Recognizing the pivotal role dental burs play and the potential risks associated with improper sterilization, our research seeks to contribute valuable insights into current practices, identifying areas for improvement.⁹ By enhancing awareness and education in bur sterilization, we aim to elevate patient safety

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and precision in dental procedures, fostering continuous improvement within the general dentistry community.¹⁰

As we delve into the multifaceted world of dental burs, exploring their applications and emphasizing the critical need for proper sterilization, this research endeavors to advance the ongoing dialogue on safe and effective utilization. The study's outcomes will not only benefit individual practitioners but also contribute to broader discussions on infection control in dental settings.^{11–13}

2. Material and Methods

2.1. Study design and population

This cross-sectional study, conducted in Uttarakhand, India, aimed to assess general dentists' awareness and practices regarding bur sterilization. The study included practitioners from private practices, dental clinics, and dental college residents, allowing for a comprehensive snapshot of the current scenario.

2.2. Questionnaire

A meticulously designed structured questionnaire served as the primary data collection tool. The survey covered sterilization equipment usage, adherence to guidelines, and overall knowledge on bur sterilization. Questions accommodated diverse perspectives, considering both experienced practitioners and dental college residents. The questionnaire, distributed physically and electronically, ensured broad accessibility.

Duration and Ethical Considerations: The survey spanned for over three months. Prior to commencement, ethical considerations were paramount. An institutional review board approved the study, ensuring compliance with ethical guidelines. Informed consent was obtained from all participants, emphasizing voluntary participation and confidentiality.

2.3. Questionnaire details

The questionnaire encompassed key demographic information (name, age, qualification, and years of practice). Qualifications ranged from BDS students to MDS practitioners, with experience categorized into three groups. Questions assessed awareness of bur sterilization, preferences post-bur usage (sterilization or replacement), and the preferred method of sterilization (chairside, autoclave, ultrasonic bath). Additionally, respondents identified procedures causing faster wear and tear of burs and reported problems encountered during sterilization, such as rusting/corrosion and early burnout.

2.4. Validation

The questionnaire underwent a validation process involving dental professionals and experts to ensure content relevance

and clarity. Pilot testing was conducted on a small sample, refining questions based on feedback. This process enhanced the instrument's reliability and validity.

2.5. Statistical analysis

Collected data underwent rigorous quantitative analysis using statistical tools. Descriptive statistics were employed to characterize the demographic profile of respondents, while inferential statistics were utilized to draw associations and identify patterns related to bur sterilization practices. The analysis aimed to provide a comprehensive overview of the current landscape, highlighting areas of strength and potential improvement in sterilization awareness and implementation.

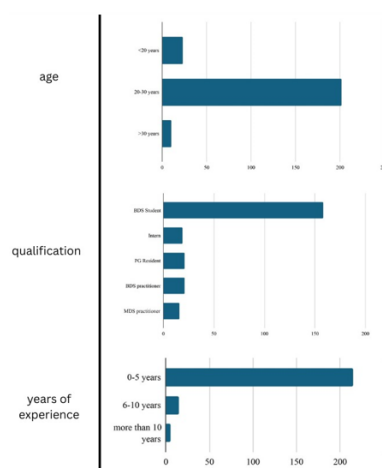


Figure 1:

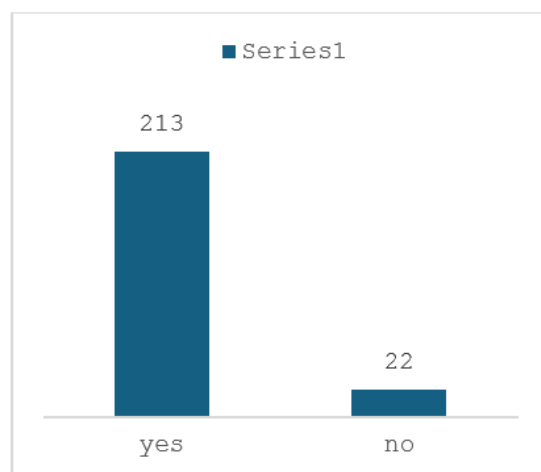


Figure 2: Awareness about bur sterilisation

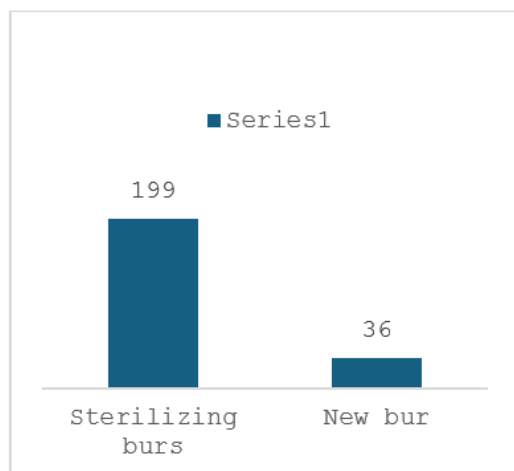


Figure 3: Preference

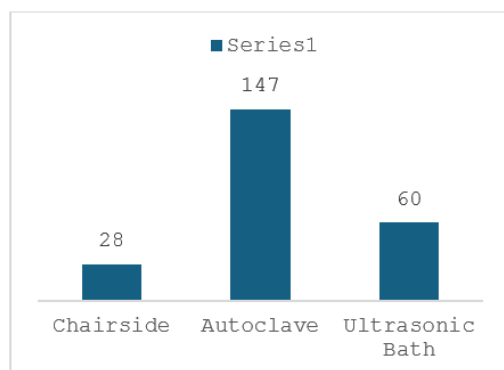


Figure 4: Sterilization method

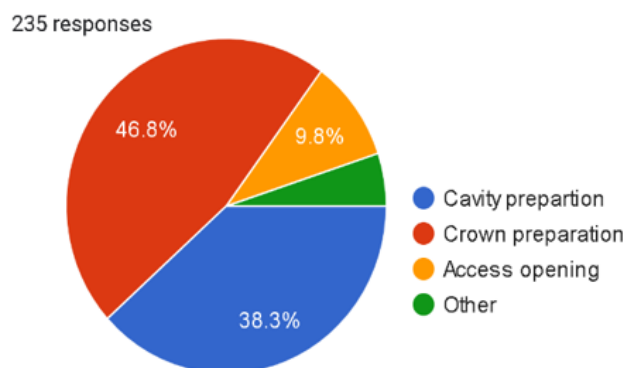


Figure 5: According to you, which dental procedure brings about faster wear and tear of burs?

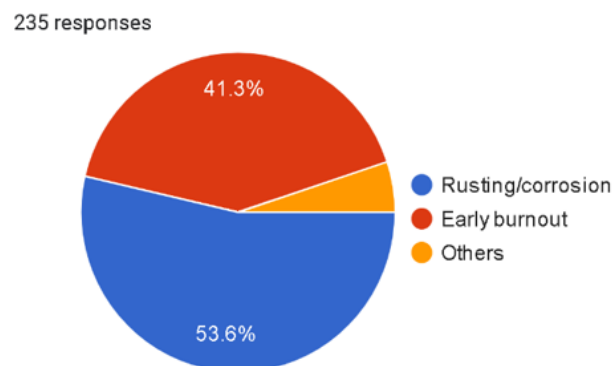


Figure 6: What problem do you often face with bur sterilization?

3. Results

Key findings from the survey conducted among dental practitioners in Uttarakhand revealed diverse levels of awareness and adherence to standardized sterilization procedures for dental burs. The data underscored specific areas of concern, indicating potential gaps in knowledge within the surveyed population. Notably, a significant portion of respondents demonstrated commendable awareness, while identified deviations highlighted the need for targeted educational interventions

1. Awareness Disparities: While a notable portion of practitioners displayed commendable awareness of sterilization procedures, the study identified variations in knowledge levels across the surveyed group.
2. Adherence Concerns: Deviations from standardized sterilization protocols were observed in certain practices, emphasizing the importance of consistent adherence to ensure optimal infection control.
3. Educational Needs: The findings underscored the necessity for targeted educational interventions to bridge knowledge gaps, particularly in areas where deviations from best practices were noted.

These key findings serve as a foundation for recommendations aimed at improving infection control measures in dental settings. By addressing identified disparities and emphasizing targeted educational initiatives, the study aims to contribute to the ongoing dialogue on enhancing bur sterilization practices in general dentistry, ultimately promoting patient safety and precision in dental procedures.

4. Discussion

This study delves into the critical intersection of infection control and dental care by examining bur sterilization practices within Uttarakhand's dental community. The findings shed light on varying degrees of awareness and

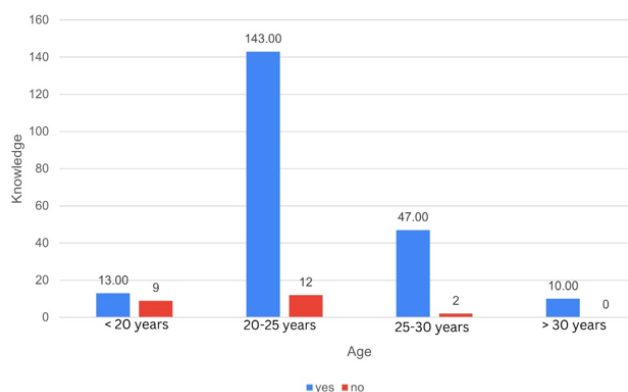


Figure 7: Variation of knowledge levels among various age groups

deviations from standardized sterilization procedures among practitioners, underlining the need for targeted educational interventions. The study's significance extends beyond mere assessments; it encompasses broader implications for patient safety and healthcare quality.⁶

Notably, the survey's key findings reveal that a substantial portion of practitioners exhibited commendable awareness of sterilization procedures. However, the identified deviations emphasize the importance of consistent adherence to best practices. The study underscores the imperative for targeted educational interventions to establish a more uniform understanding and implementation of sterilization protocols, particularly given the diverse levels of awareness observed.^{8,14}

One significant revelation pertains to awareness disparities, especially among dental college residents. This signals a critical need for early educational interventions to instill a robust foundation for infection control practices from the onset of practitioners' careers. Recognizing the diverse experience levels of participants, categorized into BDS students, interns, PG residents, BDS practitioners, and MDS practitioners, further enhances the study's ability to provide nuanced insights.¹⁵

The stratified sampling approach and collaboration with dental associations and institutions ensure the study captures a diverse representation of Uttarakhand's dental landscape. This inclusivity not only strengthens the generalizability of the findings but also enables interventions tailored to the unique challenges faced by different practitioner groups and across various settings.¹⁶

The meticulous design of the questionnaire, encompassing aspects from equipment usage to adherence with guidelines, facilitates a nuanced examination of the factors influencing sterilization practices. Findings reveal practitioners' preferences for sterilization methods, with variations observed among chairside, autoclave, and ultrasonic bath methods. Perceptions on dental procedures leading to faster wear and tear of burs provide valuable

insights into practitioners' perspectives, further contributing to the study's depth.⁹

Practical challenges during bur sterilization, such as rusting/corrosion and early burnout, were also explored, offering a holistic understanding of the barriers faced by practitioners. This comprehensive approach allows for the development of targeted and effective interventions, addressing specific challenges identified in the study.^{10,11}

Beyond the specific findings, this research significantly contributes to ongoing discussions on infection control in dental settings. Rigorous sterilization practices resonate with broader discussions on patient safety and healthcare quality, emphasizing the pivotal role in maintaining high standards of patient care and clinical precision. By addressing identified gaps and building upon existing strengths, the dental community in Uttarakhand can collectively elevate its infection control practices, fostering a safer and more robust healthcare environment. This study serves as a catalyst for ongoing education and awareness initiatives, encouraging a culture of responsibility and excellence within the dental profession, ultimately contributing to a safer and more robust healthcare environment for practitioners and patients alike.¹²

5. Conclusion

In conclusion, this study serves as a crucial exploration of the integral link between infection control and dental care, with a specific focus on bur sterilization practices in Uttarakhand. The observed diversity in awareness levels among practitioners underscores the necessity for targeted educational interventions, particularly among dental college residents who represent a key demographic. The comprehensive survey approach, inclusive questionnaire design, and meticulous statistical analysis collectively provide valuable insights into the current state of bur sterilization practices in the region.

The practical implications of these findings for dental practice in Uttarakhand are far-reaching. The identified gaps in awareness and adherence to standardized sterilization procedures suggest a need for immediate and focused educational initiatives. For dental college residents, early integration of robust infection control education into their training programs is essential to establish a strong foundation for responsible clinical practices.

Based on the study's conclusions, several recommendations can be proposed to enhance infection control practices in the region. Firstly, the development and implementation of targeted educational programs, specifically tailored to address the identified knowledge gaps, should be prioritized. These programs can encompass regular workshops, seminars, and continuous education sessions to ensure ongoing awareness and skill development among practitioners.

Additionally, collaborative efforts between dental associations, institutions, and regulatory bodies can play a pivotal role. By fostering partnerships, these entities can collectively work towards establishing standardized guidelines and protocols for bur sterilization. This collaborative approach ensures a unified commitment to maintaining the highest standards of infection control across different dental settings in Uttarakhand.

Moreover, the study emphasizes the need for continuous monitoring and evaluation of sterilization practices. Regular audits and assessments can help identify evolving challenges and ensure the sustained effectiveness of implemented interventions. This proactive approach not only contributes to the immediate improvement of practices but also establishes a culture of ongoing improvement within the dental profession.

In essence, the study's findings advocate for a comprehensive and sustained effort towards enhancing infection control practices in Uttarakhand's dental community. By addressing the identified gaps through targeted education, collaborative initiatives, and continuous monitoring, the dental profession in the region can fortify patient safety, elevate clinical precision, and contribute significantly to broader healthcare quality discussions. The study serves as a catalyst for positive change, promoting a culture of responsibility and excellence within the dental profession in Uttarakhand.

6. Ethical Considerations

Before initiating data collection, ethical approval was obtained from an institutional review board to ensure compliance with established ethical guidelines. Participants were informed about the study's purpose, procedures, and potential risks, and their voluntary participation was emphasized. Informed consent was obtained from all respondents, affirming their willingness to take part in the survey. To safeguard participant confidentiality, all collected data were anonymized and securely stored, ensuring that individual responses remained confidential.

7. Conflicts of Interest

There are no conflicts of interest.

8. Source of Funding

None.

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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.This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.For reprints contact: reprint@ipinnovative.com

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 risk³also 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 pattern⁹ which causes changes in the enamel surface which could be observed, as well as decreases in hardness due to the acidic environment within the mouth¹⁰ 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 diseases¹³ 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

Title	Age Group							Grand Total	Percentage
	12-20	21-30	31-40	41-50	51-60	61-70	71-80		
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

Tea/Coffee/ Beverage	Age Group							Grand Total	Percentage
	12-20	21-30	31-40	41-50	51-60	61-70	71-80		
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

Sugar	Age Group							Grand Total	Percentage
	12-20	21-30	31-40	41-50	51-60	61-70	71-80		
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

Water	Age Group							Grand Total	Percentage
	12-20	21-30	31-40	41-50	51-60	61-70	71-80		
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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Original Research Article

Knowledge, Attitude and perception of anxiety and stress among undergraduate dental students

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ABSTRACT

Objective: This research endeavours to examine the levels of knowledge, attitude, and perception related to anxiety and stress among undergraduate dental students. The challenging and demanding nature of dental education may contribute to elevated stress levels among students, making it imperative to comprehend the factors influencing anxiety and stress. This study aims to provide insights that can guide the development of targeted interventions to enhance the mental well-being of dental students.

Materials and Methods: A cross-sectional study was conducted using a structured questionnaire to gather data from undergraduate dental students. The questionnaire encompasses demographic details, academic-related stressors, awareness of mental health resources, coping mechanisms, and perceptions regarding anxiety and stress in dental education. The data was subjected to statistical analysis to identify patterns and associations.

Results: Findings include revelations about the prevalence and severity of anxiety and stress among dental students, factors contributing to heightened stress levels, and the efficacy of existing coping mechanisms. The study also aims to assess the awareness and utilization of mental health resources within the dental education community.

Conclusion: This research aims to contribute valuable insights to the existing body of literature on the mental health of undergraduate dental students. The results may inform educational institutions and policymakers about potential areas for improvement in support services and interventions to alleviate anxiety and stress levels among dental students. Ultimately, enhancing the overall well-being of dental students is crucial for their academic success and personal growth.

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1. Introduction

In the realm of higher education, the pursuit of dental education is renowned for its demanding and rigorous nature, often subjecting students to heightened levels of stress¹ and anxiety. The intricate balance between academic responsibilities, clinical requirements, and personal well-being places dental students at the nexus of challenges that can significantly impact their mental health. As the

importance of addressing mental health concerns within academic settings gains recognition, it becomes imperative to delve into the knowledge, attitude, and perceptions surrounding anxiety and stress among undergraduate dental students.²⁻⁴

This research aims to fill a crucial gap in the existing literature by conducting a cross-sectional study that systematically investigates the multifaceted aspects of anxiety and stress within the context of dental education. Current research focusing on the mental well-being of dental students in India is limited. This study investigates

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the anxiety and stress levels experienced by undergraduate dental students of our state that is Uttarakhand, including those in clinical and pre-clinical stages. Additionally, it explores coping mechanisms and strategies to alleviate workplace stress. By examining these factors, the study aims to illuminate the challenges faced by dental students and offer practical recommendations to improve their mental health. This research contributes valuable insights into the mental health landscape within the Indian dental student community.

The primary aim of this study is to evaluate anxiety and stress levels^{5,6} among undergraduate dental students. By comprehensively exploring the levels of awareness, attitudes towards mental health resources, and individual perceptions of stressors,⁷ this study endeavours to provide nuanced insights that can inform tailored interventions and support systems.

The significance of this research lies in its potential to shed light on not only the prevalence and severity of anxiety and stress among dental students but also on the effectiveness of current coping mechanisms^{8–10} and the utilization of available mental health resources. By fostering a deeper understanding of these dynamics, educational institutions and policymakers can formulate targeted strategies to enhance the overall well-being of undergraduate dental students.

In the subsequent sections, we will detail the methodology⁷ employed in this cross-sectional study, present the anticipated findings, and discuss the implications of the research in the broader context of promoting mental health and resilience among dental students.

1.1. Inclusion criteria

1. Undergraduate dental students enrolled in accredited dental institutions in India.
2. Both clinical and pre-clinical students are eligible.
3. All genders and age groups of students are considered.
4. Voluntary participation and informed consent from students are required.
5. Anonymous filling of questionnaire.

1.2. Exclusion criteria

1. Postgraduate dental students.
2. Severe cognitive impairments or language barriers. preventing questionnaire completion.
3. Students who decline participation or withdraw consent.

2. Materials and Method

2.1. Study design

This research adopted a cross-sectional study design¹¹ to assess anxiety and stress levels among undergraduate

dental students. The study utilized a self-administered questionnaire to collect data on various aspects related to stress,¹² coping mechanisms,⁹ and the impact of stress on academic performance.

2.2. Participants

Undergraduate dental students from diverse dental colleges participated in the study, with 305 responses collected to ensure a robust dataset for analysis.

2.3. Questionnaire development

The questionnaire was crafted to comprehensively capture information on anxiety and stress without incorporating specific scales. It included sections on demographic details, academic-related stressors¹³, coping mechanisms,⁸ and perceptions regarding anxiety and stress in dental education. Participants responded to open-ended questions, providing qualitative insights.

2.4. Data collection

Data collection occurred through electronic distribution of the questionnaire to participants. Prior to participation, individuals were briefed on the study's purpose, and informed consent was obtained. Confidentiality of responses was ensured.

2.5. Measures

The questionnaire covered:

1. Demographic information (e g , age, gender, year of study).
2. Academic-related stressors (e g , workload, exams, clinical requirements).
3. Coping mechanisms employed by students to manage stress.
4. Perception of the impact of stress on academic performance.

2.6. Data analysis

Quantitative data underwent manual analysis via pie charts and bar graphs, summarizing demographics. Thematic analysis was employed for qualitative insights from open-ended responses, providing a holistic view of stressors and coping mechanisms among undergraduate dental students.

2.7. Ethical considerations

The study strictly adhered to ethical guidelines. Participants were guaranteed confidentiality and anonymity. Informed consent was secured, and participants were informed of their right to withdraw from the study at any point.

The material and methods thus employed in this study, devoid of specific scales, aimed to gain a comprehensive

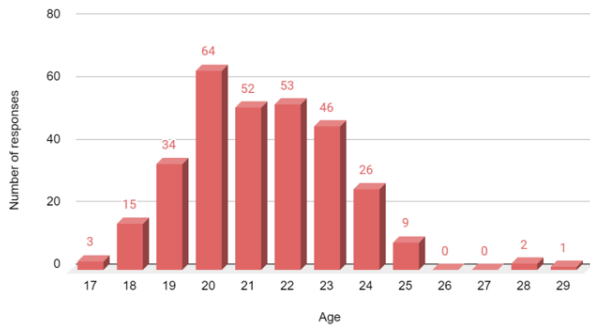


Figure 1: Age

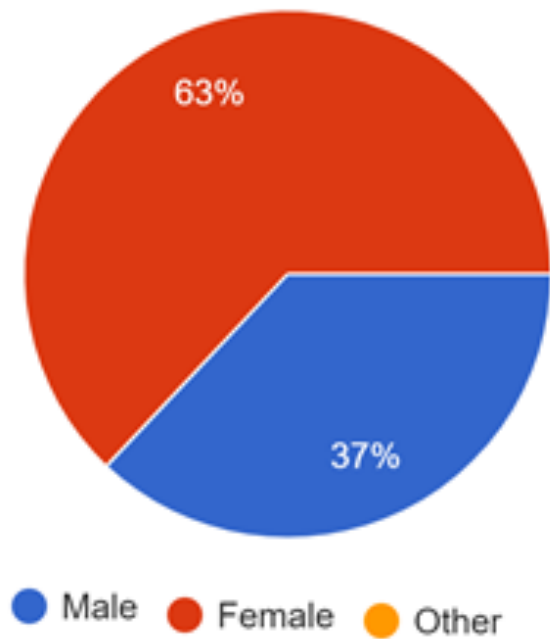


Figure 2: Gender

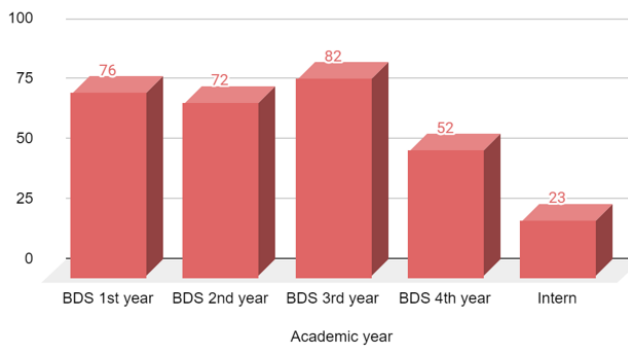


Figure 3: Academic year

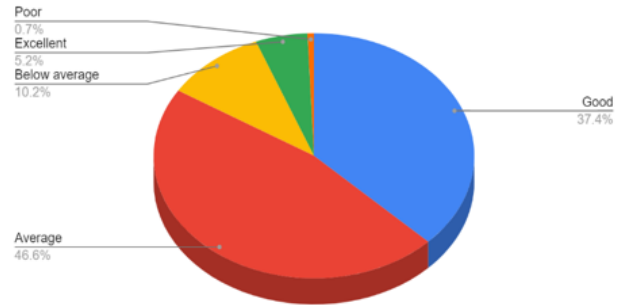


Figure 4: Rate your overall academic performance?

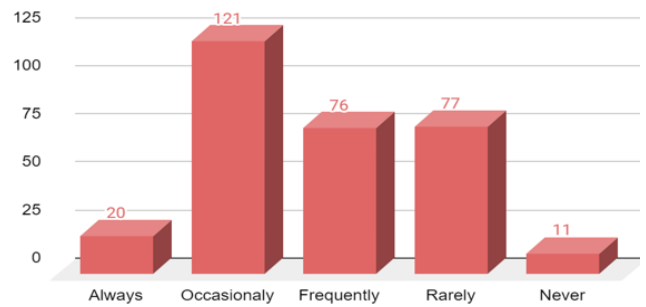


Figure 5: Anxiety related to the academic workload

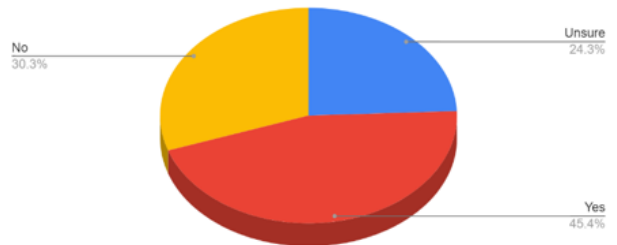


Figure 6: Comfortable seeking help or support for your anxiety related concerns within the dental school environment

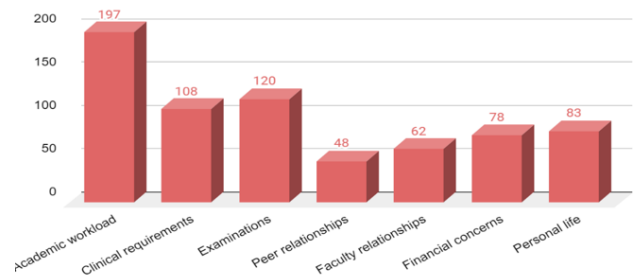


Figure 7: Main source of stress among undergraduate students

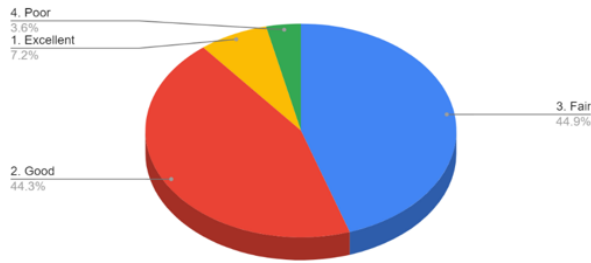


Figure 8: Overall well-being as a dental student

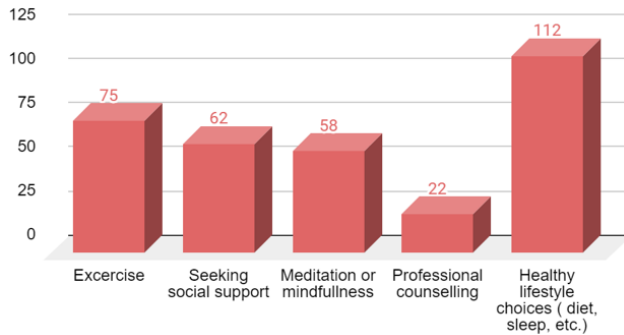


Figure 9: Coping strategies

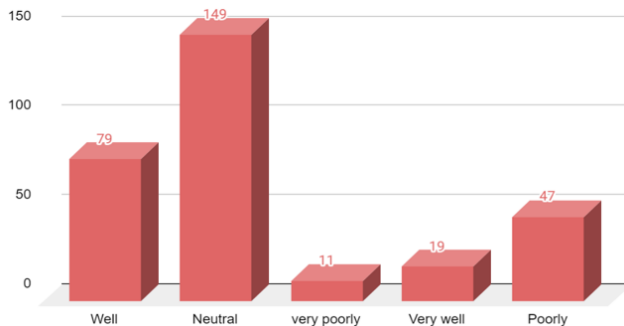


Figure 10: Management of time between personal life and academics

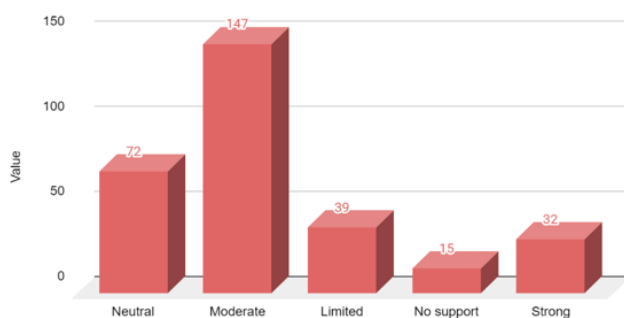


Figure 11: Level of support you receive from your classmates, friends and faculty members within the dental school community

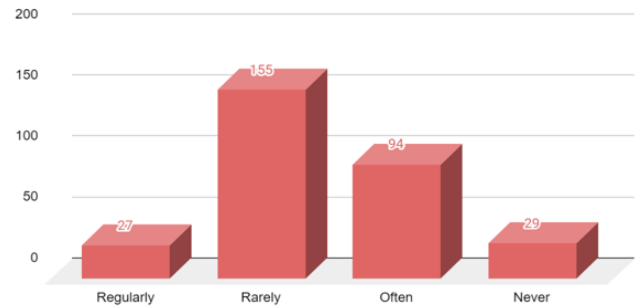


Figure 12: Any physical health symptoms (e.g. headaches, sleep disturbances, etc.) related to stress and anxiety

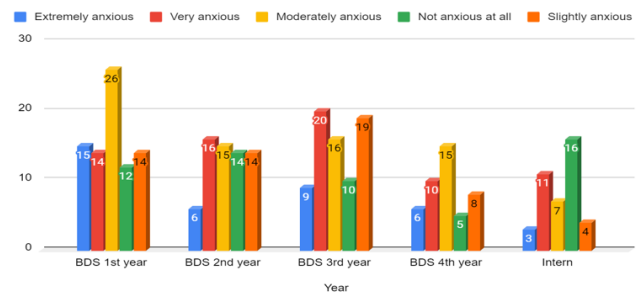


Figure 13: Anxiety related to future career in dentistry

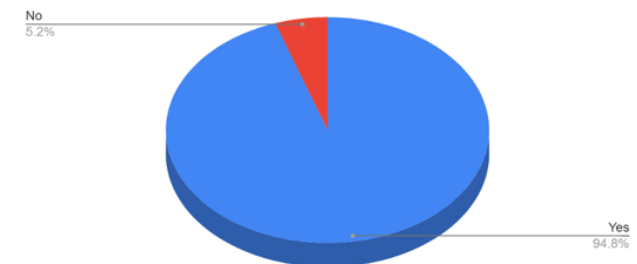


Figure 14: Mental awareness programmes will help dental students

understanding of anxiety and stress among undergraduate dental students. The use of a questionnaire with open-ended responses facilitated the collection of both qualitative and limited quantitative data, allowing for a nuanced analysis of stressors and coping mechanisms within the dental education context.

3. Result

Quantitative analysis revealed diverse stressors among undergraduate dental students, with examinations, academic workload, and faculty relations being primary contributors. Coping mechanisms varied, emphasizing the importance of time management, incorporating healthy life choices, exercise, and seeking social support from peers and faculty. Notably, students who reported higher engagement in

these adaptive coping strategies demonstrated a statistically significant correlation with lower perceived stress levels. The survey also indicated a positive association between participation in awareness programs and reduced anxiety, emphasizing the potential impact of such initiatives on alleviating stress among dental students. This finding underscores the relevance of holistic well-being strategies and targeted awareness efforts in dental education.

4. Discussion

The outcomes of this study contribute a comprehensive understanding of the stress landscape among undergraduate dental students. The identified stressors, encompassing examinations, academic workload, and faculty relations, echo the well-documented challenges intrinsic to dental education.⁷ The diverse coping mechanisms employed by students, such as effective time management, embracing healthy lifestyle choices, engaging in regular exercise, and seeking social support, underscore the adaptability and resilience within the student population.

Notably, the study highlights the potential impact of awareness programs on reducing anxiety among dental students. The positive association between participation in such programs and decreased anxiety levels¹³ signifies the value of targeted interventions aimed at augmenting student's awareness of stress management resources and support systems. Integrating these programs into the educational curriculum could not only foster a more supportive learning environment but also instill a proactive approach toward mental health.¹⁴ This study provides valuable insights into the intricate relationship between stress, coping mechanisms, and the potential benefits of awareness programs among undergraduate dental students. By identifying stressors and emphasizing coping strategies, the study lays a foundation for tailored interventions that prioritize the holistic well-being of dental students, fostering an environment conducive to academic success and overall quality of life.

To alleviate workplace stress among undergraduate dental students, several recommendations can be implemented. Introduce stress management workshops tailored to dental education demands, providing techniques such as mindfulness and time management skills. Enhance faculty support and communication channels for open dialogue and guidance, along with training on recognizing stress signs. Ensure access to mental health resources, including counseling services and support groups. Offer academic support services like tutoring and study skills workshops. Promote self-care practices such as exercise and hobbies. Provide clear guidelines and feedback mechanisms for coursework and clinical responsibilities, evaluating workload and scheduling. Continuously monitor and evaluate interventions, soliciting feedback for ongoing improvement in creating a supportive environment for

stress management among undergraduate dental students.¹⁵

It is crucial to acknowledge the study's limitations, including the reliance on self-reported data¹⁶ and the potential for selection bias. Future research endeavours could delve deeper into the effectiveness of specific intervention programs, considering long-term outcomes on the mental health and well-being¹⁴ of dental students.

The questionnaire was in the google form that constituted of 15 questions including demographic details, which were sent via online platforms. The google form included questions that enquired the stress, sources of stress, anxiety and coping mechanism.

Our study tried to limit the bias by including close ended questions which require self reporting. There was no intervention by the interviewer which could have caused misunderstanding in communication exchange between the researcher and respondent.

5. Conclusion

In culmination, this study delves into the complex realm of stress among undergraduate dental students, unravelling a tapestry of challenges including examinations, academic workload, and faculty relations.⁷ The diverse coping mechanisms employed by students, from effective time management to embracing healthy lifestyle choices, underscore the resilience within this student cohort.

Notably, the positive association between participation in awareness programs and reduced anxiety signifies the potential impact of targeted interventions on students' mental well-being. Integrating such initiatives into the curriculum emerges as a proactive strategy to cultivate a supportive learning environment.

Despite the study's limitations, including self-reported data¹⁶ reliance and potential selection bias, it lays a foundation for future research and interventions. As we navigate the evolving landscape of dental education, understanding stressors and promoting effective coping mechanisms remains imperative.

In essence, this study provides actionable insights for educators, administrators, and policymakers to develop holistic support systems that prioritize the mental well-being¹⁴ of undergraduate dental students.¹¹ By fostering an environment that acknowledges and addresses stressors⁹ while promoting adaptive coping strategies,⁸ we can contribute to a healthier, more resilient future for the next generation of dental professionals.

Coping mechanisms for stress and anxiety among undergraduate dental students involve effective time management, prioritizing tasks, and allocating time for study, clinical work, and relaxation. Mindfulness and relaxation techniques, such as meditation and deep breathing exercises, promote relaxation and reduce stress levels. Building social support networks with peers, faculty, and mentors provides emotional support and validation.

These supportive relationships align with Lazarus and Folkman's emphasis on seeking social support as a coping strategy. Encouraging healthy lifestyle choices, including a balanced diet, regular exercise, and sufficient sleep, enhances overall well-being and resilience to stress. Setting realistic expectations reduces perfectionism and feelings of inadequacy. Fostering positive thinking patterns and resilience-building techniques enables students to reframe negative thoughts and focus on strengths, enhancing their ability to cope with stress and adversity. Together, these coping mechanisms provide a comprehensive framework for managing stress among undergraduate dental students.¹⁷

6. Source of Funding

None.

7. Conflicts of Interest

There are no conflicts of interest.

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“Surveying Oral Health: A Comprehensive Analysis Of Disparity In Methods Of Tooth Brushing”

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Abstract

Aim: This study aimed to explore variations in tooth brushing techniques, frequency, additional mouth rinses, and the usage of toothpaste, daatun, electric toothbrushes, and charcoal among individuals aged 15 and above.

Objectives: The primary objective of this research was to identify and analyse patterns of oral hygiene practices across different age groups, investigating potential disparities in methods employed for maintaining oral health.

Materials & Methods: A comprehensive questionnaire consisting of 10 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 tooth brushing techniques, frequency, usage of additional oral care products, and preferred oral hygiene tools. Data collection was conducted through online responses.

Results: The survey results, obtained through Google Forms, revealed intriguing disparities in oral hygiene practices across age groups. Variations were observed in the choice of tooth brushing techniques, frequency of brushing, and the use of additional products such as mouth rinses, daatun, electric toothbrushes, and charcoal-based oral care items.

Conclusion: In conclusion, this study, utilizing Google Forms for data collection, highlighted diverse oral hygiene practices 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 to promote optimal oral health across the population.

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Keywords: *Tooth brushing techniques, frequency, additional mouth rinses, and the usage of toothpaste.*

INTRODUCTION

Dental health is fundamental to overall well-being, with oral hygiene practices serving as a cornerstone in the prevention of various oral diseases.¹ This expansive survey endeavours to unravel the intricate tapestry of oral care methodologies, specifically scrutinizing disparities in tooth brushing techniques, frequencies, and the incorporation of supplementary oral care products across diverse demographic groups.³

The landscape of toothbrushes encompasses traditional manual and electric variations, each catering to distinct preferences. Beyond these, alternative tools such as daatun, a traditional chewing stick, and activated charcoal

have gained prominence, prompting an exploration into the cultural and individual factors influencing the adoption of these diverse oral care instruments.^{2,3}

In parallel, the choice of toothpaste represents a significant dimension of oral care practices.⁴ Fluoride toothpaste, renowned for its cavity-preventing properties, stands alongside herbal and natural formulations, reflecting a nuanced spectrum of preferences influenced by cultural, ecological, and health-conscious considerations.⁵

The study delves into the intricacies of brushing techniques, encompassing widely recognized methods such as the Bass technique, modified Bass technique, and the Stillman technique.⁶ The frequency of brushing, an essential aspect of oral care, will be analysed alongside these techniques to unveil patterns and preferences that contribute to the broader landscape of oral health practices.

Moreover, the survey explores the adoption of supplementary oral care practices, including variations in mouth rinse types and frequencies of use. Understanding the incorporation of these additional elements into daily oral care routines will provide nuanced insights into oral health practices that extend beyond traditional brushing.^{7,8}

In conclusion, this research endeavours to comprehensively investigate oral hygiene practices, dissecting the choices in toothbrushes, toothpaste formulations, and specific brushing techniques.⁹ By delving into the intricacies of oral care habits, the study aims to unravel patterns that contribute to oral health disparities, paving the way for targeted interventions and tailored oral health promotion strategies across diverse communities.^{9,10}

MATERIAL AND METHOD

Study Design and Population:

This research employed a cross-sectional study design to investigate the disparities in oral hygiene practices among individuals aged 15 and above. The study population was randomly sampled from diverse backgrounds to ensure representation across different age groups.

Questionnaire:

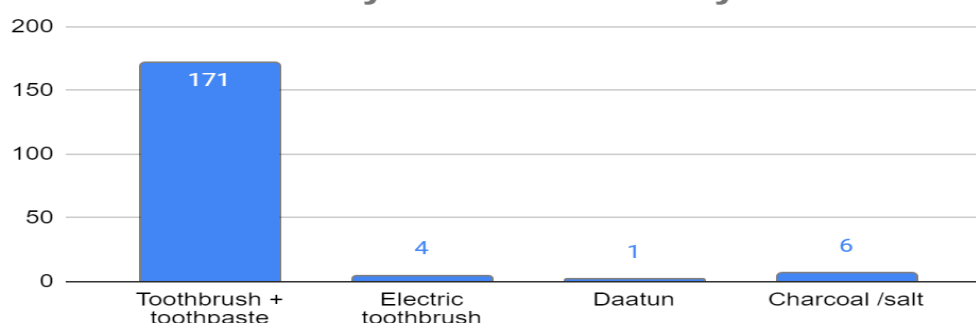
A comprehensive questionnaire comprising 10 questions was developed to collect data on various aspects of oral hygiene practices. The questionnaire was administered through Google Forms, facilitating efficient and standardized data collection. Questions covered topics such as tooth brushing techniques, frequency, use of additional oral care products (toothpaste, daatun, mouth rinses, etc.), and the preference for oral hygiene tools (electric toothbrushes, charcoal-based products, etc.).

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.

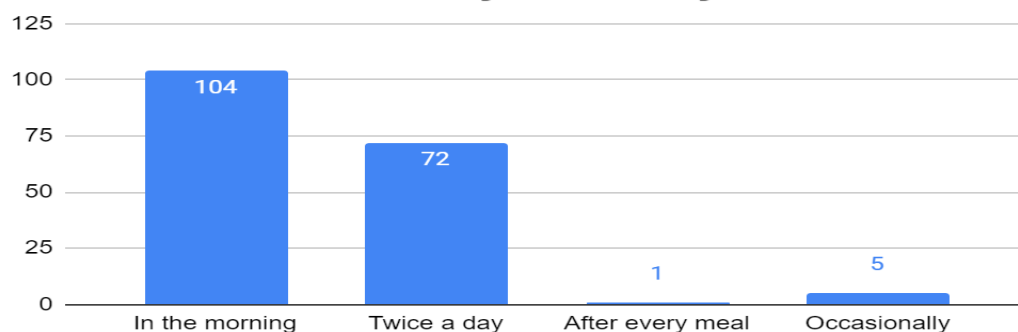
How do you like to brush your teeth?	Age Group				Grand Total	%
	14-21	22-35	36-50	Above 50		
Charcoal /salt		2	2	2	6	3%
Daatun		1			1	1%
Electric toothbrush		4			4	2%
Toothbrush + toothpaste	62	76	22	10	170	94%
Grand Total	62	83	24	12	181	100%

Count of How do you like to brush your teeth?



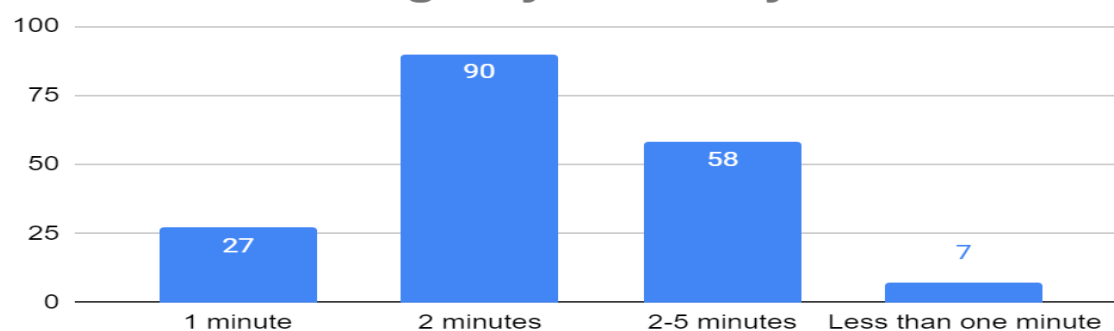
How often do you brush your teeth?	Age Group				Grand Total	%
	4	22-35	36-50	Above 50		
After every meal		1			1	1%
In the morning	36	48	13	7	104	57%
Occasionally		1	2	2	5	3%
Twice a day	26	33	9	3	71	39%
Grand Total	62	83	24	12	181	100%

Count of How often do you brush your teeth?

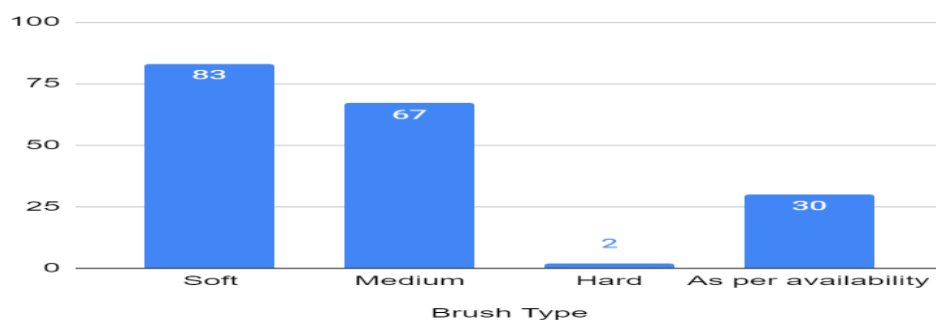


How long do you brush your teeth?	Age Group				Grand Total	%
	14-21	22-35	36-50	Above 50		
1 minute	11	8	7	1	27	15%
2 minutes	26	48	9	6	89	49%
2-5 minutes	24	24	6	4	58	32%
Less than one minute	1	3	2	1	7	4%
Grand Total	62	83	24	12	181	100%

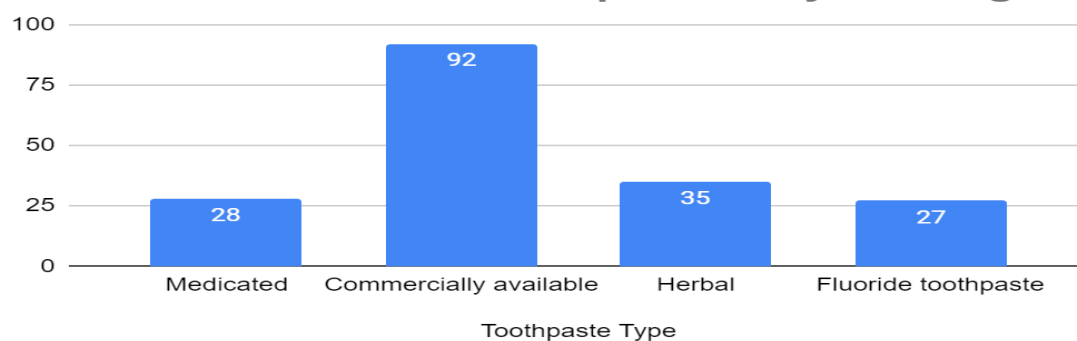
Count of How long do you brush your teeth?



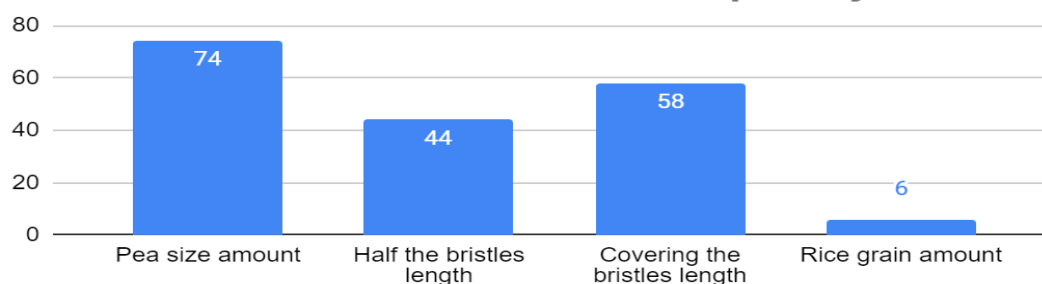
What type of brush do you use?	Age Group				Grand Total	%
	14-21	22-35	36-50	Above 50		
As per availability	9	14	4	3	30	17%
Hard	1			1	2	1%
Medium	26	28	9	3	66	36%
Soft	26	41	11	5	83	46%
Grand Total	62	83	24	12	181	100%

Count of What type of brush do you use?

What kind of toothpaste are you using?	Age Group				Grand Total	%
	14-21	22-35	36-50	Above 50		
Commercially available	39	43	4	5	91	50%
Fluoride toothpaste	11	13	2	1	27	15%
Herbal	9	13	10	3	35	19%
Medicated	3	14	8	3	28	15%
Grand Total	62	83	24	12	181	100%

Count of What kind of toothpaste are you using?

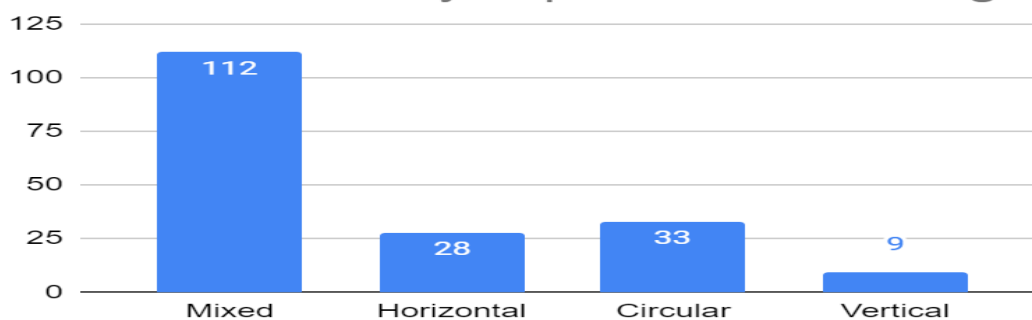
What is the amount of toothpaste you use?	Age Group				Grand Total	%
	14-21	22-35	36-50	Above 50		
Covering the bristles length	23	23	6	6	58	32%
Half the bristles length	12	22	6	4	44	24%
Pea size amount	24	37	11	1	73	40%
Rice grain amount	3	1	1	1	6	3%
Grand Total	62	83	24	12	181	100%

Count of What is the amount of toothpaste you use?

Count of What is the amount of toothpaste you use?

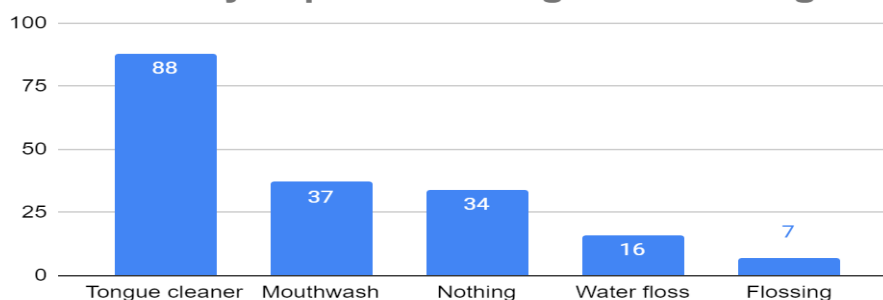
Which motion do you prefer for brushing?	Age Group				Grand Total	%
	14-21	22-35	36-50	Above 50		
Circular	15	9	7	1	32	18%
Horizontal	7	14	2	5	28	15%
Mixed	37	55	14	6	112	62%
Vertical	3	5	1		9	5%
Grand Total	62	83	24	12	181	100%

Which motion do you prefer for brushing?



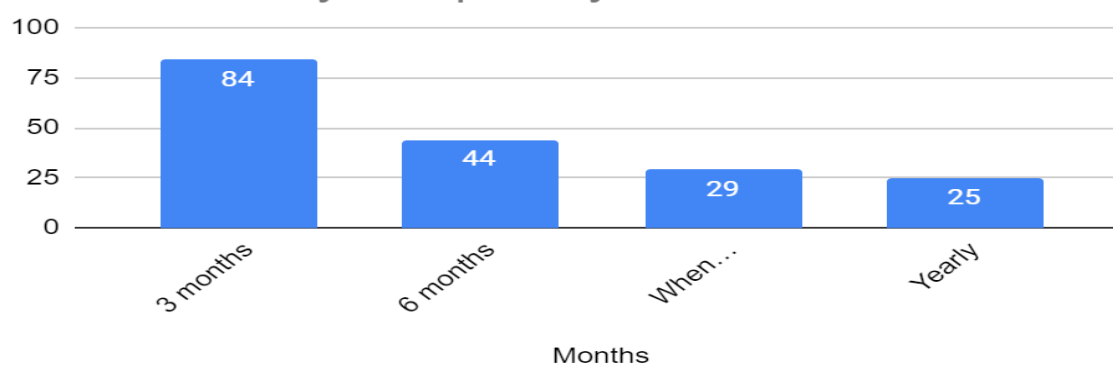
What all do you practice alongside brushing?	Age Group				Grand Total	%
	14-21	22-35	36-50	Above 50		
Flossing	2	4		1	7	4%
Mouthwash	13	17	4	2	36	20%
Nothing	11	12	5	6	34	19%
Tongue cleaner	31	45	10	2	88	49%
Water floss	5	5	5	1	16	9%
Grand Total	62	83	24	12	181	100%

What all do you practice alongside brushing?



How often do you replace your toothbrush?	Age Group				Grand Total	%
	14-21	22-35	36-50	Above 50		
3 months	26	40	10	7	83	46%
6 months	22	18	4		44	24%
When not left ideal for brushing (frayed toothbrush)	7	15	3	4	29	16%
Yearly	7	10	7	1	25	14%
Grand Total	62	83	24	12	181	100%

How often do you replace your toothbrush?



How often do you visit for dental check-up?	Age Group				Grand Total	%
	14-21	22-35	36-50	Above 50		
6 months	3	9	1	1	14	8%
Never	8	13		2	23	13%
Only when in discomfort	38	52	21	8	119	66%
Yearly	13	9	2	1	25	14%
Grand Total	62	83	24	12	181	100%

RESULTS

The study indicates a prevalent adherence to traditional oral care practices, with 94% favouring the Toothbrush + Toothpaste combination. Soft-bristle brushes (46%) and commercially available toothpaste (50%) are widely used. While most follow recommended brushing frequencies and durations, variations exist in additional practices and dental check-up frequencies.

DISCUSSION

The findings of this study illuminate significant disparities in oral hygiene practices among individuals aged 15 and above, providing valuable insights into diverse approaches to maintaining oral health¹. The use of a cross-sectional study design allowed for a snapshot of oral hygiene habits across different age groups, contributing to a comprehensive understanding of the variations observed.

The study revealed notable differences in tooth brushing techniques, frequency, and the utilization of additional oral care products. The choice of oral hygiene tools, including traditional methods such as daatun and modern alternatives like electric toothbrushes, showcased a wide spectrum of preferences among participants. Such diversity underscores the importance of recognizing individual preferences and habits when designing oral health interventions.²

The prevalence of specific practices, such as the use of charcoal-based oral care products, indicates a growing trend that merits attention in public health initiatives³. Charcoal, known for its adsorption properties, has gained popularity in oral care products; however, further research is warranted to evaluate its efficacy and potential side effects.

The utilization of Google Forms for data collection proved to be a practical and efficient approach, allowing for widespread dissemination of the questionnaire and facilitating a diverse participant pool. The online platform also minimized potential biases associated with face-to-face interviews. However, it is essential to acknowledge potential limitations, such as the reliance on self-reported data, which may introduce recall bias. Additionally, the study's cross-sectional nature limits the establishment of causal relationships, emphasizing the need for future longitudinal investigations.

The subgroup analyses conducted across different age groups revealed intriguing patterns in oral hygiene practices. Tailoring oral health education programs to specific age cohorts may enhance the effectiveness of

interventions. For instance, younger age groups may benefit from targeted initiatives promoting the use of modern tools like electric toothbrushes, while traditional methods may resonate more with older individuals.^{4,5}

The study's results carry implications for public health strategies aimed at promoting optimal oral health. Personalized approaches that consider individual preferences and habits are crucial in designing interventions that resonate with diverse populations.⁶ Future research could delve deeper into the factors influencing these oral hygiene practices, considering socio-economic, cultural, and educational influences to develop more nuanced interventions.⁷

In conclusion, this study sheds light on the dynamic landscape of oral hygiene practices, emphasizing the need for tailored interventions to address the diverse preferences observed among individuals aged 15 and above.^{8,9} The insights gained contribute to the ongoing discourse on effective oral health promotion, advocating for strategies that resonate with the unique needs of different demographic groups.¹⁰ It seems that among the population, dental anxiety may not influence regular dental visits because the expectation is that dentists are to be visited only when there is an urgent oral health problem.¹³

CONCLUSION

The study reveals a significant prevalence of conventional oral hygiene practices, with the majority favoring the use of toothbrushes alongside toothpaste. Traditional toothpaste formulations and soft-bristle brushes are commonly preferred. The study highlights diverse practices in terms of brushing duration, frequency, and additional oral care habits. While the majority follows recommended oral care practices, there are variations across age groups, emphasizing the need for targeted oral health education.^{7,8} Addressing the observed disparities can contribute to the development of tailored oral health interventions, fostering improved oral health outcomes within diverse communities.¹¹ The findings underscore the importance of considering individual preferences and habits in formulating comprehensive oral health strategies. Furthermore, claimed toothbrushing frequency and rinsing method used after brushing should be given due consideration as important factors in the design and analysis of caries clinical trials.¹⁴ Also, plaque still remains after brushing with toothbrush, which indicates that toothbrushing always must be supplemented with interdental aids and that the shape of brushes as well as the techniques used are of little importance.¹⁵

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TITLE

To Evaluate and Compare the Anti-Microbial and Anti-Fungal Properties of
Cassia fistula Extracts at different percentages Incorporated into Acrylic Resin.