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Assessment of Coffee Consumption on Oral Health Status Among Patients Visiting Dental Clinics in 82 Division Enugu

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Abstract: Drinking coffee is known to have both positive and negative aftermath on periodontal health. This study was conducted at 82 Division Dental Clinic in Enugu. The study explored the relationship between coffee consumption and oral health among 100 patients. The researcher used all the population for the study and thus, no sampling technique was employed. Three research questions and specific objectives guided the study. Three research hypotheses guided the study. A cross sectional study was conducted among patients visiting dental Clinics in 82 divisions, Enugu. A structured questionnaire was used to collect data on coffee consumption habits, oral hygiene practices and dental health status. The result was analyzed using simple frequency table. The majority (64%) were male, while 36% were female. Results showed that 42% of patients consumed coffee daily; while 20% did so occasionally. Most patients (71%) believed coffee causes bad breath, and 40% associated it with tooth staining. The study revealed a knowledge gap regarding excessive coffee intake's effects on oral health. Researchers recommended moderate coffee consumption, regular dental check-ups, and good oral hygiene practices to mitigate negative effects. They also emphasized the need for intensified dental education and oral health promotion.

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I. INTRODUCTION

Coffee consumption has been associated with various oral health issues, including tooth decay, staining, and enamel erosion (Andriany et al., 2012; Pratomo et al., 2018). Coffee is a popular beverage made from the roasted seeds of the coffee plant, containing bioactive compounds such as caffeine, polyphenols, and antioxidants, which may contribute to its potential health benefits (International Coffee Organization (Nd)). The frequency and amount of coffee consumption can play a role, with drinking two or more cups per day potentially increasing the risk of periodontitis. Coffee's chemical makeup Coffee is one of the most widely consumed beverages globally, comprising a complex mixture of thousands of chemicals. Its bioactive compounds include: Phenolic compounds (e.g., chlorogenic acid), Methylxanthines (e.g., caffeine, theophylline, and theobromine), Diterpenes (e.g., cafestol and kahweol and Vitamins and minerals (e.g., vitamin B3, magnesium, and potassium).

Coffee consumption has been linked to various health benefits, including: Lower risk of diabetes and Protective effects against cardiovascular diseases, Alzheimer's disease, and gastritis

However, some individuals may experience negative effects, such as:Anxiety and Insomnia. While moderate coffee consumption may have therapeutic effects, excessive intake can lead to adverse effects. Finding an adequate dose is crucial to maximizing benefits while minimizing risks. contributes to its negative effects on oral health, - Tannins

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and chlorogenic acid can cause tooth discoloration, Acidity (pH 4.9-5.2) can lower salivary pH, increasing susceptibility to decay, Carbohydrates, sucrose, and monoxide can contribute to tooth decay

Oral bacteria, such as Streptococcus mutans, ferment carbohydrates in coffee, producing acids that lower salivary pH (Andriany et al., 2012; Kelvin, 2025). This acid production can lead to tooth decay. Coffee consumption can alter salivary pH, potentially leading to acid criteria (Dea Permata, 2024). Changes in salivary pH are crucial for dental health, as they can contribute to the development of bacterial plaque and caries. Adding sugar, cream, or other sweeteners to coffee can increase the risk of tooth decay and enamel erosion, as these substances are fermented by oral bacteria (Dea Permata, 2024).

Excessive caffeine consumption has been linked to negative effects on dental health, including periodontitis progression, bone loss, and tooth loss (Han et al., 2016; Song et al., 2018).Coffee consumption, particularly when excessive or with added sweeteners, can have significant implications for oral health. Understanding the chemical composition of coffee and its effects on oral bacteria and salivary pH can help individuals make informed choices about their coffee consumption.

While coffee consumption has been linked to various oral health issues, On the other hand, moderate coffee consumption may have protective effects against dental caries due to its antibacterial properties and the presence of certain compounds that can inhibit plaque formation (Song et al., 2018). Research suggests that coffee contains enzymes that can help protect against decay-causing bacteria, potentially reducing the risk of oral health issues (Kelvin, 2025). These enzymes have been found to: reduce the growth of harmful bacteria in the mouth, slow down the formation of biofilm, plaque, and tartar. However, adding flavorings, sugar, or milk to coffee may undermine these benefits. The enzymes present in coffee could be a powerful preventative measure against oral health issues, particularly if consumed in its pure form (Kelvin, 2025). This finding highlights the importance of considering the ingredients and additives used in coffee, as they may impact its potential oral health benefits

II. STATEMENT OF THE PROBLEM

Despite the potential health benefits associated with moderate coffee consumption, such as reduced risk of diabetes and cardiovascular diseases, excessive coffee intake has been linked to negative effects like anxiety, insomnia, and oral health issues, including tooth decay, staining, and enamel erosion. The relationship between coffee consumption and oral health outcomes is complex, and there is a need to investigate the effects of coffee's chemical composition, including its acidity and carbohydrate content, on salivary pH and the development of dental caries and periodontal diseases.

- *Specific Purpose of the study*

- To determine Coffee consumption habits between male and female patients attending 82 division dental clinic Enugu
- To know the relationship between coffee intake and oral health outcomes among the patients attending 82 divisions Dental Clinic, Enugu
- To know the risk factors and protective factors influencing oral health among coffee consuming patients attending 82 divisions Dental Clinic, Enugu

- *Research Questions*

- What are coffee consumption habits between male and female patients attending 82 division dental clinic Enugu?
- Is there relationship between coffee intake and oral health outcomes among the patients attending 82 divisions Dental Clinic, Enugu?
- Are there risk factors and protective factors influencing oral health among coffee consuming patients attending 82 divisions Dental Clinic, Enugu?

- *Research Hypotheses*

- H0: There is no significance difference in coffee consumption habits between male and female patients attending 82 division Dental Clinic Enugu
- H1: There is significance difference in coffee consumption habits between male and female patients attending 82 Division Dental Clinic Enugu
- H0: There is no significance relationship between coffee intake and oral health among patients visiting 82 Division Dental Clinic
- H1: There is significance relationship between coffee intake and oral health among patients visiting 82 Division Dental Clinic
- H0: There is no significance risk factors and protective factors influencing oral health among coffee consuming patients visiting 82 Division Dental Clinic.

III. RESEARCH METHODS

A cross sectional study was conducted among patients visiting dental Clinics in 82 division, Enugu. A structured questionnaire was used to collect data on coffee consumption habits, oral hygiene practices and dental health status. A cross- sectional study is a type of research design that involves collecting data from a population at a single point in time (Creswell, 2014). This study the assesses the coffee intake on oral health among 100 patients attending 82 division dental clinic Enugu. Participant include active personnel aged 18-60years, with no dental or medical conditions affecting oral health. The population of this study focuses on individuals accessing healthcare services at 82 Division Hospital. Understanding the demographics, health needs, and experiences of this diverse population is crucial for evaluating the effectiveness of the hospital's services.

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➢ *Sample size and Sampling Technique*

Since the population was small, the researcher used all the population for the study and thus, there was no sampling technique employed.

IV. RESULT ANALYSIS

➢ *Demography Information*

Table 1 Age range

Age	Frequency	Percentage
Below 18	0	0
18-25	32	32
26-35	30	30
36-45	20	20
46-55	10	10
56 and above	8	8
Total	100	100

Table 1 above shows the age range of 100 participants who completed the questionnaire. Out of the 100 32(32%) were at the range of 18-25years, 30(30%) were at the range of 26-35years, 20(20%) were at the range of 36-45years, 10(10%) at the range of 46-55years, 8(8%) at the range of 56 and above

Table 2 Gender

Gender	Frequency	Percentage
Male	64	64
Female	36	36
Total	100	100

Table 2 above shows gender that out of the 100 patients 64(64%) were male while 36(36%) were female while 0(0%) other/ preferred not to say

Table 3 Occupation

Occupation	Frequency	Percentage
Student	10	10
Professional	40	40
Business person	31	31
Retired	19	19
Total	100	100

Table 3 above shows the occupation of the patients among the 100 patients, 40(40%) of the patients are professionals, 31(31%) were business person, 10(10%) were students, 19(19%) were retired.

Table 4 Level of Education

Level of education	Frequency	Percentage
Primary	0	0
Secondary	6	6
Under graduates	54	54
Postgraduate	40	40
Total	100	100

Table 4 shows the level of education of the patients 54(54%) were undergraduates, 40(40%) were postgraduates, 6(6%) were secondary, 0(0%) were primary**.**

Table 5 Coffee Consumption Habits and General knowledge of coffee and Oral Health

How often do you consume coffee Male Female Frequency Percentage				
Daily	28	17	42	42
Several times a week	20	13	33	33
Occasionally	12	8	20	20
Never consumed	4	1	5	5
Main component of coffee that could affect oral health				

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Caffeine	50	50
Acidity	10	10
Tannins	12	12
Sugar	28	28
Impact excessive coffee consumption has on teeth and gums		
Causes tooth decay.	21	21
Leads to gum diseases	7	7
Stains teeth	40	40
Causes dry mouth	11	11
No significant impact	0	0
Don't know	21	21
Does coffee cause bad breath		
Yes	70	70
No	30	30

Table 5 illustrates the general knowledge of coffee among the 100 patients who replied to the questionnaire; 42(42%) indicate that they consume coffee every day, 33(33%) consume coffee several times a week, 20(20%) consume coffee sometimes, and 5(5%) have never had coffee. 50(50%), or half of the patients, believe that caffeine is the key component that could damage dental health, whereas 28(28%) believe sugar can affect oral health. 12 (12%) feel tannins have an impact on oral health. 10(10%), which is the lowest percentage, believes acidity affects oral health. 40(40%) reported that excessive coffee stains the teeth, 21(21%) reported tooth decay, 11(11%) claimed dry mouth, 7(7%) reported gum disease, and 21(21%) reported they are unaware of the damage. 71 (71%) agreed that coffee creates bad breath, whereas 29 (29%) said no.

Table 6 Relationship between coffee intake and oral health outcomes among the patients

Oral health issues associated with coffee drinking	**Frequency**	**Percentage**
Enamel erosion	20	20
Tooth discoloration	20	20
Gum recession	7	7
Bad breath	40	40
Dry mouth	13	13
Does acidity of coffee potentially affect oral health	Frequency	Percentage
Weaken enamel making teeth to decay vulnerably	50	50
Inflammation of the gum	33	33
No impact on oral health	14	14
Don't know	3	3
Does caffeine affect saliva production and oral health	Frequency	Percentage
It can reduce saliva flow, lead to dry mouth	70	70
It stimulate saliva production	2	2
No impact on saliva	8	8
Don't know	12	12
Coffee consumption can lead to tooth staining	Frequency	Percentage
Yes	61	61
No	39	39
Excessive coffee intake contribute to cavities	Frequency	Percentage
Yes	45	45
No	55	55

Table 6 illustrates the association between coffee consumption and dental health results.40 (40%) said foul breath is an oral health condition most commonly related with drinking coffee. 20 percent reported enamel degradation, 20 percent reported tooth discoloration, 13 percent reported dry mouth, and 7 percent reported gum recession. 35 (35%) claimed the acidity of coffee weakens the enamel, 40 (40%) said it causes gum inflammation, and 14 (14%) said it has no effect on oral health. 11 (11%) stated they didn't know. 70(70%) claimed caffeine affects saliva production and oral health by reducing saliva flow, resulting in dry mouth; 12(12%) said they don't know; 8(8%) said no influence; and 2(2%) said it increases saliva. Sixty-one percent (61%) agreed that drinking coffee can cause teeth stains, while 39 percent disagreed. 55(55%) do not agree. 55(55%) do not accept that excessive coffee intake contribute to the development of cavities.

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Table 7 Practices and Habits related to coffee and oral health

Practices and habits related to coffee and oral health	Frequency	Percentage
Brush teeth after drinking coffee	33	33
Drink water after consuming coffee	43	43
Use a straw to minimize coffee contact with teeth	2	2
I don't take any precaution	22	22
Drinking coffee in moderation has a lesser impact on oral health than excessive consumption		
Yes	68	68
No	32	32
Consumption is linked to any other oral health problem		
Yes	45	45
No	55	55
Have you ever been advised by a dentist		
Yes	70	70
No	30	30

Table 7 displays the practices and habits associated with coffee and dental health. After drinking coffee, 33 (33%) clean their teeth and 43 (43%) drink water. Two percent use straws to reduce coffee consumption, while 22 percent do not. 68 (68%) respondents said they consume coffee in moderation. 32 (32%) people replied no. 45 (45%) agreed that coffee use is associated to any other oral health condition, whilst 55 (55%) said no. 70% indicated they were advised by a dentist, whereas 30% replied no.

Table 8 Source of Knowledge

Your information about coffee and its effects on oral health are gotten from	Frequency	Percentage
Dentist or dental hygienist	31	31
Medical professionals	0	0
Online resources	23	23
Family or friends	46	46
Books, articles or journals	0	0
feel well informed about how coffee affects oral health		
Yes	57	57
No	43	43

Table 8 displays the range of knowledge sources among the 100 patients who completed the questionnaire. 46 (46%) stated they learnt about coffee and its impact on dental health via family or friends, 31 (31%) from a dentist or hygienist, 23 (23%) from online sites, and 0 (0%) from medical experts. 57 (57%) people agreed that drinking coffee has an impact on their oral health, whereas 43 (43%) disagreed.

V. RESULT OF TEST OF HYPOTHESIS

H0: There is no significance difference in coffee consumption habits between male and female patients attending 82 division Dental Clinic Enugu

Level of significance($\propto$)= 0,05

Sample size(n)= 100

Chi-square statistic:

Table 9 Result of test of hypothesis

GENDER	Observed frequency	Expected frequency
Male	64	50
Female	36	50

Chi-square statistics

$X^2 = \sum[(0-E)^2/E] = 3.92+3.92 = 7.84$

Degree of freedom

Df =(number of cayegories-1)=2-1=1

critical Value using a chi-square distribution table, the critical value for df=1 and a=0.05 is approximately 3.84

➢ *Conclusion*

Since the cal X^2 (7.84) is greater than the critical value (3.84), reject null hypothesis (HO). This shows that there is a significant difference in coffee consumption habits between male and female patients attending 82 division Dental Clinic Enugu.

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➢ *Hypothesis 2*

H0: There is no significance relationship between coffee intake and oral health among patients visiting 82 Division Dental Clinic

➢ *Chi-square calculation*

$X^2 = 4.763$

Degree of freedom

$Df_{=(\text{number of cayegories-1})=2-1=1}$

critical Value using a chi-square distribution table, the critical value for df=1 and a=0.05 is approximately 3.84

➢ *Conclusion*

since the cal X^2 (4.763) is greater than the critical value (3.84), reject null hypothesis (HO). This suggests that there is significance relationship between coffee intake and oral health among patients visiting 82 Division Dental Clinic

VI. DISCUSSION

The purpose of this study was to provide insight into the effects of coffee on oral health by reporting on patients' understanding of excessive coffee intake on oral health at the 82 Division Dental Clinic in Enugu. Out of the 100 patients, 32 (32%) were between the ages of 18 and 25, 30 (30%) were between the ages of 26 and 35, 20 (20%) were between the ages of 36 and 45, 10 (10%) were between the ages of 46 and 55, and 8 (8%) were between the ages of 56 and older. Out of 100 patients, 64 (64%) were male, 36 (36%) were female, and 0 (0%) were other/preferred to say, indicating that excessive coffee drinking is more prevalent in men.

Table 3 above shows the occupation of the patients among the 100 patients: 51(51%), or half of the patients, were professionals, 22(22%) were business people, 20(20%) were students, and 7(7%) were retired. This shows that patients attending dental clinics are more professionals, and they consume a lot of coffee, which helps them stay alert. The patients' levels of education ranged from tertiary (54%) to undergraduate (40%), secondary (6%), and primary (0%).

The general knowledge of coffee among the 100 patients who responded to the questionnaire was that 33(33%) consume coffee occasionally, 20(20%) consume coffee twice a week, 42(42%) consume coffee daily, and 5(5%) never consume coffee. In this study, the consumption of coffee among patients is higher in percentage among those who consume it daily. 50 (50%), or half of the patients, believe that caffeine is the key component that may impair dental health. 28 (28%) feel sugar can impact oral health. 12 (12%) feel that tannins can influence oral health. 10(10%), the lowest percentage, believes acidity affects oral health; this demonstrates that understanding the caffeine content of coffee can have an impact on oral health. 49 (49%) indicated that drinking too much coffee stains their teeth, 31 (31%) reported tooth decay, 11 (11%) claimed dry mouth, 7 (7%) reported gum disease, and 2 (2%) said they were unaware of the consequences. 71 (71%) agreed that coffee creates bad breath, whereas 29 (29%) said no. According to this study, teeth stains are one of the side effects of excessive coffee consumption.

In terms of particular oral health issues associated with coffee use, 40 (40%) stated that foul breath is the most common oral health issue associated with drinking coffee. Twenty (20%) reported enamel degradation, twenty (20%) reported tooth discolouration, thirteen (13%) reported dry mouth, and seven (7%) reported gum recession. 35 (35%) claimed the acidity of coffee weakens the enamel, 40 (40%) said it causes gum inflammation, and 14 (14%) said it has no effect on oral health. 11(11%) stated they didn't know. Research demonstrates that patients with foul breath (halitosis) and acidity content of coffee have a greater percentage. Acidity of coffee destroys enamel due to the high PH value in acidic content. 70(70%) said caffeine affects saliva production and oral health by reducing saliva flow, resulting in dry mouth, 12(12%) said they don't know, 8(8%) said no impact, and 2(2%) said it stimulates saliva production, implying that the caffeine content of coffee affects patients with a higher percentage. 61 (61%) agreed that coffee consumption can cause teeth staining. 39 percent do not agree. 55 (55%) do not believe that excessive coffee consumption contributes to the development of cavities. Table 7 reveals that 43(43%) drink water after drinking coffee, 33(33%) wash their teeth after drinking coffee, 22(22%) take no precautions, and 2(2%) use a straw to reduce coffee consumption. 68 (68%) respondents agreed that drinking coffee in moderation has a lower impact on dental health than excessive coffee use, while 32 (32%) disagreed. 70 (70%) indicated they had not received advice from a dentist, whereas 30 (30%) said yes. Table 8 displays the range of awareness and education among the 100 patients who completed the questionnaire. 46 (46%) stated they learnt about coffee and its impact on dental health via family or friends, 31 (31%) from a dentist or hygienist, 23 (23%) from online sites, and 0 (0%) from medical experts. 57 (57%) agreed that coffee drinking is associated with any additional oral health concerns, whilst 43 (43%) disagreed.

VII. CONCLUSION

The inquiry investigating the impact of coffee drinking on dental health among patients at Enugu's 82 Division Dental Clinic yielded important findings. The findings suggest that, while coffee may have some benefits due to its antioxidant characteristics, excessive or regular intake can be harmful to dental health. Coffee's acidity, potential for tooth staining, and contribution to dental decay, especially with additional sugars or flavorings, were identified as serious problems. Many individuals showed evidence of tooth discoloration, enamel erosion, and an increased risk of cavities, all of which are usually associated with frequent coffee consumption. Furthermore, a lack of sufficient oral care after drinking coffee was discovered as a significant cause to these oral health problems.

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RECOMMENDATION

- *At the end of the Study, the following Recommendations were made*

Raising patient awareness of the oral health hazards associated with coffee consumption. Dental professionals at 82 Division Dental Clinic should address these dangers with their patients, especially those who drink coffee on a regular basis. Providing educational tools and holding workshops can assist patients learn about proper mouth care after drinking coffee.

Encourage patients to practice good oral hygiene habits, such as cleaning their teeth twice a day and using mouthwash to neutralize the acidity of coffee. They should also be encouraged to drink water after drinking coffee to avoid stains and enamel damage.

Encourage regular dental visits. Regular dental check-ups are strongly advised to monitor any coffee-related damage to oral health. Dental practitioners should be proactive in detecting early indicators of damage caused by coffee drinking and providing preventive treatments, such as fluoride applications to protect enamel, scaling and polishing for tooth stains, gingivitis, etc.

Advocate for Moderation and Alternatives: Patients should be encouraged to limit their coffee intake, especially when combined with sugar and cream. Suggesting alternatives like herbal teas or water can help reduce negative effects on oral health. Additionally, recommending less acidic coffee options can help minimize the risks.

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