

# Prevalence And Association Of Dentinal Hypersensitivity And Dietary Habits Among Alkharj Population

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**ABSTRACT:** *Aim: The aim of this study was to assess prevalence of dentinal hypersensitivity and its association with diet and dietary habits among adults aged 18–30 years. Methods: A total of 389 subjects aged 18-30 years who reported to our institution with dentin sensitivity were considered. The questionnaire was given to subjects and were requested to complete the questionnaire and revert. Information about demographic data such as age, sex followed by details of their diet types; dietary habits and other associated habits were recorded. Results: Prevalence of dentinal hypersensitivity was found to be 44%. The subjects having dentinal hypersensitivity consumed more fizzy drinks with meals (OR=4.30), Aerated drinks (OR=3.04), consumption of fizzy drinks (OR=1.75) consumption of green leafy vegetable and junk foods along with sweet candies was not statistically associated with dentinal hypersensitivity ( $p<0.05$ ). Twice brushing and use of fluoridated tooth paste did not yield a significant odds ratio. Conclusion: Consumption of fizzy rinks, aerated drinks has higher chances of developing dentinal hypersensitivity.*

**Keywords:** *dentinal hypersensitivity, dietary habits, fluoridated tooth paste.*

## 1. INTRODUCTION

Dentine hypersensitivity (DHS) is one of the most frequently encountered dental problems. It is characterized by short sharp pain arising from exposed dentine in response to stimuli like thermal, evaporative, tactile, osmotic or chemical and which cannot be attributed to the other dental flaws or pathology.<sup>1</sup> Hypersensitivity is also seen on several teeth in one area of the mouth or on one specific tooth.<sup>2,3</sup> DHS should be distinguished from other causes of tooth sensitivity which is due to other clinical conditions like cavity, micro leakage, cracked tooth or fractured restorations.<sup>4</sup> The clinical management of DHS will be a task for clinician with different treatment modalities, but the success of any sound treatment plan is relied on taking an intensive clinical and dietary history. Differentially diagnose the condition from other dental pain conditions to recognize etiological and predisposing factors.<sup>5-8</sup> when the enamel or cementum is detached, the underlying dentin tubules are exposed together producing dentin hypersensitivity. It has been hypothesized that DHS develops in two phases namely lesion localization and lesion initiation.<sup>9</sup> Lesion localization occurs by loss of protective

covering over the dentin thus revealing it to external environment. Lesion initiation occurs after the protective covering of smear layer is removed, resulting in exposure and opening of dentine tubules. Evidence by now showed that the lesions of DHS have more and wider open tubules than do non sensitive dentin.<sup>10,11</sup> Dentin exposure will be caused by physical, chemical, pathological, biological challenges or developmental abnormalities that lead to dental or periodontal damage or defects. Various clinical conditions may play a task within the development of DHS include enamel attrition,<sup>12</sup> erosion, corrosion,<sup>13</sup> abrasion and abfraction.<sup>14</sup> Periodontal tissue loss or gingival recession is another major influencing factor resulting in exposure of cervical and root dentin.<sup>15,16</sup> Other factors are like aging, soft tissue dehiscence, including abnormal brushing habit may cause apical displacement of the gingival margins thereby resulting in exposure of dentin that may ultimately cause DHS.<sup>17</sup> Ingestion of carbonated drinks has become very trendy among young adolescents. The carbonated beverages mostly have low pH and when they come in contact with the hard tissues may abolish the hydroxyapatite crystals by erosion.<sup>18</sup> Most common surfaces involved are occlusal surfaces of posterior teeth, facial and palatal surfaces of anterior teeth.<sup>19</sup> Dental erosion among people is increasing although its significance to oral health is not important as caries and periodontitis.<sup>20</sup> According to previous reports the prevalence of dentinal hypersensitivity varies from 45 – 57% till now there are very few published reports about prevalence of dentinal hypersensitivity and associated with dietary factors among population of Saudi Arabia, hence the present study was conducted to know the prevalence of dentinal hypersensitivity and its association with dietary habits.

## **2. AIMS & OBJECTIVES:**

### **AIM:**

The aim of this study was to assess prevalence of dentinal hypersensitivity and its association with dietary habits among adults aged 18–30 years.

### **OBJECTIVES OF STUDY:**

- To assess prevalence of dentinal hypersensitivity among adults aged 18-30 years.
- To compare dentinal hypersensitivity & dietary habits among adults aged 18–30 years.

## **3. MATERIALS AND METHODS**

A cross sectional study was conducted to assess the prevalence and association of dentinal hypersensitivity with dietary habits among 18-30 year old subjects attending for dental treatment at College of Dentistry, Prince Sattam bin Abdulaziz University, Alkharj.

### **Sample Size Estimation:**

Samples size was estimated using the formula : $n = \frac{z^2pq}{d^2}$

Based on reports of previous studies where prevalence of hypersensitivity was found to be at 50% the sample size was estimated at 5% precision level. After substituting the values the required minimum required sample size was 384.16.

### **Inclusion Criteria:**

- Adult subjects aged 18-30 years old.

**Exclusion Criteria:**

- Subjects who are not willing to participate.
- Subjects who have known history of chronic gastric regurgitation or similar conditions.
- Subjects who are undergoing orthodontic treatment.
- Recent history of dental scaling

**4. METHODOLOGY:**

Data was collected from 400 subjects, irrespective of gender of 18-30 years of age. A self-designed close ended structured questionnaire was used to gather information over study variables which were pretested first. Validation of questionnaire: the validity of the questionnaire was measured on 30 subjects who were excluded from the main analysis. Resulted kappa value was 0.87. The questionnaire was translated to Arabic and used. The translation was done according to the WHO process of translation and adaptation of instrument. The reliability of the questionnaire was measured using test – retest method. The questionnaire was based on 8 questions which were regarding individual's intake and effects of dietary habits on teeth (Table 3). Data was evaluated through SPSS software version 23. Percentages and frequencies were utilized for qualitative variables. Descriptive statistics for demographic data was tabulated. The percentage exposure to diet and dietary habits were calculated among those with dentinal hypersensitivity and those without dentinal hypersensitivity and Odds ratio values were calculated for each of the habits. Level of significance was set at  $p < 0.05$ . A total of 500 surveys were sent electronically; of these, 422 reply were received giving a response rate 84.4% of out of these 33 were having incomplete response hence were not included for the analysis. So finally a total of 389 questionnaires were considered for final analysis. Out of 389 subjects (287 were males and 102 were females the age range was between 18 – 30 years with a mean age of  $25.34 \pm 2.79$  (table 1). Total number of participants having hypersensitivity was found to be 171 (44.0%) of those complaining of hypersensitive teeth, males accounted for 42.2% while females accounted for 49% comparison of dentinal hypersensitivity according to gender was statistically non significant ( $P=0.247$ ) table 2. The results showed that Frequency of brushing tooth and experience of hypersensitivity is statistically significant ( $p < 0.001$ ) but Odds ratio risk was 0.004 those with having most mentioned 164 subjects out of 171 subjects having 2 times of brushing experienced dentinal hypersensitivity. The odds ratio for use of fluoridated dentifrice was 0.365 which was again statistically significant. Frequency of consumption of junk foods and sweet candies and frequency of consumption of green leafy vegetables was not statistically significant with an Odds ratio of 0.046 and 0.827 respectively. Individuals consuming fizzy drinks were at more than 1.75 times greater risk of developing dentinal hypersensitivity than others; while those frequently consuming (OR=1.64) were at almost similarly at risk of developing dentinal hypersensitivity. Consumption of fizzy drinks with meals (OR=4.304) and History of consumption of aerated drinks (OR=3.04) were significantly associated with dentinal hypersensitivity ( $p < 0.001$ ).

Table 1: Distribution of study subjects according to age and gender

Gender	Frequency	Mean age	Std. Deviation	Mean age
Male	287	25.19	2.73	25.34 ± 2.79
Female	102	25.79	2.95	

p > 0.05. Non Significant

Table 2 Comparison of dentinal hypersensitivity according to gender

		Dentinal hypersensitivity		Total
		Present	Absent	
Gender	Male	121	166	287
		42.2%	57.8%	100.0%
	Female	50	52	102
		49.0%	51.0%	100.0%
Total		171	218	389
		44.0%	56.0%	100.0%

Table 3 Risk factors and their association with Dentinal hypersensitivity

Questions	Response	Dentinal hypersensitivity		Odds ratio and p value
		Present	Absent	
Frequency of brushing tooth	Once daily	7	200	OR = 0.004 p < 0.001***
	Twice daily	164	18	
Use of fluoridated paste	Yes	80	154	OR = 0.365 p < 0.001***
	No	91	64	
Frequency of Consumption of junk food and sweet candies	Frequently	126	169	OR = 0.812 p = 0.405*
	Rarely	45	49	
Frequency of consumption of green vegetables	Regularly	43	63	OR = 0.827 P = 0.424*
	Occasionally	128	155	
Consumption of fizzy drinks	Yes	99	96	OR = 1.75 P = 0.008**
	No	72	122	
Frequency of consumption of fizzy drinks	Frequently	112	117	OR = 1.64 P = 0.022**
	Rarely	59	101	
Consumption of fizzy drinks with meals	Yes	117	73	OR = 4.304 p < 0.00***
	No	54	145	
History of consumption of aerated drinks	Yes	100	69	OR = 3.041 p < 0.001***
	No	71	149	

\* - Non Significant, \*\* - Significant, \*\*\* - Highly Significant.

## 5. DISCUSSION

The present study did not consider age groups older than 30 years of age. As dentinal hypersensitivity is multi factorial and chronic in nature, presence of dentinal hypersensitivity in an older individual can be attributed to various reasons. Since area of interest of the study was association of dentinal hypersensitivity with diet and dietary habits only, the older age groups were excluded. The erosive possibility of an acidic drink is reliant on upon the direct effect on the tooth surface,<sup>21</sup> the drinking method <sup>22</sup> and therefore the shielding effect of saliva.<sup>23-25</sup> It's also been described that application of the many acidic drinks alters dentine permeability even after brushing procedures with and without toothpaste.<sup>26</sup> Furthermore, the dentine permeability after brushing with toothpaste was pretty much less than that detected after brushing without toothpaste, which was successively below that observed with a earlier application of acid. In step with these results, we will say that tooth-brushing shouldn't instantly follow ingestion of acidic drinks but should be parted from mealtimes. Additionally, Ponduri et al., (2006) exhibited that the amalgamation of abrasion and erosion led to significant loss of dentine than erosion alone. It absolutely was also established that fluoride toothpaste could provide a partial protection against erosion, which supports the concept of brushing before meals.<sup>27</sup> Present study reported sophisticated prevalence of dental sensitivity problems among those who drink fizzy drinks and aerated drinks. This association was robust between extended history of consumption and occurrence of dentine hypersensitivity because the acidic pH of these drinks liquefies the outer mineral layer of the enamel thus exposing the dentinal tubules. These results were similar to those reported by Bo Liu et al <sup>28</sup> who stated that subjects consuming acidic foods and drinks were at a slightly higher risk to develop tooth wear and sensitivity. Bartlett et al<sup>29</sup> and Zero et al<sup>30</sup> also reported similar findings in their study that dentinal hypersensitivity following tooth wear was statistically significantly associated to acidic foods and drinks. The effect like such is intensified when mechanical tooth wear occurs concurrently when the brushing techniques are insufficient. During this regard, a frequent sip of water is useful for neutralizing the pH of oral fissure thereby preventing the teeth from the acid associated tooth surface loss. Currently the consumption of sweetened beverages is becoming mutual in low and middle income countries.<sup>31</sup> Although such drinks attract people from all age groups however adolescent and young adults are highly susceptible for his or her amplified tendency towards socialization, exam stress and instant energy boost, etc. A longitudinal study over Swedish adolescent observed advanced risk of developing dental erosion in between meal drinkable users.<sup>32</sup> Although brushing frequency and usage of fluoridated tooth paste was assessed in our study. But our data was lacking information over other tooth mineralization factors like calcium rich beverages which makes teeth immune to erosive wear and this might need slanted our findings to an extent.<sup>33</sup> There were some important limitations and associated biases. We failed to question about depletion of steroid inhalers within the case of participants with known history of asthma as its relation with dental erosion continues to be a debate. Furthermore, to the present we couldn't infer the occurrence of dental sensitivity with relevance a particular gender because the proportions weren't balanced in our case. This research study relied on self-reported measure for measuring dental sensitivity. The results of this study would be more precise if the end result measure was further authenticated by clinical parameters. A Cross

sectional study over Nigerian under graduate students following the comparable parameters as employed in this research couldn't establish an association between dental sensitivity and carbonated drink usage.<sup>34</sup> Though, cross sectional nature of this study cannot determine progressive nature of this relation and more evidence is required during this regard.

## 6. CONCLUSION

The present study has described dentinal hypersensitivity among consumers of acidic beverages. Nevertheless, additional research is mandatory to ascertain the causative association of those drinks through analytical studies.

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