



# Prevalence of Dentin Hypersensitivity in a Target Subjects in Hanoi, Vietnam

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## Abstract

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**BACKGROUND:** Dentin hypersensitivity (DH) is a short pain when dentin is exposed to external stimuli such as: Thermal, vapor, rubbing, osmotic, or chemical stimuli without pathological or any other dental defect and in normal teeth, that level of stimulation is not sufficient to cause pain. Besides tooth decay and periodontal disease, DH is the top concern of Odonto-Stomatology doctors.

**AIM:** The aim of this study was to study the prevalence of DH in Hanoi, Vietnam, in two groups (workers at Hanvico Company and dental students at the University of Medicine and Pharmacy, VNU, Hanoi, Vietnam).

**MATERIALS AND METHODS:** The study was conducted on 500 subjects which consisted of 288 workers at Hanvico Company and 212 Odonto-Stomatology students at the University of Medicine and Pharmacy, VNU. The study subjects were examined intraorally and diagnosed with DH to vapor and tactile stimuli using the Yeaple Probe electronic probe.

**RESULTS:** It was found that the prevalence of DH is 20.4% in Hanoi, Vietnam, with no difference between men and women. The highest prevalence of DH is in group 40–49 years of age group.

**CONCLUSION:** It was found that there is a moderate prevalence of DH in Hanoi, Vietnam. The cervical wear, tooth wear, gingival shrinkage, and a diet high in acid showed a high prevalence of DH.

## Introduction

Dentin Hypersensitivity (DH) can be explained as a short pain when dentin is exposed to external stimuli such as: thermal, vapor, rubbing, osmotic or chemical stimuli without pathological or any other dental defect and in normal teeth, that level of stimulation is not sufficient to cause pain [1, 2]. Besides tooth decay and periodontal disease, dentin hypersensitivity is the top concern of Odonto-Stomatology doctors [2, 3]. The percentage of dentin hypersensitivity reported in many studies is variable, from 3-57% [3-7]. Another systematic search found that the prevalence of DH can range from 3 to 98 % [8]. Meanwhile, Rees' study determined that the prevalence of dentin hypersensitivity in the UK accounted for 3.8% [9]. In Vietnam, according to the research by Son et al. conducted at a Vietnamese insurance company, the rate of dentin hypersensitivity is about 47.7%, concentrating on the 22-58 years of age

group [10]. In 2013, Thao et al. conducted a study on dentin hypersensitivity in adults in Ho Chi Minh City with a rate of 85.8 % [11]. There was a difference between studies in the proportion of DH because they were conducted in different communities with differences in lifestyle, level of awareness, and eating habits. The group of 20–50 years old usually suffers from DH, mostly in 30–40 years old.

Most of the studies on DH in Vietnam were carried out on specific subjects such as students, employees, and people with teeth whitening. In 2010, Uyên [12] conducted a study on DH on 500 students of the University of Medicine and Pharmacy in Ho Chi Minh City in 18–28-year-old age groups. Similarly, in 2013, Diep did another study on DH on 100 people in the 18–28 age group who needed whitening teeth at home based on two types of stimuli: Cold stimuli and vapor stimuli [13]. There is a lack of studies on DH in Hanoi, Vietnam. Hence, this study was to study the prevalence of DH in Hanoi,

Table 1: Rate of dentin hypersensitivity by gender

Subject	Male		Female		Total		p
	DH (%)	No DH (%)	DH (%)	No DH (%)	DH (%)	No DH (%)	
VNU-HN	16 (15.1)	90 (84.9)	17 (16)	89 (84)	33 (15.6)	179 (84.4)	0.85
HANVICO	15 (21.1)	56 (78.9)	54 (24.9)	163 (75.1)	69 (24)	219 (76)	0.52
Total	31 (17.5)	146 (82.5)	71 (22.0)	252 (78.0)	102 (20.4)	398 (79.6)	0.236

**Table 2: Rate of dentin hypersensitivity by age**

Subject	<20 years (%)		20–29 years (%)		30–39 years (%)		40–49 years (%)		≥50 years (%)		Total (%)	
	DH	No DH	DH	No DH	DH	No DH	DH	No DH	DH	No DH	DH	No DH
VNU-HN	9 (16)	46 (84)	24 (15)	132 (85)	0 (0)	1 (100)	-	-	-	-	33 (15.6)	179 (84.4)
HANVICO	0 (0)	1 (100)	5 (11)	39 (89)	20 (24)	63 (76)	38 (30)	88 (70)	6 (18)	28 (82)	69 (24)	219 (76)
Total	9 (16)	47 (84)	29 (15)	171 (85)	20 (24)	46 (76)	30 (30)	88 (70)	6 (18)	28 (82)	102 (20.4)	398 (79.6)

Vietnam, in two groups (workers at Hanvico Company and dental students at the University of Medicine and Pharmacy, VNU, Vietnam). This study also evaluated the relationship between DH and some related factors.

## Materials and Methods

### Study details

This is a cross-sectional and descriptive study.

### Study subjects

The study is done in two groups (workers at Hanvico Company and dental students at the University of Medicine and Pharmacy, VNU, Hanoi, Vietnam). Inclusion criteria included both males and females, aged 18–50 years old, studying/working at the University of Medicine and Pharmacy – Vietnam National University, Hanoi, and Hanvico company during the investigation period. The exclusion criteria included people with acute systemic disease or malignant diseases in the oral cavity, who used anti-inflammatory, sedative drugs pain relievers within 72 h before participating in the study, who received periodontal surgery, orthodontic treatment, teeth whitening within the previous 6 months, and could not participate in the study and did not appear during the investigation.

### Methods

General information about the study subjects was asked. Then, the subjects were interviewed regarding their eating habits and nutrition. After that, all teeth were clinically examined (except wisdom teeth and caries) to detect tooth tissue damage (cervical wear, gingival shrinkage, and tooth wear) and DH by two methods: Tactile stimuli (using the Yeaple Probe electronic probe) and vapor stimuli (using the dental chair's vapor head with the pressure of 45 psi). Subjects were noted as having DH when there was DH to either stimulus or both.

### Statistical analysis

Data were analyzed using the Epi Data 3.2 software and statistically analyzed using SPSS 20.0 software.  $p = 0.05$  was considered a significant difference.

## Results

### DH was related to gender

The rate of DH by gender is shown in Table 1. The rate of DH seen in the male group was 17.5% and 22% in the female group. Among students at VNU, this rate is 15.1% and 16%. The rate of DH among employees of Hanvico company is 21.1% and 24.9%. The gender difference was not statistically significant ( $p > 0.05$ ).

Table 2 shows the highest rate of DH was found in the age group of 40–49 years old (30% of subjects), followed by the age group of 30–39 years old (24% of subjects).

The rate of DH is most common in the 40–49-year-old group (30%) which could be explained by the age group over 40 who began to have symptoms such as gingival shrinkage, cervical wear, periodontal disease, then 30–39 years old group (24%), over 50 years old (18%). According to the research results of Sơn [13] in 2013 on employees of the insurance company, the rate of DH accounted for 47.7%, concentrating in the 22–58 age group. This was consistent with previous studies that recorded the highest rate of DH in 30–40 years old.

### The rate of DH was related to eating habits and nutrition

In Table 3, the rate of DH in subjects who regularly used foods containing a lot of acids was similar to that of subjects who did not/did not use them regularly.

**Table 3: Rate of dentin hypersensitivity related to some eating habits and nutrition**

Subject habit	VNU-HN			HANVICO			Total		
	DH	No DH	p	DH	No DH	p	DH	No DH	p
Use acidic foods									
Frequent	10 (27%)	27 (73%)	0.034	3 (12%)	22 (88%)	0.143	37 (20%)	145 (80%)	1
No/Not often	23 (13%)	152 (87%)		66 (25%)	197 (75%)		65 (20%)	253 (80%)	
Milk/milk products									
Frequent	22 (19%)	94 (81%)	0.133	14 (21%)	52 (79%)	0.552	36 (20%)	146 (80%)	0.795
No/Not often	11 (12%)	85 (88%)		55 (25%)	167 (75%)		66 (21%)	252 (79%)	
Calcium supplementation									
Frequent	5 (17%)	24 (83%)	0.789	16 (25%)	47 (75%)	0.762	21 (23%)	71 (77%)	0.523
No/Not often	28 (15%)	155 (85%)		53 (24%)	172 (76%)		81 (20%)	327 (80%)	

**Table 4: Rate of dentin hypersensitivity associated with some tooth tissue damage**

Subject hurt	VNU-HN (%)			HANVICO (%)			Total (%)		
	DH	No DH	p	DH	No DH	p	DH	No DH	p
Gingival shrinkage									
Yes	14 (35)	26 (65)	0.031	22 (27)	61 (73)	0.567	36 (29)	87 (71)	0.057
No	19 (11)	153 (89)		47 (23)	158 (77)		66 (18)	311 (82)	
Cervical wear									
Yes	18 (62)	11 (38)	0.001	55 (43)	74 (57)	0.004	73 (46)	85 (54)	0.003
No	15 (8)	168 (92)		14 (9)	145 (91)		29 (8)	313 (92)	
Tooth wear									
Yes	10 (50)	10 (50)	0.035	19 (25)	56 (75)	0.685	29 (31)	66 (69)	0.034
No	23 (12)	169 (88)		50 (27)	163 (73)		73 (18)	332 (82)	

Meanwhile, the rate of DH in subjects who regularly used milk was higher than that of subjects who did not use/did not regularly use milk, the difference was not statistically significant. And regular calcium supplementation did not affect the rate of DH.

### **The rate of DH was related to some risk factors**

Gingival shrinkage, cervical wear, and tooth wear were three risk factors for DH. With the ratio of every two teeth with damage (cervical wear, tooth wear, or gingival shrinkage), there was one tooth with DH, the difference was statistically significant (Table 4). This was consistent with the potential infection which caused DH [3].

## **Discussion**

There is a high prevalence of DH in various populations [4], [10], [12], [14], [15]. The overall rate of DH in the study was 20.4% (Table 5) which is lower than that of the other studies conducted in Vietnam and similar studies in Europe conducted on groups of subjects [4], [10], [11], [13]. Similarities this difference can be attributed to the increasing demand for oral healthcare today, general oral health-care products and preventive products as well as oral health-care products. Treatment of DH is increasingly diversified and accessible to the public to help improve oral health in general.

**Table 5: The prevalence of dentin hypersensitivity according to some similar studies**

Study	Subjects	Sample size	Rate of DH
Clayton <i>et al.</i> , 2002 [4]	Staff	228	50%
Uyên, 2010 [11]	Student	500	48%
Son, 2012 [13]	Staff	155	47.29%
Thào <i>et al.</i> , 2013 [10]	Community	871	85.8%
This research	Staff + students	500	20.4%

When compared to other studies in done in Vietnam, the study by Uyên conducted over 500 students in Ho Chi Minh City found a DH rate of 48% [12] and the study by Diep carried out on 100 subjects showed a rate of 47% [13]. There was no difference between men and women. The reason for the difference in the rate of DH in Hanoi and Ho Chi Minh City may be due to the following reasons. First, the two studies used different stimuli, and second, the research at the University of Medicine

and Pharmacy in Ho Chi Minh City was conducted on diverse groups of students. While our study focused on two groups of subjects, students from the University of Medicine and Pharmacy – VNU and employees at Hanvico Hanoi company. At the University of Medicine and Pharmacy, Vietnam National University, Hanoi, the research subjects were Odonto-Stomatology students who have knowledge of oral health, so they know how to brush their teeth, as well as use effective toothpaste to avoid tooth sensitivity. The eating habits between Hanoi and Ho Chi Minh City. People in Ho Chi Minh City have a habit of eating more sour and spicy foods than in Hanoi which led to more sensitivity of teeth in Ho Chi Minh City.

Recently, there has been increasing the non-carious cervical lesions in youths associated with people's lifestyles and youths [16]. These lesions can cause DH. Three factors exposed the dentin area with dentinal tubules through the oral environment. Many studies also noted an association between the three factors mentioned above and DH [17]. Cervical or tooth wear was the result of an accumulation of many factors: Abrasion, oral hygiene habits, and an acidic diet. Demirci *et al.* [15] found that the factors related to DH are gender (female), age group (31–40 years of age), housewives, high school students, medium brushes, brushing twice per day, and circular brushing method. The DH can be controlled by considering the patients' demographics, etiologic, and predisposing factors [15]. Universal adhesive with Nd: YAG has been also found an effective alternative the DH as they can occlude the dentinal tubules and increase the resistance to dentinal permeability [18].

Finally, the limitations of this research can be the limited sample size. This study can be extended to Vietnam or other countries to include more study samples and study the details of the factors associated with the DH.

## **Conclusion**

Within the limitation of this study done in 500 subjects in Hanoi, Vietnam, the following conclusions can be drawn:

1. The prevalence of DH in Hanoi adults was 20.4% and no difference between men and women

2. DH was most common in the 40–49 age group
3. DH was strongly associated with several risk factors including cervical wear, tooth wear, gingival shrinkage, and consumption of acidic foods.

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