Prevalence of Dentin Hypersensitivity and its Associated Factors: A Hospital-Based Cross-Sectional Study Khamis Musiht, Saudi Arabia, 2020

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Abstract

Introduction: Due to harmful lifestyles and unhealthy diets, such as the consumption of acidic, soft and energy drinks, the number of adults with dentin hypersensitivity (DH) is increasing. Aggressive toothbrush use increases the number of patients requiring regular dental care. DH is defined as sharp pain arising from exposed dentin in response to chemical, thermal, tactile, evaporative, or osmotic stimuli that cannot be attributed to any other dental defect or disease. Some authors have described it as the "common cold of dentistry". DH has a negative impact on daily activities and thereby leads to poor oral health-related quality of life. This study aimed to assess the prevalence of DH, the relative importance of risk factors, patient habits and oral health behaviors and the role of dental practices in DH.

Methods: In the outpatient department of Khamis Mushait General Hospital in Saudi Arabia, a cross-sectional study using a questionnaire and a clinical examination was conducted using random sampling. The sample size calculation assumed a 95% confidence level, 5% sampling error and a 42% probability of occurrence according to a previous study in Saudi Arabia. The minimum required sample size was calculated to be 190. There were 220 eligible participants who agreed to participate and provided written informed consent. They were interviewed and then underwent clinical examinations to identify those with DH. The second examination was performed to exclude confounders, such as cracked or chipped teeth, fractured restorations, sound restorations, dental caries, root caries, postoperative sensitivity, vital bleaching procedures, abrasions, attrition and erosion. The outcome variable "tooth hypersensitivity" was assessed with both the Schiff scale and air blast tolerance evaluations to determine the outcome and sensitivity parameters were measured.

Results: There were 220 participants with 55% males and 45% females. The mean age was 39 years of age. Married participants accounted for 62%, while 29% were single. There were 86% employed participants and 14% unemployed participants. The only significant relationship between DH and sociodemographic variables was education (p = 0.005). The crude prevalence of DH was 38.5% and after excluding other factors, it was 15% for sound teeth. According to the Schiff scale, 3.2% had a score of 3, 14.1% had a score of 2, 10.9% had a score of 1 and 71.8% had a score of 0. The most common hard tissue factors associated with DH were dental caries (12%), fractured restorations (10%) and sound restorations (10%), while the most common soft tissue factor was gingival recession (11.4%). The most frequent medical conditions were heartburn (28.6%) and (14%) gastroesophageal reflux disease (GERD), while the other medical history such as diabetes, hypertension and depression had no significance. The frequency of soft drink consumption was 63.6%, while 31.8% consumed energy drinks, 78.6% consumed acidic drinks and 62.3% consumed dairy products. The smoking prevalence was as follows: cigarette smoking was 20.4%, while 9% used Shisha, 5% used smokeless tobacco and 1.4% used e-cigarettes. Soft brush users accounted for 49.5%. According to stepwise regression, there was a significant association between DH and gingival recession (p = 0.000) and between DH and sound restorations (p = 0.069).

Conclusion: The answer "yes" or "no" for pain from cold stimulus found the prevalence of DH to be 38% in total, but only 15% after hard and soft tissue factors were excluded. This demonstrates the importance of clinical examinations to obtain the best estimation of prevalence. This study also shows that gingival and periodontal health is important for the prevention of DH and that there is a need for more awareness programs about self-management of DH using hospital-based dispensers for gel and paste.

Keywords: Dentin Hypersensitivity (DH); Gastroesophageal Reflux Disease (GERD);

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Introduction

The definition of tooth hypersensitivity is a short sharp pain in response to stimuli, which include cold water, hot tea, coffee and air [1]. According to the American Dental Association, it is the second most common among the top ten reasons for dental clinic visits in the world. It is a widespread and significant problem in dental clinics in Saudi Arabia, with a prevalence of 42 - 60% [2]. The latest systematic review and meta-analysis of 65 articles worldwide reported the average prevalence to be 33.5% (95% CI: 30.2% - 36.7%) [3]. It indicated that tooth hypersensitivity was the third most common reason for visits to dental clinics after tooth pain and tooth decay. Tooth hypersensitivity makes up a considerable amount of the caseload for dentists in general dental practice and it is time-consuming for patients because they need to wait a long time for knowledge about preventive measures. Therefore, the solution to this issue must be specifically aimed at reducing the risk of dentin exposure as a result of either loss of enamel, which is mainly caused by erosion, or removal of cement, which is most often due to either aggressive tooth brushing in a healthy mouth or periodontal disease and treatment [4].

Literature Review

The prevalence of tooth hypersensitivity in Saudi Arabia is 42 - 60% [2] this prevalence reflect the significant impact of the problem and the need for new research and data to give for stockholders in this field to more management. Tooth hypersensitivity occur when the dentin (one of the significant tooth components) is exposed. It's come alone, or it could be part of tooth decay, periodontal disease, bruxism, abrasion and acid exposure. Other causes can be due to dental treatment such as filling marital, scaling polishing, tooth whitening [3]. The popular extensive use theory explain tooth sensitivity hydrodynamic theory that say the movement of fluid inside dental tubule in response to stimulus cold, hot, air and mechanical like biting or chewing [4].

Many factors affect and are relevant to tooth hypersensitivity. First, this article will discuss the prevalence of tooth hypersensitivity, mainly in the 18 - 44 year age range and to a lesser degree in older patients [5]. Second, the gingival recession that leads to tooth-root exposure by lowering or loss of gum tissue is a correlated factor because it tends to increase tooth hypersensitivity [6]. Third, tooth attrition results in abnormal tooth-to-tooth contact, which leads to loss of the tooth's hard tissue. This can cause hypersensitivity if the nerve becomes exposed [7]. Fourth, erosion occurs when acid dissolves the enamel layer of hard tissue that protects the tooth. Erosion is caused by excessive consumption of soft drinks or any highly acidic drinks or by vomiting stomach acid contents, which occurs in some diseases like anorexia nervosa [8]. Fifth, bruxism, which is involuntary and excessive tooth grinding while sleeping, talking and eating, affects tooth hypersensitivity [9]. Sixth, occlusal trauma results in tooth damage when the relationships of opposing teeth are abnormal [10]. Seventh, abnormal tooth position, which refers to teeth not being in their normal position in the oral cavity, affects tooth hypersensitivity [11]. Eighth, dental treatments in the clinic can affect tooth hypersensitivity. Filling, periodontal treatment, such as scaling to remove plaque and calculus and some types of periodontal surgery, such as gingivectomy (removal of part of the gum in patients with gum excessive gingival display), can lead to tooth hypersensitivity by exposing tooth roots [12].

Methods

This cross-sectional study included a questionnaire and a clinical examination. The study was approved by an Institutional Review Board or approval committee and that it was conducted in accordance with the Declaration of Helsinki. It was conducted among eligible participants who agreed to participate and gave their written informed consent. The first clinical examination was conducted in order to identify the participants with DH. The second examination was performed to exclude other factors, such as cracked or chipped teeth, fractured restorations, sound restorations, dental caries, root caries, postoperative sensitivity, vital bleaching procedures, abrasions, attrition and erosion.

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Outcome variable

Measurement of the outcome variable "tooth hypersensitivity" depended on using both the Schiff scale and air blast tolerance evaluations to measure the outcome of the sensitivity parameters. A Schiff Index score of 1 or more on at least one tooth surface indicated that DH was present.

The teeth were cleaned using compressed air and tested with good lighting under standard dental operating conditions without magnification [13]. Both tooth surfaces were tested with the buccal/buccocervical, occlusal/incisal and oral soft and hard tissue factors.

Inclusion and exclusion criteria:

The inclusion criteria used:

1.   Adults age 18 years and above attend the clinic of Khamis Mushait general hospital.

2.   Both male and female.

3.   Saudi patients only.

The exclusion criteria are the following:

1.   Any patient under orthodontic treatment. (dental braces): The use of devices to move teeth or adjust underlying bone. Because it's cover most of the buccal tooth surface and affect the examination.

2.   Complete Edentulous patient (toothlessness is the condition of being toothless completely).

3.   Non-natural tooth patient. (the teeth cover with any biomaterial like porcelain or metal not include in examination the full coverage but not mean filling material like amalgam or composite).

Study area

Khamis Mushait or Khamis Mushayt is a city in south-west Saudi Arabia, located east of Abha, the provincial seat of the Asir province, 884 kilometers from the national capital of Riyadh. The population 1,134,000 (Department of Statistics and Information 2015).

Study setting

Khamis Mushait General Hospital 200 bed capacity run by the Ministry of health. The Khamis Mushait General Hospital outpatient department has 20 clinics with a different specialty. The daily average of patient flow 40case for screening dental clinic. The study was done in dental clinics. This is a general clinic that triages the patient and refers him to the dental center. If they need more comprehensive treatment, the researcher will be responsible for doing the examination. The examination and interview take in the range of about 15 - 20 minutes for each participant.

Study population

Male and female patient adult (aged ≥ 18 years) in dental clinic Khamis Mushait General Hospital.

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Sampling technique

Systematic random sampling after each 4th patient enters the dental clinic from the daily list in all weekdays and morning afternoon shift. This choice based on the trail in a pilot study. The daily list has 40 patients and the daily target for the study was ten and the average time for examination 15 - 20 min then we divide 10/40 = 4 the fixed interval.

Sample size

A prevalence rate of 42% was found by Taani and Awartani, 2002 [3]. The formula used to calculate the sample size is as shown:

Sample size n = Z2P(1-P)/C2

Z = Index confidence level of 95% which is 1.96 P = Confidence level

C = 1 - confidence level N = 1.96(.42)(1-.42)/(1-.95)^2N = 190Add 15 % for non-response N = 220.

Study tools

A structured, closed-ended interview questionnaire was prepared along with a clinical examination form to be used with the participants by the researcher involved in the study. The same author was also responsible for answering the queries raised by the respondents. The study instrument was designed after an extensive literature review [14-20]. The first draft of the questionnaire was prepared and then validated by requesting the opinion of dental public health experts concerning simplicity and importance. The questionnaire was divided into three parts. The first part was comprised of sociodemographic information. The second part consisted of questions about medical history and the third part asked about dental habits, behaviors and practices related to DH. After the questionnaire was completed, the clinical examination was performed.

Data management

Data will be collected both papers based on sing every participant in informed consent then enter on the same day with clinical examination form to data extraction sheet with save for both confidentiality and privacy. The endnote eight will use for reference management. The STATA 13 was used for data analysis.

Data analysis plan

Descriptive statistics in the form of frequency and percentage were compiled using cross-tabulation. Statistical analysis included the Chi-square test with $p < 0.05$ considered statistically significant. Multiple stepwise forward logistic regression was used with the predictor DH as the outcome variable (DH as Yes/No). Ordinal logistic regression was used for the outcome of the Schiff scale, with 0-3 as the predictors.

Result

There were 220 participants with a mean age of 39.2 +/- 14.6 years. There was no statistically significant relationship between age and the outcome of the survey (DH). There were 121 (55%) males and 99 (45%) females and sex was not associated with outcome. Most of the participants (62.2%) were married, 29% were single, 3.6% were divorced and 4% were widowed. According to occupational status, 36% were professional, 21% were students, 16% were employed, 14% were unemployed, 7% were retired and 6% were private (non-government). According to Fisher's exact test, the occupation was not significantly associated with DH. In terms of education, 51.3% had higher than high school education, 36.6% had a high school education, 5.4% had an intermediate education and 6.3% were illiterate. The only statistically significant relationship between any sociodemographic and DH was education.

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Table presents data regarding the relationship between medical history and DH. Of importance is increased acid production and pH change in the oral environment. There was a previous diagnosis of anorexia nervosa in 2% of the participants (p = 0.340), gastroesophageal reflux disease (GERD) was present in 14% (p = 0.667) and 30% reported heartburn symptoms (p = 0.057). No participants reported antidepressant use. Only 2% were using an antiepileptic medication and 5% were using analgesics, which could have affected the sensation of pain with cold stimulus.

Table presents some habits that may affect tooth and oral health. Soft drinks are high in sugar and have an acidic pH, so they increase the activity of caries and demineralization of the enamel surface. The prevalence of self-reported consumption of more than one cup or can of soft drinks daily was 63.6% (p = 0.432). Energy drinks were consumed by 31.8% (p = 0.839) and acidic drinks by 78.6% (p = 0.629). Conversely, dairy products have an alkaline pH and are rich in calcium, which helps remineralize teeth. They were consumed by 62% (p = 0.167) of the participants. Different types of smoking are harmful to oral health. The prevalence for cigarette smoking was 20.4% (p = 0.745), while 9% (p = 0.844) used shisha, 5% (p = 0.011) used smokeless tobacco and 1.4% used e-cigarettes.

The findings for dental behavior included 49.5% (p = 0.603) of participants who used soft toothbrushes. In comparison, 50.5% did consider this a risk factor, even though aggressive or hard tooth brushing causes loss of tooth structure, especially enamel, which is related to gingival recession. Whitening toothpaste was used by 5.4% (p = 0.438) of the participants. Only 68% of this high present reflects the need for awareness to be raised. The frequency of tooth-brushing was 21.3% for twice daily (which is ideally recommended) and 56.3% for once daily, while 20% did not brush at all and 2.4% more than two times. The most popular motion used while brushing was vertical (71.3%), followed by 4% who used a circular motion and 4% who used a horizontal motion. This question was not applicable to non-toothbrush users. The prevalence of dental floss use for better interproximal tooth space health was 4%. The frequency of toothbrushing daily was 77.6%. The use of toothpicks was 69.5% and there was no significant association with DH (p = 0.984). Bruxism was present in 4.5% of participants. The habit of chewing one's nails with one's teeth was 2.2% and 7.2% indicated that they snored and/or breathed from the mouth during sleep. None of these factors was significantly associated with DH, which may be related to an insufficient sample size.

Some practices may be related to decreasing or managing DH. First, 11.3% had previously visited a dentist for the problem, which was statistically significant (p = 0.000). Second, 3.6% had used previous treatments to decrease DH. Only 0.4% indicated that they used nightguards. Self-treatment pastes or gels were used by only 2.2% of the participants and only 1.6% had undergone specialized treatment. All these statistics demonstrate a lack of awareness about this health issue and the availability of different types of treatment and management that can help resolve DH and improve oral health-related quality of life.

The clinical examination found the prevalence of pain with cold water and air in sound teeth to be 15%. The prevalence of hard tissue factors is shown in table. For soft tissue factors, 11.3% had a gingival recession, which had a significant relationship with DH (p = 0.000). Finally, 9.5% had gingival inflammation (p = 0.002) and 7.3% had bleeding (p = 0.002). The odds of DH are 18.6 in participants with gingival recession after controlling for all hard and soft tissue variables. The odds of DH are 2.5 in participants with sound restorations after controlling for all hard and soft tissue variables.

The odds of dentin hypersensitivity are 18.6 in a participant with gingival recession after controlling for all hard and soft tissue variables. The odds of dentin hypersensitivity are 2.5 in a participant with sound restoration after controlling for all hard and soft tissue variables.

The dentin hypersensitivity is 13.24-time odds in a participant with gingival recession compare thus not have.

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Variable	Descriptive analysis	N (%)
Age	Mean = 39.2 SD = 14.62	
Gender	Female	99 (45%)
	Male	121 (55%)
Marital status	Single	64 (29%)
	Married	138 (62.7%)
	Divorced	8 (3.64)
	Widow	10 (4.5%)
Occupation	Unemployed	31 (14%)
	Students	46 (21%)
	Professional (White-collar)	79 (36%)
	Worker (Blue-collar)	48 (21.8%)
	Retirement	16 (7%)
Education	Bachelor and above	113 (51.3%)
	Below Bachelor	93 (42.2%)
	Illiterate	14 (6.3%)
Variable	Yes N (%)	No N (%)
Anorexia nervosa	2 (0.9%)	218 (99.1%)
GERD	20 (9%)	200 (90.9%)
Heartburn	63 (28.6%)	157 (71.4%)
Depression medications user	6 (2.7%)	214 (97.3%)
Epilepsy medications	4 (1.8%)	216 (98.2%)
Other medical histories	One chronic disease 50 (22.7%)	One chronic disease 170 (77.3%)
	More than one chronic disease 17 (7.7%)	More than one chronic disease 203 (92.3%)
Variable	Yes N (%)	No N (%)
More soft drinks	140 (63.6%)	80 (36.4%)
More energy drinks	70 (31.8%)	150 (68.2%)
More citrus juice	173 (78.6%)	47 (21.4%)
More dairy products	137 (62.2%)	83 (38.8%)
Cigarettes smoking	Current = 45 (20.4%) Ex.Smoker = 8 (3.6%) Non-smoker = 167 (75.9%)	
Shisha	Current = 20 (9%) Ex.Smoker = 3 (1.4%) Non-smoker = 197 (89.5%)	
smokeless tobacco	Current = 11 (5%) Ex.Smoker = 1 (0.4%) Non-smoker = 208 (94.5%)	

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Variable	Yes N (%)	No N (%)
Use a soft toothbrush	Yes = 109 (49.5%)	No = 111 (50.45%)
Use whiting toothpaste	Yes = 12 (5.4%)	No = 208 (94.6%)
Brush tooth regular	Yes = 150 (68.2%)	No = 70 (31.8%)
Frequency of tooth brushing /day	Not at all 42 (19%) Once 146 (66.3%) Twice 30 (13.6%) More 2 (0.91%)	
Technique of brushing	Circular method 44 (20%) Horizontal method 124 (56.5%) N.A. 42 (19%) Vertical method Yes 10 (4.5%)	
Use dental floss	Yes = 9 (4.1%)	No = 211 (95.9%)
Use swiak	Yes = 97 (44%)	No = 123 (56%)
Use toothpicks	Yes = 153 (69.5%)	No = 67 (30.45%)
involuntary biting on the teeth (bruxism)	Yes = 10 (4.5%)	No = 210 (95.5%)
Use teeth to cut nails or other	Yes = 5 (2.3%)	No = 215 (97.7%)
Snoring during sleep	Yes = 16 (7.27%)	No = 204 (92.7%)
Variable	Yes N (%)	No N (%)
Visited the dentist every six months	5 (2.3%)	215 (97.7%)
Visited the dentist for dentin hypersensitivity	25 (11.4%)	195 (88.6%)
Previous treatment you use decrease hypersensitivity	8 (3.6%)	212 (96.4%)
Use a nightguard that reduces teeth squeaking during sleep	1 (0.4%)	219 (99.6%)
Use toothpaste and gel helps solve the problem	5 (2.3%)	215 (97.7%)
Use the specialized treatments	3 (1.4%)	217 (98.6%)
Variable	Yes N (%)	No N (%)
Pain with cold water or air sound tooth	33 (15%)	187 (85%)
Pain with cold water or air factors tooth	61 (27.7%)	159 (72.3%)
Cracked tooth	1 (0.4%)	219 (99.6%)
Fractured restorations	11 (5%)	209 (95%)
Sound Restorations	143 (65%)	77 (35%)
Chipped teeth	2 (0.9%)	217 (98.6%)
Dental caries	114 (52%)	105 (48%)
root caries	5 (2.2%)	215 (97.7%)
Postoperative sensitivity	1 (0.4%)	218 (99.6%)
Vital bleaching procedures	1 (0.4%)	218 (99.6%)
Abrasion	2 (0.9%)	217 (98.6%)
Attrition	7 (3.18%)	213 (96.8%)
Erosion	5 (2.2%)	214 (97.3%)
Gingival Recession	25 (11.3%)	195 (88.6%)
Gingival Bleeding	16 (7.3%)	204 (92.7%)

Table 1: Descriptive analysis of all studies variable n = 220.

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Variable	Descriptive analysis	Dentin Hypersensitivity Yes	Dentin Hypersensitivity No	Test	P
Age	Mean+/- SD	43.1+/-2.5	38.5+/-1.06	-1.6746*	0.0954
Gender	Female	15 (15.15%)	84 (84.85%)	0.0032#	0.955
	Male	18 (14.88%)	103 (85.12 %)		
Marital status	Single	6 (9.38 %)	58 (90.63%)	3.6928#	0.297
	Married	23 (16.67%)	115 (83.33%)		
	Divorced	1 (12.50%)	7 (87.50%)		
	Widow	3 (30.00%)	7 (12.50%)		
Occupation	Unemployed	9 (29.03%)	22 (70.97%)	8.3285#	0.080
	Students	3 (6.52%)	43 (93.48%)		
	Professional (White-collar)	10 (12.66%)	69 (87.34%)		
	Worker (Bule-collar)	9 (18.75%)	39 (81.25%)		
	Retirement	2 (12.50%)	14 (87.50%)		
Education	Bachelor and above	15 (13.27%)	98 (86.73%)	9.1056	0.011
	Below Bachelor	12 (12.90%)	81 (81.10%)		
	Illiterate	6 (42.86%)	8 (57.14%)		
	Students	3 (6.52%)	43 (93.48%)		
	Professional (White-collar)	10 (12.66%)	69 (87.34%)		
	Worker (Bule-collar)	9 (18.75%)	39 (81.25%)		
	Retirement	2 (12.50%)	14 (87.50%)		
Anorexia nervosa	Yes	0 (0%)	2 (100%)	Fisher	0.722
	No	33 (15.3%)	185 (84.8%)		
Gastroesophageal reflux disease (GERD)	Yes	6 (30%)	14 (70.0%)	3.882*	0.49
	No	27 (13.5)	173 (86.5%)		
Heartburn	Yes	14 (22.2%)	49 (77.8%)	3.611*	0.057
	No	19 (12.1%)	138 (87.9%)		
Depression medications	Yes	2 (33.3%)	31 (14.49%)	1.626*	0.202
	No	4 (66.7%)	183 (85.5%)		
Epilepsy medications	Yes	0 (0%)	4 (100%)	Fisher	0.519
	No	33 (15.3%)	183 (84.7%)		
Other medical histories		One chronic disease 50 (22.7%)	One chronic disease 170 (77.3%)	18.36*	0.937
		More than one chronic disease 17 (7.7%)	More than one chronic disease 203 (92.3%)		

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More soft drinks	Yes	19 (57.6%)	121 (64.7%)	0.616*	0.432
	No	14 (42.4%)	66 (35.3%)		
More energy drinks	Yes	11 (33.3%)	59 (31.5%)	0.041*	0.839
	No	22 (66.7%)	128 (68.5%)		
More citrus juice	Yes	27 (81.8%)	146 (78.0%)	0.234*	0.629
	No	6 (18.9%)	41 (22.0%)		
More dairy products	Yes	17 (51.5%)	120 (64.2%)	1.912*	0.167
	No	16 (48.5%)	67 (35.82%)		
Cigarettes smoking		Current = 7 (15.5%)	Current = 18 (90%)	1.465*	0.481
		Ex.Smoker = 0 (0%)	Ex.Smoker = 8 (100%)		
		Non-smoker = 26 (15.5%)	Non-smoker = 141 (84.5%)		
Shisha		Current = 2 (10%)	Current = 38 (84.5%)	1.005*	0.605
		Ex.Smoker = 0 (0%)	Ex.Smoker = 3 (100%)		
		Non-smoker = 31 (15.7%)	Non-smoker = 166 (84.3%)		
Smokeless tobacco		Current = 4 (36.3%)	Current = 7 (63.6%)	9.990*	0.007*
		Ex.Smoker = 1 (100%)	Ex.Smoker = 0 (0%)		
		Non-smoker = 28 (13.4%)	Non-smoker = 180 (86.5%)		

Visited the dentist every six months	Yes	0 (0%)	5 (2.7%)	Fisher	0.440
	No	33 (100%)	182 (97.3%)		
Visited the dentist for dentin hypersensitivity	Yes	10 (30%)	15 (8%)	13.826*	0.000
	No	23 (70%)	172 (92%)		
Previous treatment of hypersensitivity	Yes	2 (6.1%)	6 (3.2%)	Fisher	0.343
	No	31 (9.7%)	181 (96.8%)		
Use a nightguard that reduces teeth squeaking during sleep	Yes	0 (0%)	1 (0.6%)	Fisher	0.850
	No	33 (100%)	186 (99.4)		
Use toothpaste and gel helps solve the problem	Yes	1 (3%)	4 (80%)	Fisher	0.560
	No	32 (96.9%)	183 (97.8%)		
Use the specialized treatments	Yes	1 (3.3%)	5 (2.3%)	Fisher	0.387
	No	32 (97.7%)	215 (97.7)		

Use a soft toothbrush	Yes	14 (42.4%)	95 (50.8%)	0.787*	0.375
	No	19 (57.6%)	92 (49.2%)		
Use whiting toothpaste	Yes	1 (3.0%)	11 (5.9%)	Fisher	0.438
	No	32 (97.0%)	176 (94.1%)		
Brush tooth regular	Yes	21 (63.6%)	129 (68.9%)	0.369*	0.543
	No	12 (31.8%)	150 (68.2%)		

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Frequency brash daily			Not at all\7 (15.6%) Once\20 (16.1%) Twice\5 (10.6%) More\1 (25%)	Not at all\38 (84.4%) Once\104 (83.9%) Twice\42 (89.4%) More\3 (75%)	1.149*	0.765
Use dental floss	Yes	1 (3.0%)	8 (4.28%)	Fisher	0.598
	No	32 (97.0%)	179 (95.7%)		
Use swiak	Yes	12 (36.3%)	85 (45.5%)	0.940*	0.332
	No	21 (63.6%)	102 (54.5%)		
Use toothpicks	Yes	23 (69.5%)	130 (85%)	0.0004*	0.984
	No	10 (30.5%)	57 (30.4%)		
involuntary biting on the teeth	Yes	2 (6.1%)	8 (4.2%)	Fisher	0.648
	No	31 (93.9%)	179 (95.7%)		
Use teeth to cut nails or other	Yes	0 (0%)	5 (2.6%)	Fisher	0.440
	No	33 (100%)	182 (97.3%)		
Snoring during sleep	Yes	2 (6.1%)	14 (7.4%)	Fisher	0.559
	No	31 (93.9%)	173 (92.5%)	1-side	

Restorative (hard tissue factors)					
Variable		**Dentin Hypersensitivity Yes**	**Dentin Hypersensitivity No**	**Test**	**P**
Fractured restorations	Yes	7 (11.5%)	4 (2.5%)	Fisher	0.012*
	No	54 (88.5%)	155 (97.5%0		
Sound Restorations	Yes	28 (45.9%)	115 (72.3%)	13.532*	0.000*
	No	33 (54.1%)	44 (27.7%)		
Dental caries	Yes	36 (59%)	78 (49.4%)	1.641*	0.200
	No	25 (47.9%)	80 (50.6%)		
root caries	Yes	3 (4.9%)	2 (1.3%)	Fisher	0.132
	No	58 (95%)	157 (98.7%)		
Abrasion	Yes	1 (1.63%)	1 (0.63%)	Fisher	0.479
	No	60 (98.36%)	158 (99.3%)		
Attrition	Yes	6 (9.8%)	1 (0.63%)	Fisher	0.002*
	No	55 (96.8%)	158 (99.3%)		
Erosion	Yes	3 (5%)	2 (1.7%)	Fisher	0.128
	No	57 (95%)	157 (98.7%)		
Periodontal (soft tissue factors)					
Gingival Recession	Yes	15 (45%)	10 (5.4%)	44.796*	0.000*
	No	18 (54.5%)	177 (94.6%)		
Gingival Bleeding	Yes	8 (24.2%)	8 (4.3%)	16.57*	0.000*
	No	25 (75.8%)	179 (95.7%0		
Gingival inflammation	Yes	9 (27.3%)	12 (6.4%)	14.130*	0.002*
	No	24 (72.7%)	175 (93.6%)		

Table 2: *Bivariant analysis of all suites variable with outcome DH n = 220.*

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Variable	OR	Confidence interval	P.value	OR*	Confidence interval*	P.value*
Gingival Recession	14.75	(5.7-37.5)	0.000	14.02	(5.02-39.08)	0.000*
Sound Restorations	1.82	(0.78-4.27)	0.164	2.94	(1.02-8.44)	0.045*

Table 3: *Multiple stepwise forward logistic regression for outcome DH with predictors n = 220.*

Discussion

This study found the prevalence of DH to be close to the results of previous research from 2002, but this is before the examination and removal of confounders, such as dental caries, cracked teeth and fracture restorations [2]. Soft tissue disease was present in 15% of sound teeth, which is higher than the best estimate of the previous study, 11% [4]. This reflects the difficulty of diagnosing DH and the importance of performing clinical examinations to obtain the best estimate of its prevalence. The study found no relationships between DH and sociodemographic variables, including age, sex and occupation. Medical history was also not significantly associated with DH, while other studies found a significant relationship between DH and GERD or heartburn. The current study found a high prevalence of unhealthy habits, such as soft drink and energy drink consumption, which affects oral health and general health. Smoking, another unhealthy habit, has a major impact on oral health. The dental behavior component of the study found a deficiency in awareness about the importance of oral hygiene and regular toothbrushing.

Among the participants, 78.7% did not use the correct oral care recommended by the dental association, which is brushing twice daily. Regular toothbrushing is the most critical factor in disease prevention and oral health maintenance.

Conclusion and Recommendations

Prevention is always better than cure. First, there is a need for greater awareness about the critically essential role of soft toothbrush use to prevent hard and soft tissue structural damage related to aggressive brushing with hard toothbrushes. Second, patients with DH should be advised to select kinds of toothpaste rich in minerals like calcium and fluoride that help block dentinal tubules and decrease pain compared to regular toothpaste. On the habit side, reducing the consumption of acidic soft drinks and energy drinks helps maintain normal pH and bacterial activity in the oral environment. This helps decrease tooth demineralization, which is a critical factor in keeping the dentinal tubules blocked and reducing symptoms of DH. Quitting the various types of smoking is essential to maintain oral health, especially soft tissue structures.

Strength and Limitation

The main strength of this study is that it is the first epidemiological study of DH in the south region of Saudi Arabia. Another strength is that it was conducted in a hospital setting with clinical examinations, which increases internal validity in measuring outcomes and increases the control of other factors. One limitation is that the patients presented to the hospital seeking care, which may lead to an overestimation of the results and affect generalization. Also, many variables were assessed with the patient report, which may have led to reporting bias. Finally, the exclusion of orthodontic patients may have led to underestimations of the prevalence in this group.

Bibliography

1. Alam BF., *et al.* "Dentine Hypersensitivity and Its Associated Factors: A Cross-Sectional Study Conducted on Patients Visiting Dental Hospital of Karachi, Pakistan". *JPDA* 28.02 (2019): 64.

2. Taani SD and Awartani F. "Clinical evaluation of cervical dentin sensitivity (CDS) in patients attending general dental clinics (GDC) and periodontal specialty clinics (PSC)". *Journal of Clinical Periodontology* 29.2 (2002): 118-122.

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3.   Favaro Zeola L., *et al.* "Prevalence of dentin hypersensitivity: Systematic review and meta- analysis". *Journal of Dentistry* 81 (2019): 1-6.

4.   West NX. "Dentine hypersensitivity: preventive and therapeutic approaches to treatment". *Periodontology 2000* 48 (2008): 31-41.

5.   Silva MS., *et al.* "Prevalence and predictive factors of dentin hypersensitivity in Brazilian adolescents". *Journal of Clinical Periodontology* 46.4 (2019): 448-456.

6.   Chowdhary Z., *et al.* "Multifaceted assessment of dentine hypersensitivity, evaluation of demographic prevalence along with associated fac- tors: A cross-sectional study". *Journal of Indian Society of Periodontology* 23.1 (2019): 64-68.

7.   Teixeira DNR., *et al.* "Relationship between noncarious cervical lesions, cervical dentin hypersensitivity, gingival recession, and associated risk factors: A cross-sectional study". *Journal of Dentistry* 76 (2018): 93-97.

8.   Saba K., *et al.* "Comparison Of Frequency Of Post Operative Sensitivity In Amal- gam Restorations Using Copal Varnish And Dentin Adhesive Liner". *Journal of Ayub Medical College, Abbottabad: JAMC* 30.2 (2018): 163-166.

9.   O'Toole S and Bartlett D. "The relationship between dentine hypersensitivity, dietary acid intake and erosive tooth wear". *Journal of Dentistry* 67 (2017): 84-87.

10. Liang X., *et al.* "Prevalence of dentin hypersensitivity among the residents of Xi'an city, China". *Acta odontologica Scandinavica* 75.6 (2017): 387-393.

11. Naidu GM., *et al.* "Prevalence of dentin hypersensitivity and related factors among adult patients visiting a dental school in andhra pradesh, southern India". *Journal of Clinical and Diagnostic Research: JCDR* 8.9 (2014): Zc48-Zc51.

12. Cunha-Cruz J., *et al.* "The prevalence of dentin hypersensitivity in general dental practices in the northwest United States". *Journal of the American Dental Association* (1939) 144.3 (2013): 288-296.

13. Udoye CI. "Pattern and distribution of cervical dentine hypersensitivity in a Nigerian tertiary hospital". *Odonto-Stomatologie Tropicale = Tropical Dental Journal* 29.116 (2006): 19-22.

14. Gillam DG., *et al.* "Comparison of dentine hypersensitivity in selected occidental and oriental populations". *Journal of Oral Rehabilitation* 28.1 (2001): 20-25.

15. Liu HC., *et al.* "Prevalence and distribution of cervical dentin hypersensitivity in a population in Taipei, Taiwan". *Journal of Endodontics* 24.1 (1998): 45-47.

16. Ali S and Farooq I. "Dentin hypersensitivity: a re- view of its etiology, mechanism, prevention strategies and recent advancements in its management". *World Journal of Dentistry* 4.3 (2013): 188-192.

17. Bekes K., *et al.* "Oral health-related quality of life in patients seeking care for dentin hypersensitivity". *Journal of Oral Rehabilitation* 36.1 (2009): 45-51.

18. Mantzourani M and Sharma D. "Dentine sensitivity: past, present and future". *Journal of Dentistry* 41.4 (2013): S3-17.

19. West NX., *et al.* "Management of den- tine hypersensitivity: efficacy of professionally and self- administered agents". *Journal of Clinical Periodontology* 42.16 (2015): S256-S302.

20. Olley RC., *et al.* "Validation of a Cumulative Hypersensitivity Index (CHI) for dentine hypersensitivity severity". *Journal of Clinical Periodontology* 40.10 (2013): 942-947.

21. Canadian Advisory Board on Dentin Hypersensitivity. "Consensus-based recommendations for the diagnosis and management of dentin hypersensitivity". *Journal Canadian Dental Association* 69.4 (2003): 221-226.

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