



Original Article

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Knowledge of Students and General Practitioners regarding the Treatment of Dentine Hypersensitivity

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ABSTRACT

DHS is an oral health problem occurring in 10–20% of adults that can alter their lifestyle and quality of life. DHS may also be triggered by some routine dental treatments such as scaling and polishing, thus making a regular dental visit unpleasant and distressing for the patient. This cross-sectional study was carried out using an online survey among Riyadh dental students and general practitioners. An online questionnaire was constructed including demographic data and personal questions followed by dentine hypersensitivity patients' exposure, symptoms, treatment, and prevention questions. 14.7% reported that more than 40 patients visit every six months with DHS, 69.5% believed DHS has a major impact on the quality of life, a gingival recession was thought to be the most common cause of DHS (23%), history of hypersensitivity was considered to be the most common method of diagnosing DHS, only 19.1% were extremely confident in correctly diagnosing DHS. There is a need to increase educational material regarding the DHS at undergraduate levels to improve their knowledge and confidence levels.

Key words: *Dentine hypersensitivity, Students, General practitioners, Knowledge*

INTRODUCTION

Dentine Hypersensitivity (DHS) can be explained as "a characteristic short sharp pain resulting from exposed dentine, characteristically in reaction to a range of stimuli comprising of tactile, osmotic, evaporative, thermal, or chemical, that cannot be attributed to any other type of dental defect" [1-3]. DHS is an oral health problem occurring in 10–20% of adults that can alter their lifestyle and quality of life. DHS may also be triggered by some routine dental treatments such as scaling and polishing, thus making a regular dental visit unpleasant and distressing for the patient [4].

A research was carried out in Dammam, Saudi Arabia, among the dental students and dentists, which revealed that DHS was a highly prevalent condition in dental clinics. More than half of the study subjects deemed DHS as a serious problem, and a majority acknowledged that the influence of the DHS on patients' quality of life was moderate to severe. Nevertheless, students were deficient in knowledge and confidence to diagnose and manage the DHS [5].

Another investigation in India disclosed that most dentists (90.2%) reported their patients with the DHS, and 83.4% indicated that up to 25% of their patients deemed DH a major problem. There was a general understanding regarding the current methods underlying DHS, with the majority of dentists ($\geq 66\%$) reporting insufficient

brushing of the teeth as an instigating cause and roughly 50% suggesting periodontal causes along with the other recorded reasons. The most common treatment approach employed by dentists was to prescribe desensitizing agents for home use [6].

In Nigeria, dentists appropriately specified hydrodynamic theory as the most common theory and cold as the commonest stimulus of DHS [7]. The majority of dentists recognized a combination of treatment options that comprised of the use of medications in a dental office (desensitizing agents, F varnishes, dentin bonding agents, glass ionomer cement) and at home (F toothpaste and gels) [8].

A Brazilian study indicated that most dentists stated an approximate frequency (30–60%) of patients with DHS in their clinical routine. The most commonly reported (91.79%) cause of DHS was air blast or scraping with a probe. The first-choice approach by their subjects to handle DHS was a dentine desensitizer. Their results suggested that guidelines should be established to distribute the available knowledge concerning this condition in ways that may affect decision-making methods among dentists [9].

A similar investigation in India reported that the first modality of treatment stated by the dentists was the use of desensitizing toothpaste (72%), followed by patient education (19%) and restoration (8%). Concerning the recent innovations in this field, there was a lack of knowledge among the dentists. Barely 2% of them cited the use of remineralizing desensitizers, such as Teethmate, as a useful treatment option [10].

A Romanian-based investigation among dental students and young dentists revealed that most subjects showed good knowledge regarding pain characterization, causing factors, predisposing factors of dentin hypersensitivity, and an adequate level for the disease management approaches. They also reported that young dentists had superior knowledge of DHS compared to 6th-year dental students. There is a need to provide better theoretical and clinical teaching prospects to students and continued educational programs to students and young doctors [11].

Aims of the study

- To evaluate the knowledge of undergraduate dental students and general dental practitioners about the treatment of dentine hypersensitivity
- To compare the knowledge based on dental qualification and gender.

MATERIALS AND METHODS

Study design: This cross-sectional study was carried out using an online survey of dental students and general practitioners in Riyadh.

Study sample: Dental universities and hospitals in Riyadh were contacted, and participants were requested to fill up the survey. Using convenient sampling, one thousand participants, including 500 students and 500 dentists, were involved in the current research.

Study instrument: An online questionnaire consisted of questions about demographic and personal data, followed by questions about dentine hypersensitivity patients' exposure, symptoms, treatment, and prevention.

Instrument reliability and validity: A pilot study was carried out by sending the survey to 20 participants. The data will be inserted in SPSS version 22 to evaluate the reliability using Cronbach's coefficient alpha (value: 0.702). The validity of the questionnaire was evaluated by sending it to experienced researchers in REU, and changes were made based their comments and feedback.

Statistical analysis: The gathered data were analyzed using SPSS version 22, where inferential and descriptive statistics were conducted. Comparisons between groups were made with the value of significance kept under 0.05 using the Chi-square test.

RESULTS AND DISCUSSION

Table 1 shows the power of the sample, which was calculated to be 0.96, therefore showing very good power. **Figure 1** shows the gender ratio, where 47% males and 53% females participated in this study. As far as their qualification was concerned, 49% were general practitioners, and 51% were dental students (**Figure 2**).

Table 2 shows the survey questions with their overall responses, which revealed that 67.9% had examined at least one patient with DHS during the past six months, 14.7% reported that more than 40 patients visit every six months with DHS, 69.5% believed DHS has a major impact on the quality of life, the gingival recession was believed to be the most common cause of DHS (23%), history of hypersensitivity was considered to be the most common method of diagnosing DHS, only 19.1% were extremely confident in correctly diagnosing DHS, and 56.1% said they required more information on this topic.

Tables 3 and 4 list down the survey questions having statistically significant association (or not) with gender and qualification, respectively. Overall, the association of gender with survey questions was not significant, with only 6 of our 17 variables being statistically significant (p -value < 0.05). However, when comparing the responses based on qualification, we observed 8 variables out of 16 having statistically significant associations (p -value < 0.05).

Power of sample

Table 1. Power of sample

Mean	1.84
Std. Deviation	0.65
Sample size	1000
Alpha	0.05
Sample mean	1.91
Standard Error of Mean	0.02
Critical Value	1.87
Beta	0.04
Power	0.96

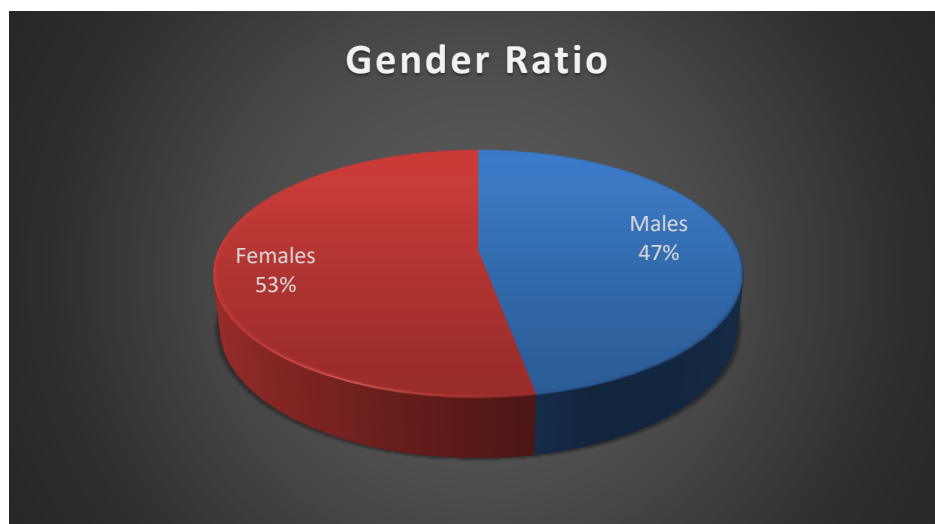


Figure 1. Gender ratio of study participants

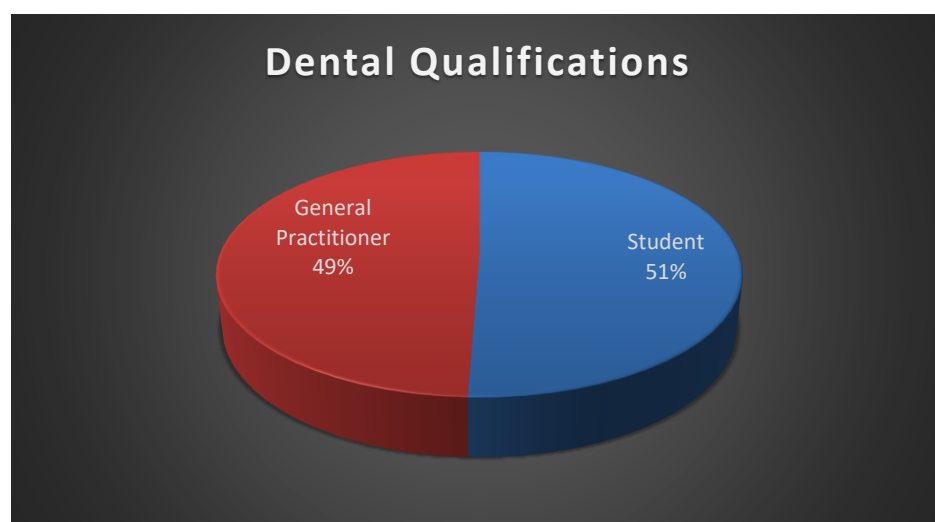


Figure 2. Dental qualifications of study participants

Table 2. Survey questions with their overall responses

Survey Questions	Responses (%)
Did you examine a patient with DHS within the past 6 months?	Yes: 67.9% No: 32.1%
Estimated percentage of patients visiting your hospital with DHS	0 to 20%: 30.4% 21 to 40%: 54.8% more than 40%: 14.7%
Did you observe the signs associated with DHS in your patient?	Yes: 63.9% No: 36.1%
Do you consider DHS a serious problem?	Yes: 43.1% No: 41.1% Don't know: 15.8%
DHS has major impact on quality of life?	Yes: 69.5% No: 30.5%
If yes, how much is the impact?	Mild to moderate: 57.8% Moderate to severe: 42.2%
Which is the most common cause of DHS in your opinion?	Exposed Dentine: 18% Gingival Recession: 23% Abrasion: 7% Fluid Movement: 12% Loss of Enamel: 8% Wrong brushing: 6% Periodontal Disease: 7% Enamel Fracture: 6% Erosion: 2% Attrition: 2% Bleaching: 3% Periodontal Tx (post-op. sensitivity): 2% Leaking Restoration: 2% Caries: 1%
What steps would you take to clinically diagnose a patient with dentine hypersensitivity	Clinical Sensitivity to Cold: 16% Clinical Examination: 18% Dentine Hypersensitivity History: 21% Vitality Test: 14% Aggravating factor: 11% Eliminate the cause of DHS: 6% Assess Recession: 4% take a radiograph: 4% Med History: 1% Diet History: 1%
What other dental conditions would you consider when making a diagnosis of DH?	Cracked Tooth Syndrome: 13% Fractured restoration: 13% Chipped teeth: 15% Dental Caries: 24% Post-operative sensitivity: 13% Marginal Leakage: 8% Pulpitis: 6% Palatogingival groove: 5% Bleaching Sensitivity: 5% Attrition 4%
How confident you are in correctly diagnosing dentine hypersensitivity rather than other dental conditions that result in pain	Not confident at all: 10.9% somewhat confident: 34.8% confident: 35.3% extremely confident: 19.1%
In your opinion, which is the most currently accepted theory of DHS?	Neural theory: 16.3% Transduction theory: 36.3% Hydrodynamic theory: 39.5% Other: 7.9%
How do you assess/evaluate patients complaining of dentine hypersensitivity in the surgery environment?	Self-evaluation: 18.3% Dental exam: 32.1% Measurement of recession: 24.6% Thermal test: 17.2% Diet analysis: 7.8%
advice recommended to patients experiencing DH	Home desensitizing dentifrice: 17.2% Education on toothbrushing: 25% In-office application of a desensitizing agent: 30.1% Restorative treatment: 19.9% Other options: 6.8%
how confident you are when suggesting proper at-home materials to patients experiencing dentine hypersensitivity	Not confident at all: 17% somewhat confident: 44.8% confident: 26.1%

	extremely confident: 12.2%
Did your patients have non-dental problems (such as stress etc.) in their daily life which may contribute to DH	Yes: 37.1% No: 41.1% Not sure: 21.8%
Patients frequently complied with the professional advice provided for the treatment and management of DH?	Yes: 69.4% No: 30.6%
There is a need for additional information to prevent further occurrences of DH in the form of a leaflet etc.	Yes: 56.1% No: 31.8% Maybe: 12.1%

Table 3. Survey responses comparisons based on gender

Survey Questions	Males	Females	P		
Did you examine a patient with DHS within the past 6 months?	No statistically significant association		.686		
Estimated percentage of patients visiting your hospital with DHS	No statistically significant association		.998		
Did you observe the signs associated with DHS in your patient?	No statistically significant association		.101		
Do you consider DHS a serious problem?	No statistically significant association		.211		
DHS has a major impact on quality of life?	No statistically significant association		.253		
If yes, how much is the impact?	No statistically significant association		.683		
Which is the most common cause of DHS, in your opinion?	No statistically significant association		.885		
What steps would you take to diagnose a patient with dentine hypersensitivity clinically	No statistically significant association		.347		
What other dental conditions would you take into consideration when making a diagnosis of DH?	Cracked Tooth Syndrome: 13% Fractured restoration: 12% Chipped teeth: 15% Dental Caries: 20% Post-operative sensitivity: 9%	Marginal Leakage: 9% Pulpitis: 5% Palatogingival groove: 5% Bleaching Sensitivity: 5% Attrition 4%	Cracked Tooth Syndrome: 11% Fractured restoration: 12% Chipped teeth: 14% Dental Caries: 24% Post-operative sensitivity: 16%	Marginal Leakage: 6% Pulpitis: 4% Palatogingival groove: 5% Bleaching Sensitivity: 4% Attrition 2%	.047
How confident you are in correctly diagnosing dentine hypersensitivity rather than other dental conditions that result in pain	No statistically significant association		.476		

In your opinion, which is the most currently accepted theory of DHS?	Neural theory: 18% Transduction theory: 36% Hydrodynamic theory: 35% Other: 11%	Neural theory: 15% Transduction theory: 36% Hydrodynamic theory: 44% Other: 5%	.000
How do you assess/evaluate patients complaining of dentine hypersensitivity in the surgery environment?	Self-evaluation: 23% Dental exam: 27% Measurement of recession: 25% Thermal test: 5% Diet analysis: 9%	Self-evaluation: 14% Dental exam: 36% Measurement of recession: 24% Thermal test: 19% Diet analysis: 6%	.000
advice recommended to patients experiencing DH	No statistically significant association		.705
how confident you are when suggesting proper at-home materials to patients with dentine hypersensitivity	Not confident at all: 22% somewhat confident: 39% confident: 25% extremely confident: 14%	Not confident at all: 13% somewhat confident: 50% confident: 27% extremely confident: 11%	.000
Did your patients have non-dental problems (such as stress etc.) in their daily life which may contribute to DH	Yes: 32% No: 44% Not sure: 25%	Yes: 42% No: 39% Not sure: 19%	.003
Patients frequently complied with the professional advice provided for the treatment and management of DH?	No statistically significant association		.682
There is a need for additional information to inhibit further occurrences of DH in the form of a leaflet etc.	Yes: 60% No: 28% Maybe: 12%	Yes: 53% No: 35% Maybe: 12%	.037

Table 4. Survey responses comparisons based on qualification

Survey Questions	Dental Student	General Practitioner	P
Did you examine a patient with DHS within the past 6 months?	No statistically significant association		.744
Estimated percentage of patients visiting your hospital with DHS	No statistically significant association		.902
Did you observe the signs associated with DHS in your patient?	Yes: 60% No: 40%	Yes: 68% No: 32%	.016
Do you consider DHS as a serious problem?	Yes: 38% No: 44% Don't know: 18%	Yes: 48% No: 39% Don't know: 14%	.008
DHS has major impact on quality of life?	No statistically significant association		.084
If yes, how much is the impact?	No statistically significant association		.191

Which is the most common cause of DHS in your opinion?	Exposed Dentine: 21% Gingival Recession: 23% Abrasion: 10% Fluid Movement: 11% Loss of Enamel: 8% Wrong brushing: 5% Periodontal Disease: %	Enamel Fracture: 6% Erosion: 2% Attrition: 2% Bleaching: 3% Periodontal Tx (post-op. sensitivity): 2% Leaking Restoration: 2% Caries: 1%	Exposed Dentine: 16% Gingival Recession: 24% Abrasion: 4% Fluid Movement: 13% Loss of Enamel: 7% Wrong brushing: 7% Periodontal Disease: 9%	Enamel Fracture: 5% Erosion: 1% Attrition: 1% Bleaching: 4% Periodontal Tx (post-op. sensitivity): 2% Leaking Restoration: 3% Caries: 1%	.000
What steps would you take to clinically diagnose a patient with dentine hypersensitivity	No statistically significant association			.105	
What other dental conditions would you consider when diagnosing DH?	No statistically significant association			.057	
How confident you are in correctly diagnosing dentine hypersensitivity rather than other dental conditions that create pain	Not confident at all: 13% somewhat confident: 31% confident: 36% extremely confident: 19%	Not confident at all: 8% somewhat confident: 38% confident: 35% extremely confident: 19%			.019
In your opinion, which is the most currently accepted theory of DHS?	Neural theory: 20% Transduction theory: 37% Hydrodynamic theory: 36% Other: 7%	Neural theory: 13% Transduction theory: 36% Hydrodynamic theory: 43% Other: 8%			.024
How do you assess/evaluate patients complaining of dentine hypersensitivity in the surgery environment?	No statistically significant association			.055	
advice recommended to patients experiencing DH	Home desensitizing dentifrice: 16% Education on toothbrushing: 27% In-office application of a desensitizing agent: 28% Restorative treatment: 19% Other options: 10%	Home desensitizing dentifrice: 18% Education on toothbrushing: 25% In-office application of a desensitizing agent: 32% Restorative treatment: 21% Other options: 4%			.007
how confident you are when recommending appropriate at-home materials to patients experiencing dentine hypersensitivity	Not confident at all: 21% somewhat confident: 42% confident: 27% extremely confident: 11%	Not confident at all: 13% somewhat confident: 48% confident: 26% extremely confident: 13%			.015
Did your patients have non-dental problems (such as stress etc.) in their daily life which may contribute to DH	Yes: 33% No: 44% Not sure: 24%	Yes: 41% No: 39% Not sure: 20%			.018

patients frequently complied with the professional advice provided for the management and treatment of DH?	No statistically significant association	.097
There is a necessity for extra information to hinder further occurrences of DH in the form of a leaflet etc.	No statistically significant association	.134

The aim of the present research was to assess the experiences and confidence levels of dental students and general practitioners when it comes to the detection and management of dentine hypersensitivity (DHS). A similar study conducted in the United Kingdom revealed that 18.9% of dentists considered the DHS a significant problem whereas 32.5% of students hesitated about this. 66% of the general practitioners and 62.5% of dental students believed that having DHS poses a threat to the overall quality of life, and these differences were statistically significant [12]. When comparing their findings with our results, it was noted that 48% general practitioners thought the DHS was a serious problem, which is very high compared to the study mentioned above, and 18% of students were not sure about it, which is very low comparably. Regarding DHS posing a threat to the quality of life, no statistically significant association was seen between dental students and general practitioners.

Another Nigerian-based study among general dental practitioners reported that gingival recession was the most commonly stated predisposing factor behind DHS among patients, with medications being the least common risk factor presented by the participants [13]. When comparing these findings with our study, it was observed that gingival recession was the most common cause mentioned by our participants, which is similar to the Nigerian research. Regarding the least common factor, caries were stated by our study participants, which is different from what the Nigerian study reported.

Another study was conducted among the students and general practitioners of Romania, which revealed a statistically significant difference between these sub-groups when assessed the variables such as triggering factors, predisposing factors, and treatment strategies regarding the DHS. Dental practitioners exhibited better knowledge and attitudes towards the diagnosis and treatment of the DHS than dental students [11]. When comparing these findings with our results, it was noticed that there was a statistically significant difference between dental students and general practitioners regarding the predisposing factors, and general practitioners showed better knowledge, which is similar to the Romanian study. Moreover, the confidence level of general practitioners was also higher than the students.

Limitations of this study include that survey studies are sometimes associated with participants being uncomfortable in providing answers that unfavorably present themselves. Moreover, the study subjects may not have full knowledge about the reasons for any given answer due to lack of memory on the subject or even boredom.

CONCLUSION

- Overall, the participants have shown satisfactory knowledge and confidence in diagnosing and treating the DHS.
- General practitioners seem to be much more knowledgeable and confident as compared to dental students.
- Although there was no overall significant difference between males and females, females showed slightly better attitudes and confidence levels than males.
- There is a need to increase educational material regarding the DHS at undergraduate levels to improve their knowledge and confidence levels.

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ETHICS STATEMENT : None

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