



## A Survey of the Professional Opinions of Kuwaiti Dentists for the Treatment and Management of Dentine Hypersensitivity: A Questionnaire-based Study

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### Abstract

**Background:** Dentine hypersensitivity (DH) is a common problem encountered in clinical practice. The aim of this study was to evaluate the professional opinions and understanding of Kuwaiti Dentists for both the treatment and management of DH and to assess the prevalence, advice and treatments and their efficiency offered by the dentist to patients experiencing DH.

**Material and Methods:** A 26-item questionnaire was sent to a representative sample of Kuwaiti Dentists of 318 Kuwaiti dentists who were randomly selected using the Kuwait Dental Association membership list and invited to participate in a questionnaire-based survey. The questionnaires were distributed in both hard and soft copy formats through individual web links.

**Results:** 318 questionnaires were distributed with 190 (59.7%) qualified Kuwaiti dentists [Male: 151, Female: 36, 3 unidentified;  $32.99 \pm 5.5$  years of age], completing the questionnaire. Most dentists indicated that up to 25% of their patients reported DH with 10% of patients experiencing discomfort from DH which in some cases lasted up to three weeks. Most participants (66%; n= 100) indicated that the effect of DH on the QoL of their patients was moderate in nature with 51.9% (n=84) indicating that tooth brushing had a major impact on the QoL. 'Gingival recession' and 'periodontal disease' were considered to be implicated as predisposing or aetiological factors of DH. Most dentists indicated that they were confident in recommending OTC products for home use.

**Conclusions:** In conclusion, the present study reported that the perceived prevalence of DH by Kuwaiti dentists was rel-

atively lower than previously reported studies. Overall, the perception of most of the participating Kuwaiti dentists on the aetiology, diagnosis and management of DH, was generally consistent with the current scientific consensus on DH, although there was still confusion concerning some of the aspects of the diagnosis and management of the condition.

**Keywords:** Dentine Hypersensitivity; Questionnaire; Management; Professional Opinion

## Introduction

Dentine Hypersensitivity (DH) is a recognized clinical condition that may have a profound impact on the Quality of life (QoL) of those who suffered from the problem [1]. Questionnaire studies that report on the prevalence of DH from the patient's perspective indicate a prevalence of up to 57% [2-5] whereas questionnaire studies determining the dentists' (General Dental Practitioners' [GDP]) perspective record prevalence values between 10% to 25% [6, 7-9]. This clearly illustrates a fundamental difference between the perception of DH from both the dentist and patient outlook, which may have an impact on whether the condition is reported by the patient or treated by the dentist.

Previous questionnaire studies have also indicated that Dentists may be uncertain about the aetiology, diagnosis and effective management of Dentine Sensitivity/ Dentine Hypersensitivity [DH] [10-17]. Furthermore; it was also evident that routine clinical screening for DH was not conducted by dental professionals, except when prompted by patients who were experiencing pain from the condition [10]. According to Gillam [16] there are numerous outstanding issues that need to be resolved when evaluating the management of DH such as whether the condition is effectively identified, managed and monitored by dentists in their dental practices. The aim of the present study was to evaluate the professional opinions and understanding of Kuwaiti Dentists for the treatment and management of DH.

## Aims & Objectives

To evaluate the professional opinions and understanding of Kuwaiti Dentists for the treatment and management of DH, and to determine whether:

1) Screening for DH was routinely conducted by the dentist.

2) The dentists considered a differential diagnosis prior to treatment.

3) The dentists identified erosion as the primary cause of DH.

4) The dentists identified the hydrodynamic theory as the accepted theory of DH.

5) Dentists were confident in managing their patients' pain.

## Methodology

A cross-sectional self-administered questionnaire was distributed in two phases namely: 1) Pilot Study and 2) Main Study.

The questionnaire design was based on previously reported global reports relating to DH that included its prevalence, the important predisposing factors, the major triggers, mechanisms, differential diagnosis, patient management, dentist management and continuing education about the condition.

The questionnaire design consisted of 26 questions including both multiple choice questions and open-ended questions. The first section the demographic characteristics of the participating dentists including age, gender, year of graduation, work status and practice type.

The questions of the questionnaire focused on the dentist's perspective of patients presenting with DH and its causes, triggers and predisposing factors as well as diagnosis and management.

The participants were randomly selected using the Kuwait Dental Association membership list and randomly selecting about 300-350 generated numbers from them through the website (www.random.org). The questionnaires were distributed to randomly selected dentists practicing in Kuwait. There were 318 dentists from a total population of 1802 Kuwaiti dentists, which represents approximately 17.7% of the dentist population.

## Results

### Pilot Phase

Forty-nine questionnaires (both, hard and soft copies) were distributed to Kuwaiti dentists in April 2016 by Naser Dashti (ND) and collected during the months of No-

vember and December 2017.

## Main Study

269 questionnaires were distributed to Kuwaiti Dentists in a soft copy format through either by mobile phone messages (text) and emails using a Survey Monkey link (www.SurveyMonkey.com) or a Whatsapp Application. The completed questionnaires were collected during the period between September 2018 and March 2019.

## Inclusion Criteria

All qualified dental professionals in Kuwait who were willing to give their consent participated in the study.

**Exclusion Criteria:** Non-qualified Dentists and Students.

## Data Analysis

The data from the questionnaires was entered into a SPSS database version 29 (SPSS, IBM, Portsmouth, UK), analyzed and presented in the form of tables and frequency distributions.

Ethical Approval for the study was granted by Queen Mary University London (QMUL) Ethics Committee on the 21<sup>st</sup> March 2016 (QMREC 1688).

## Pilot Study

49 questionnaires were distributed as part of the pilot study and collected on two separate occasions during the period from April 2016 to May 2016, when 35 hard copies of the questionnaires were distributed by hand (ND) in Kuwait with 33 questionnaires (94.2%) collected at this time. On the second occasion, 15 questionnaires were distributed via mobile phone messages, with 10 responses (66.6%) collected. These questionnaires were distributed through a web link to the randomly selected Kuwaiti dentists between November 2017 and December 2017. Forty-three questionnaires (87.7%) were completed and returned to the investigator at this time. No changes were required following the analysis of the questionnaire used in the pilot study.

## Main Study

The main study was conducted during the period September 2018 to March 2019. Only soft copies were dis-

tributed as it was decided following the results from the pilot study that this was the more effective way to obtain the most responses from dentists in Kuwait. 269 individual web links were sent through (40 out of 269 via emails and 229 out of 269 via mobile phone messages).147 (54.6%) out of 269 questionnaires were completed and included in the study.

The results from the pilot study were combined with those results from the main study to include 318 participants. 190 Kuwaiti dentists (59.7%) participated in the study with the data was inputted into a password-protected PC, using SPSS software (v. 29) and subsequently analyzed.

The demographic data collected from the participants is presented in Table 1. The questionnaire was completed by 151 (79.5%) males, 36 (18.9) females with three (1.6%) unidentified. The mean age average was 32.99 ± 5.5 years of age. The GDPs were [(55.3%), n=105], the post-graduate students were [(3.7%), n=7], the specialists' practices were [(39.4%), n=75] and three (1.6%) were unknown. From the participants considered, most of them had experience between six to ten years [(38.9%), n=74].

**Table 1:** Demographic Data of the Study Population.

Variables		Data
Sex	Male	151 (79.5%)
	Female	36 (18.9%)
	Missing Value	3 (1.6%)
Age		32.99 ± 5.5 years (mean)
General or specialist practice	Dentist GDP	105 (55.3%)
	Post-graduate student	7 (3.7%)
	Specialist Practice	75 (39.4%)
	Missing Values	3 (1.6%)
	Post-graduate student	10 (5.3%)

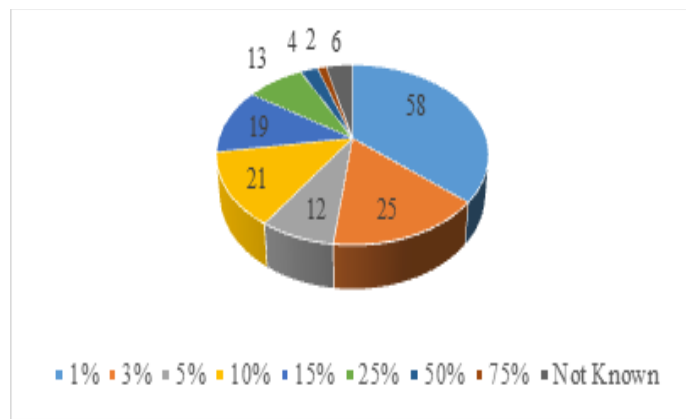
	≤ 5 years	46 (24.3%)
Experience	6-10 years	74 (38.9%)
	11-20 years	36 (19%)
	20 < years	2 (1%)
	Missing Value	22 (11.6%)
	≤499	25 (13.2%)
	500	7 (3.7%)
Patients per Practice	1000	10 (5.3%)
	1500	5 (2.6%)
	2000	6 (3.2%)
	>2500	52 (27.4%)
	Not known	51 (26.8)
	Missing Value	34 (17.9)

According to these results, the first part of the questionnaire included three areas with particular reference to the prevalence of DH in Kuwait:

- 1) The percentage of patients reporting the problem of DH.
- 2) The regularity of patients visiting the practice with DH as the chief complaint.
- 3) The frequency of patients asking questions about DH.

Most participants had more than 2500 patients in their practice or in a hospital setting [(27.4%), n=52] (Q1).

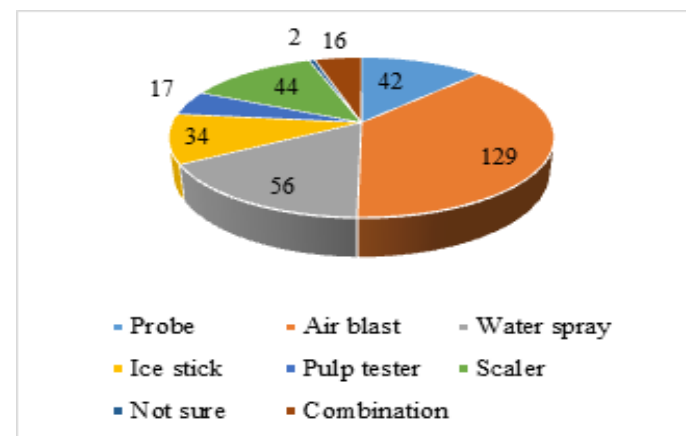
129 (82.2%) of the participants stated that they examined patients with DH during the fortnight prior to attending their practice (Q2). 58 (30.5%) of the participants reporting that only 1% of their patients complained of DH. 72.5% (n=116) of the participants stated that the prevalence of DH was up to 10% with 84.4% (n=135) indicating that the prevalence of DH in their patients was up to 15% (Q3, Figure 1).



**Figure 1:** Reported prevalence of DH (n=160; 3 Missing Values).

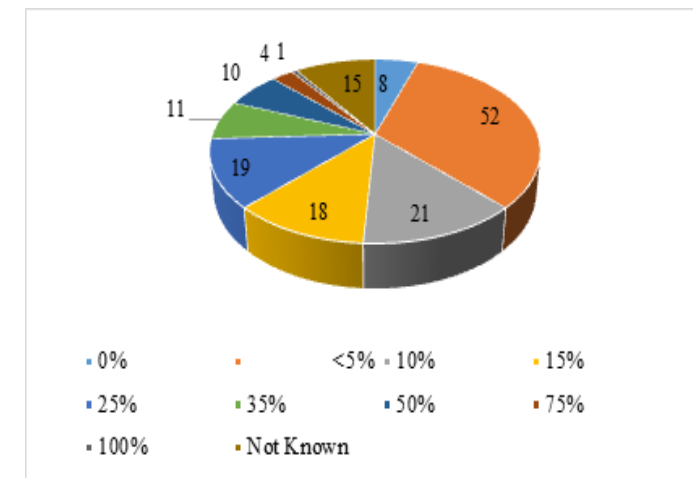
90 participants (61.6%) indicated that their patients usually initiated the conversation about DH prior to a diagnosis (Q4), and in patients who did not initiate the conversation, 58 (48.7%) of the dentists tried to initiate the conversation (Q5).

Most of the participants [(65.4%), n=104] stated that the clinical signs of DH were commonly observed during the clinical examination. Most of them [(75.9%), n=129] said that air blast (Air syringe) was more likely to elicit a response from the patient when testing for DH (Q6, Figure 2).



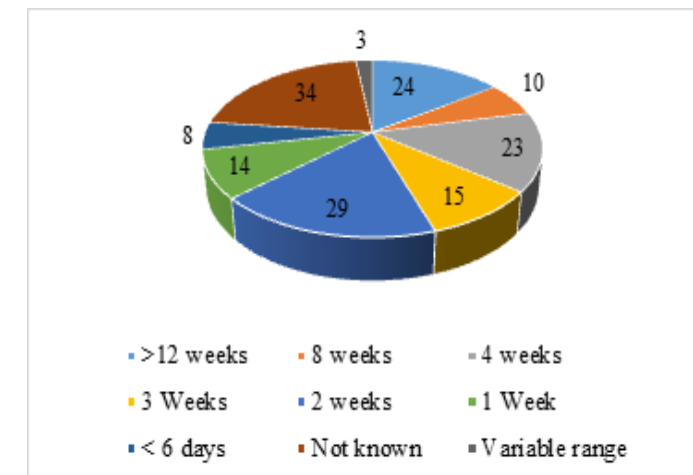
**Figure 2:** Diagnostic Techniques that were more likely to elicit a response from the patient when testing for DH (n=163 participant responses).

Fifty-two (32.7%) respondents noted that DH was a serious problem in less than 5% of the patients (Q7, Figure 3).



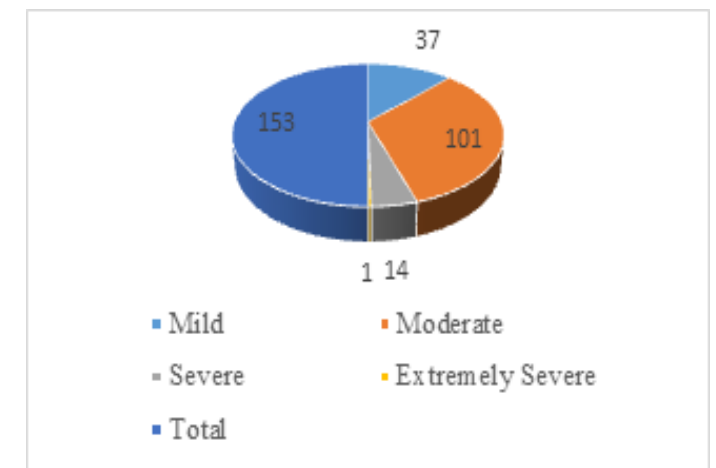
**Figure 3:** Participant Responses considering DH as a serious problem in their patients (n=160; 4 missing values).

Most of the participants (85%; n=136) indicated that DH lasted up to 8 weeks with 29 participants (18.1%) reporting that their patients felt discomfort for about two weeks. 15% (n=24) indicated that DH lasted >12 weeks (Q8, Figure 4).



**Figure 4:** Duration of discomfort patient's complaint (n=163; 3 missing values).

For Q 9, most of the participants [(74.5%), n=120] stated that DH affected the quality of life (QoL) of their patients with 101 (66%) participants considering the impact of DH on QoL to be moderate in nature (Q10, Figure 5).



**Figure 5:** Impact of DH on QoL (n=153; 10 Missing Values).

Based on the factors that affect the quality of life of a patient, tooth brushing technique [(51.9%), n=84] was reported to be the most activity affecting the QoL of patients together with professional activities such as teeth whitening procedures [(37%), n=60], scaling procedures [32.1%; n=52 and periodontal surgery [28.4%; n=46] (Q11, Figure 6).



**Figure 6:** Activities affecting the QoL of a patient (n= 163).

When asked about the frequency of questions from patients (Q12) the participants indicated that 71 (43.6%) of the participants stated that they were 'sometimes' asked about the condition with 62 (38%) indicating 'often' with 21 (12.9%) participants stating 'very often' and 9 (5.5%) participants were seldom' asked about DH.

Regarding the dentists' knowledge about DH that focused on their knowledge in relation to the aetiology, diagnostic methods and treatment options for the condition (Q13). The respondents indicated that gingival recession [n=70 (43.8%)] and periodontal disease [n=33 (20.5%)] were the main aetiology factors for DH (Table 2).

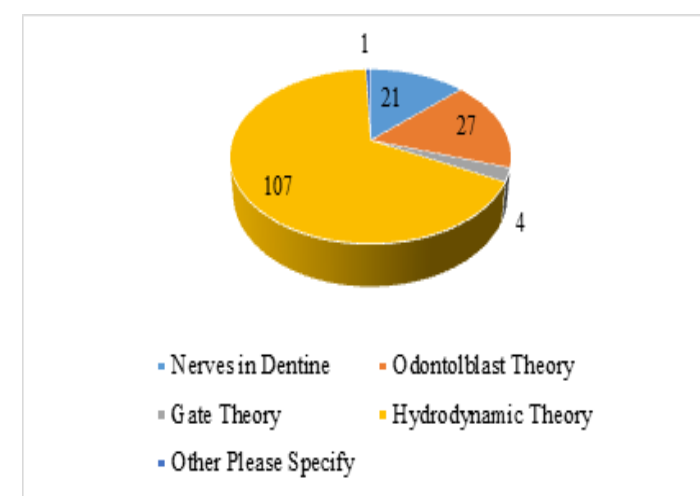
Most of the respondents reported using the Air blast syringe [(48.7%), n=73], doing clinical examination [(42%), n=63] and taking dental history [(31.3%), n=47] as an important diagnosis aid for the detection of DH (Table 2).

**Table 2:** Aetiological Factors and Diagnostic Aids in identifying DH.

No.	Variables	Data (n)
	Tooth Wear	16
	Exposed Dentine	10
	Gingival Recession	70
	Tooth Surface Erosion	19
	Bleaching Sensitivity	10
	Attrition	3
	Abrasion	17
	Fractured Restoration	8
	Periodontal Disease	33
	Poor OH Education	5
1	<i>Aetiology of DH</i>	
	Abfraction	1
	Post-Op Sensitivity	8
	Acid Drinks	3
	Cracked Tooth	10
	Dental Caries	8
	Leakage Marginal	5
	Pulpitis	4
	Chipped Tooth	4

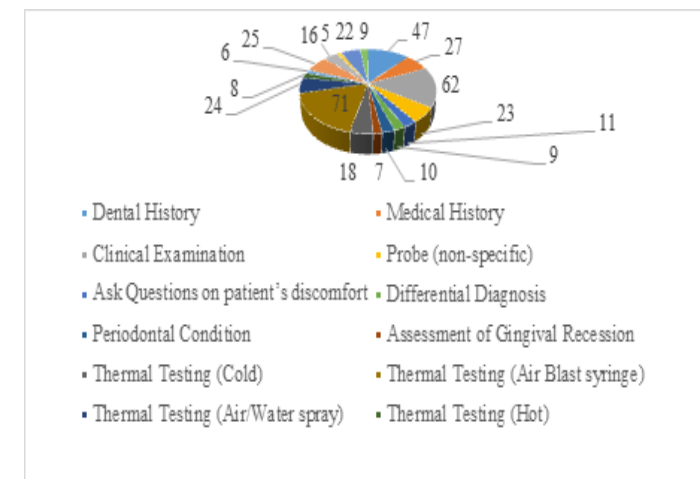
		Tooth Brushing Habits	25
		Dental History	47
		Medical History	27
		Asking Questions	11
		Clinical Examination	63
		Assess Recession	7
		Vitality Test	25
2	<i>Diagnostic aids</i>	Periodontal Condition	7
		Radiograph	16
		Hot Test	6
		Cold Test	23
		Probe	26
		Air Water Spray	25
		Air Blast Syringe	73
		OH Technique History	1
		Drying Teeth	4
		Diet History	5
		Differential Diagnosis	8
		Other	5

Most participants were aware of the current theory and mechanism underpinning DH (Q14). For example, 107 (66.9%) participants stated that the "Hydrodynamic Theory" was the most accepted hypothesis for initiating DH. 27 (16.9%) participants identified the "Odontoblast Theory" with 21 (13.1%) participants for the "Nerves in Dentine" and four (2.5%) for the "Gate Theory" respectively (Figure 7).



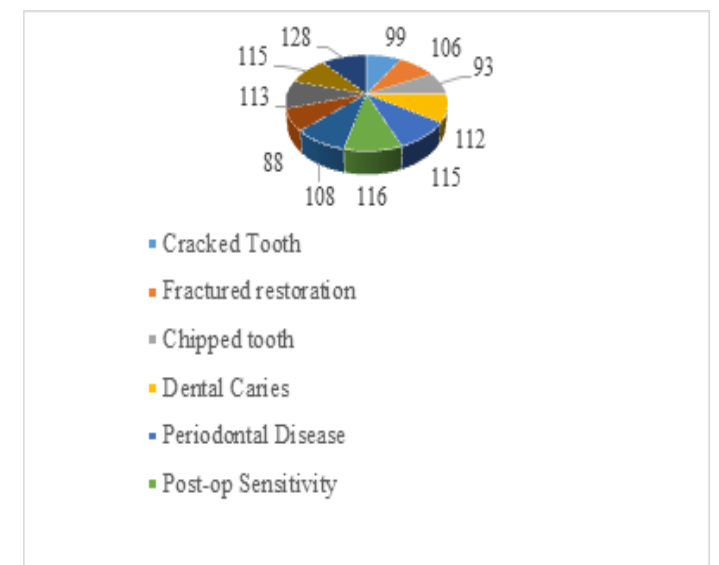
**Figure 7:** Name the currently accepted theory to explain how DH is initiated (n=160; 3 Missing Values).

When the participants were asked to outline the steps they would take to make their diagnosis of DH, most of the responses related to how they would identify the condition (Q15). For example, obtaining a dental (32%; n=47) and medical history (18.4%; n=27) from the patient, prior to a clinical examination (42.2%; n=62), as well as conducting a series of clinical assessments such as probing (non-specific)(5.6; n=23), thermal testing (Cold)(12.3%; n=18), thermal testing (Air Blast syringe)(48.3%, n=71), thermal testing (Air/Water spray)(16.3%, n=24), thermal testing (Hot) (5.5%. n=8) and pulp vitality (17%; n=25). A combination of assessment methods was also recorded (13.8%; n=22) as well as a radiographic evaluation (10.9%; n=16) (Figure 8).



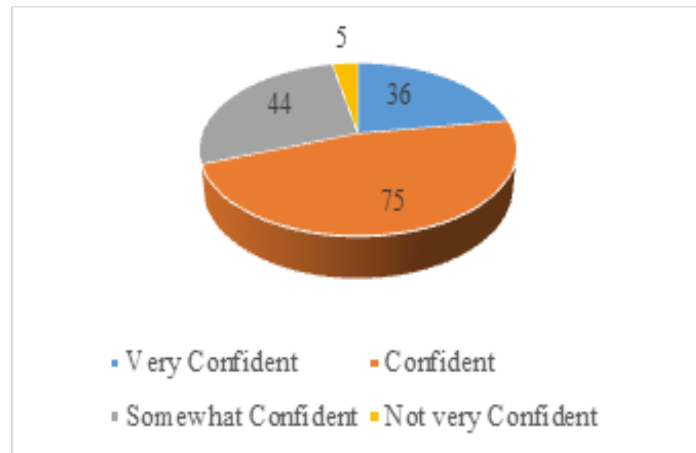
**Figure 8:** What steps would you take to diagnose the patient with dentine hypersensitivity ?

Q16 required the participants to indicate which dental conditions would have to be eliminated when making a diagnosis of DH. Of the responses (excluding missing values) the following dental conditions to be eliminated prior to making a diagnosis of DH were identified namely: gingival recession as a result of periodontal disease or treatment [(81.5%), n=128], post-operative sensitivity [(73.4%), n=116], periodontal disease [(72.8%), n=115], bleaching sensitivity [(71.4%), n=115], tooth surface loss [(71.5%), n=113], dental caries [(70.9%), n=112], marginal leakage [(68.4%), n=108], fractured restorations [(67%), n=106], cracked tooth syndrome [(62.7%), n=99], chipped teeth [(58.9%), n=93], pulpitis [(55.7%), n=88] (Figure 9).



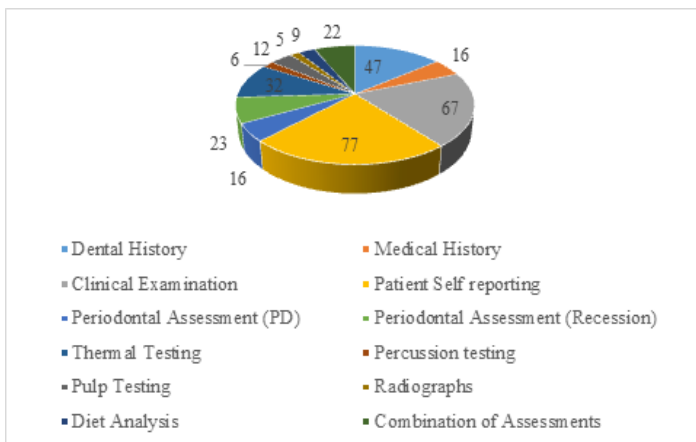
**Figure 9:** Which dental conditions would have to be eliminated when making a diagnosis of DH?

When asked how confident they were in diagnosing DH (Q17), 76 (47.2%) of the participants reported that they were "confident" in their diagnosis of DH, whereas 44 (27.3%) responded that they were "somewhat confident"; 36 (22.4%) were "very confident" and only five (3.1%) reported that they were "not very confident" in diagnosing DH (Q17; Figure 10).



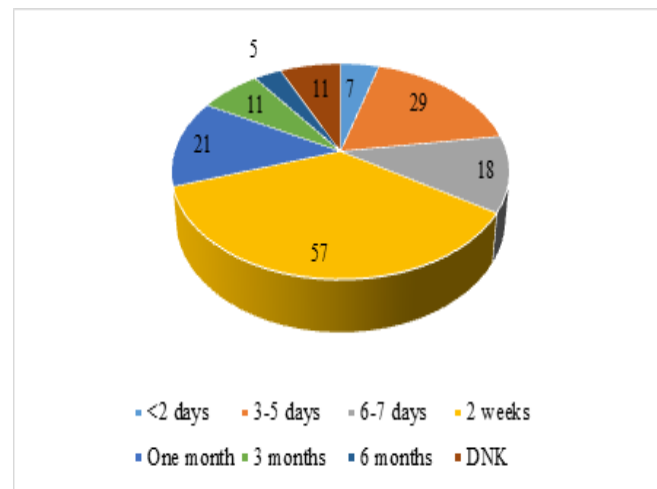
**Figure 10:** Confidence in diagnosing DH from other Clinical Conditions (n=160; missing value =3).

When asked how they would assess patients complaining of DH in their dental practice (Q18). Most of the participants chose the following categories when for assessing the patient’s complaint in the dental practice environment by namely: 1) sensitivity self-reported by the patient [(48.1%), n=77], 2) dental examination [(41.9%), n=67], 3) thermal tests [(20%), n=32], 4) measurement of recession [(14.4%0, n= 23], 5) combination of assessments [(13.8%), n= 22], 6) medical history [(10%), n= 16], 7) probing depths [(10%), n=16], 8) pulpal testing [(7.5%), n=12], 9) diet analysis [(5.6%), n=9], 10) percussion tests [(3.8%), n=6] and 11) taking dental radiographs [(3.1%), n=5].

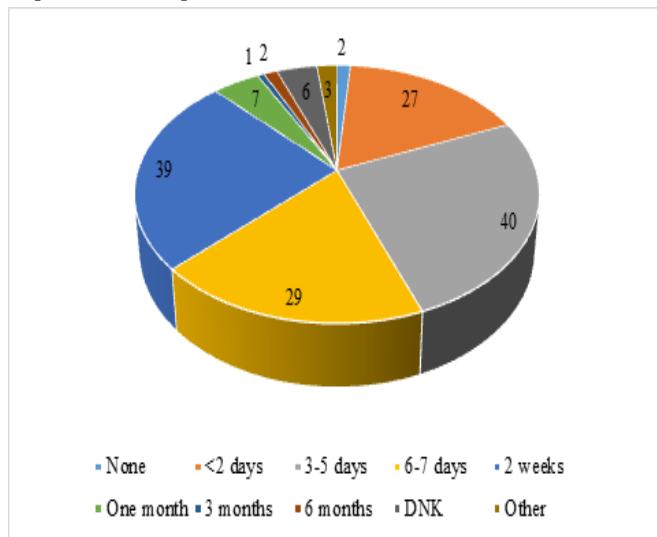


**Figure 11:** Assessment of patients complaining of DH in dental practice.

When asked about the duration of discomfort following non-surgical and surgical periodontal procedures (Q19-20), most of the respondents reported that they expected discomfort to continue for 3-5 days following non-surgical periodontal treatment [(25.6%), n=40] and two weeks following periodontal surgery [(35.6%), n=57] (Figures 12-13).



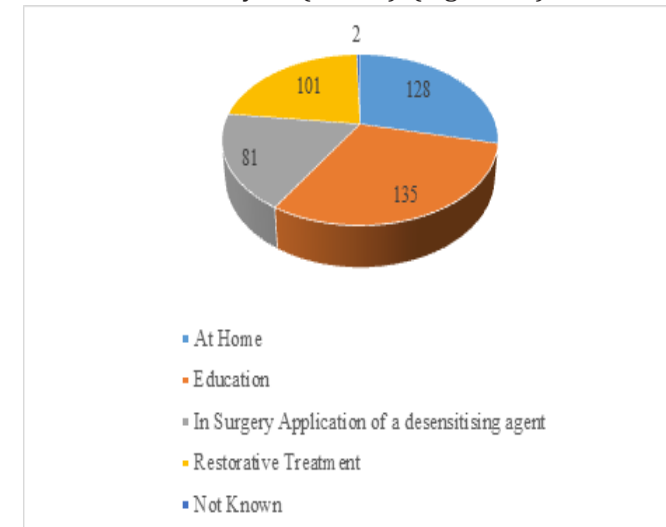
**Figure 12:** The duration of discomfort following non-surgical periodontal procedures.



**Figure 13:** The duration of discomfort following surgical periodontal procedures.

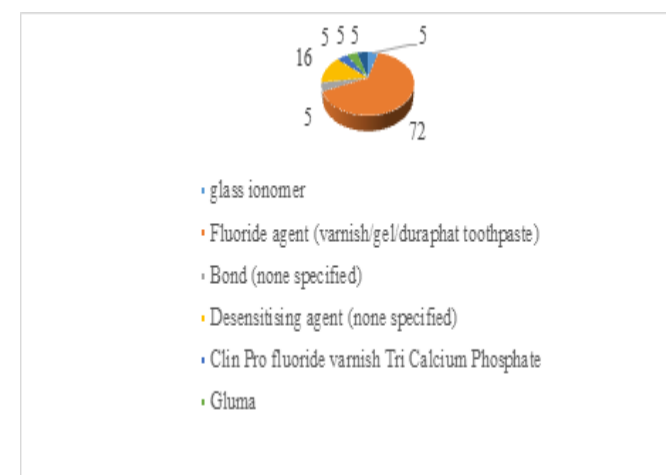
With regard to the suggested treatment options for treating DH (Q21), 135 (83.9%) of the participants opted

for using “Education on a correct non-destructive tooth brushing technique.” 101 (62.7%) selected a “Restorative treatment including surgical management” of the participants suggesting this option followed by “In-surgery application of an anti-sensitivity agent” [n=81 (50.3%)], and the least suggested option was “At-home use of a desensitizing dentifrice” with only 32 (30.5%) (Figure 14).



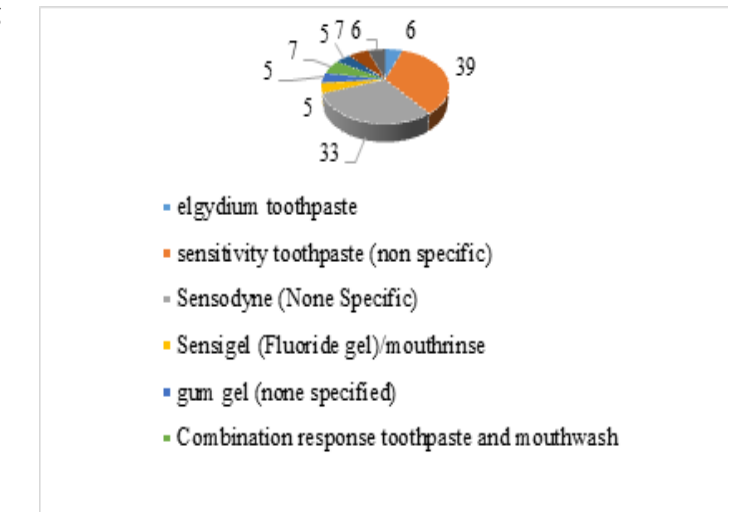
**Figure 14:** Treatment Options for Treating DH.

When asked which professionally applied products they would recommend (Q22) the participants mainly recommended 1) a Fluoride agent (Varnish/Gel/ Duraphat toothpaste) [(54.5%), n=72], and 2) non-specified desensitizing agent [(12.1%), n=16] for treating DH (Figure 15).



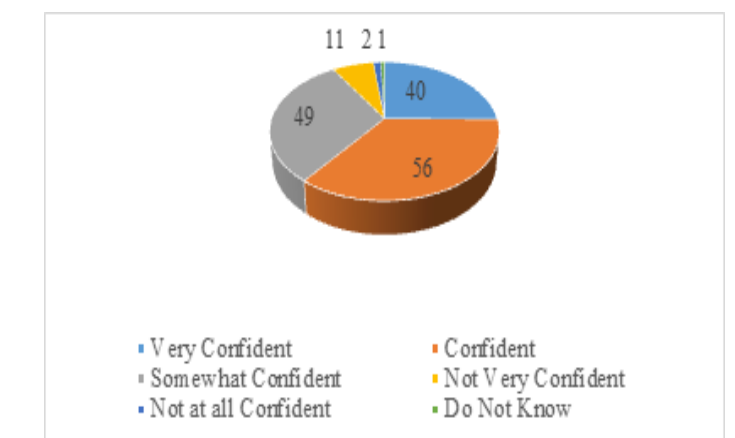
**Figure 15:** Recommended Professionally applied products when treating DH.

When asked which home use products they would recommend (Q22b) the participants mainly recommended the following products namely 1) a sensitivity toothpaste (non-specific) [(20.5%), n=39] and 2) Sensodyne toothpastes (non- specific) [(23.9%), n=33] (Q22b).



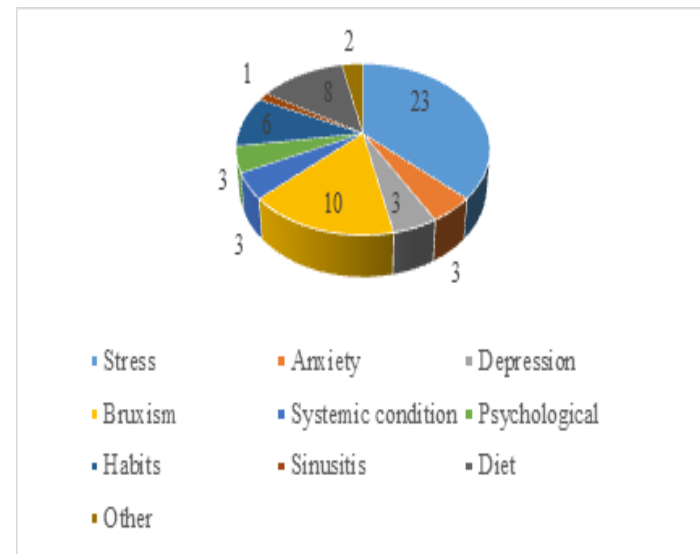
**Figure 16:** Recommended Home use products when treating DH.

When asked how confident they were in recommending appropriate home use products for patients experiencing DH (Q23) the participants indicated the following: 1) 35.2% (n=56) claimed to be “confident” 2) 30.8% (n=49) claimed to be “Somewhat confident”, 3) 25.2% (n=40) claimed to be “Very confident”, 4) 6.9% (n=11) claimed to be “Not very confident” and 5) 1.3% ( n=2) claimed that they were “Not very confident” (Figure 17).



**Figure 17:** Confidence in recommending Home use products for DH.

When asked whether patients complaining of DH may also have non-dental related problems in their daily life, which may contribute to the clinical problem (Q24) 28.1% (n=45) indicated "Yes" and 28.1% (n=45) indicated "No". 43.8% (n=70) indicated that they did "not know". Of those participants who indicated "Yes" 15.5% (n=23) indicated that the following conditions namely 1) Stress (15.5%; n=23), 2) Bruxism (6.8%; n=10), Dietary (5.4%; n=8) and 4) habits (non- specified) (4.1%; n=6) (Figure 18).



**Figure 18:** Non-Dental causes associated with DH.

When asked whether they considered that their patients complied with the professional advice regarding the treatment and management of DH (Q25), 56.3% (n=89) indicated that their patients did comply with their advice.

When asked about whether was a need to provide further information to patients in the form of leaflets etc., (Q26), 39.5% (n=62) of the participants indicated that there was a need to supply this information. Some of the participants (14.7%; n=24), however reported that there was still a need to recommend a patient leaflet/folder which would provide information about the condition and how to prevent DH from becoming a problem for the patient as well as providing a greater awareness of the problem (2.5%; n=4).

## Discussion

Previous studies or reviews have indicated that

Dentists may be uncertain about the aetiology, diagnosis and effective management of Dentine Sensitivity/Dentine Hypersensitivity [DH] [10, 16]. According to the 2003 Consensus Document on DH [10] there are several concerns relating to the effective diagnosis and management of the condition which may have an impact on the treatment of DHS. The questionnaire used in the present study was based on a previously validated questionnaire used in the United Kingdom relating to the understanding of DH [8, 12, 13] which been recently updated and used in several studies namely in Brazil and India [17, 15]. The response rate from the study was 59.7% which compares favourably with previous studies [6, 8, 10, 17].

The advantage of using a self-administered questionnaire in studies of this nature was that they are relatively easy to utilize and inexpensive to produce. The questionnaire survey was targeted at dentists and designed to capture personalized attitudes and opinions concerning the identification and the management of DH. There were no major problems with the responses from the dentists and as such, the questionnaire will remain the same for the main study. It was decided however that the questionnaires should be distributed by e-mail/webmail rather than through distribution by hand (hard copy). It was anticipated that the number of participants (dentists) in the study would improve using this method of distribution. The soft copies questionnaire showed a lower rate of participating in the study and a lower rate of completing page 2 answers as it opens in new page. They may have thought that the questionnaire is only one page (the demographic questions). However, a sample size of 10.5% of the population was considered adequate in evaluating the opinions of clinician practicing dentistry in Kuwait.

This was the first study conducted in Kuwait that has investigated Dentists' perceptions regarding DH, although the questionnaire has been validated in several previous studies [8, 12, 13]. The present study showed that most of the participants had some dental practice experience up to 10 years and had a patient base of at least 2500. Approximately 82.2% of the participants reported that they identified at least one patient with DH in a period of a fort-

night leading up to the day of examination in the hospital or their practice setting. The prevalence of DH reported in the present study was somewhat different to some of the previously reported prevalence figures and as such may either be relatively uncommon or underdiagnosed. Although these results were not in general agreement with other studies, where the prevalence of DH ranged from 1.3% to 57% [1, 2, 4, 18-21]. One of the problems when analyzing results of this nature was the location of where the dentists practiced such as private practice clinics/hospitals as well as general and specialist practice. A further problem may be the time involved in completing a questionnaire in a busy practice as well as accuracy of the data when recalling the number of patients examined over a specified time period.

74.2% (n=118) of the participants indicated that up to 25% of their patients considered a severe problem with DH with 37.7% (n=60) indicating that  $\leq 5\%$  of their patients considered DH a serious problem. These results appear to be reasonably consistent with previous studies using this questionnaire [6, 8, 12, 13]. Most of the participants stated that their patients frequently asked questions about the condition with 61.6% (n=90) of the participants indicated that their patients initiated the conversation on DH. In contrast 48.7% (n=58) of the participants indicated that they had initiated the relevant conversation which is reasonably consistent with the recent study by Pereira et al. [17]. Most of the participants indicated that their patients frequently asked questions about DH although there appears to be limited data in the literature to support this observation. 65.4% (n=104) of the participants claimed to have observed DH during their examination which would indicate over 30% failed or did not record that they had observed DH which could indicate that the condition was not treated. This figure was reasonably comparable with the results of the study by Pereira et al. [17] where approximately 79% of the participants observed DH.

41.3% (n=66) of the participants indicated that the duration of discomfort lasted for up to three weeks which was reasonably consistent with the recent study by Pereira et al. [17-21]. 74.8% (n=119) indicated that DH had an impact on their patients' Quality of Life [QoL] although most

participants (66%; n= 100) indicated that the effect of DH on the QoL of their patients was moderate in nature with 51.9% (n=84) indicating that tooth brushing had a major impact on the QoL. This observation appears to be at variance with previous studies where 'tooth brushing' was not considered to influence the individual's ability to brush their teeth without any discomfort as reported by Gillam et al. [22] where most of the patients were able to brush their teeth without any discomfort with only 8.7% of U.K. and 19.3% of Korean patients unable to do so. Most published studies indicate that 'cold' was the most frequently mentioned stimulus for DH [6, 22, 23].

66.9% (n=107) participants acknowledged that the "Hydrodynamic Theory was the underlying mechanism for DH which is also supported by previous studies [6, 17].

There was some concern regarding the participants choices of predisposing factors where 'Gingival recession' (43.8%; n=70) and 'periodontal disease' (20.6%; n=33) were considered by the participants to be implicated as a predisposing or aetiological factors of DH. This appears to be at variance with the previous results for the Canadian Consensus on DH where erosion was considered the primary cause of DH [10] Most of the respondents reported using the Air blast syringe during a clinical examination of their patients which was in accordance with previous studies [6, 8] When asked to outline the steps they would take to make their diagnosis of DH, most of the responses related to how they would identify the condition such as obtaining a dental and medical history from the patient, prior to a clinical examination, as well as conducting a range of clinical assessments which again was fairly consistent with the results from previous studies [6, 8, 10, 17].

Of the factors involved in the differential diagnosis of DH, a number of conditions were suggested such as 'gingival recession' due to periodontal disease post-operative sensitivity, periodontal disease, bleaching sensitivity, tooth surface loss, dental caries etc. It was evident that most of the participants considered a differential diagnosis when diagnosed DH and as such understand the importance of differential diagnosis by excluding other dental conditions

when diagnosing DH. Most participants reported that they were “confident” in their diagnosis of DH, which was consistent with the recent study of Pereira et al. [17]. The participants also reported a range of categories for assessing the patient’s complaint in the dental practice environment which included the self-reported of DH by the patient together with a range of clinical tests and investigations which was in agreement with previous studies [8, 17].

The majority of dentists were aware that the “hydrodynamic theory” was the currently accepted mechanism of pain from DHS which was in agreement with previous studies [6, 17].

When asked about the duration of discomfort following non-surgical and surgical periodontal procedures, most of the respondents reported that they expected discomfort to continue for 3-5 days following non-surgical periodontal treatment and two weeks following periodontal surgery which was consistent with the observations from previously published studies and was not considered a major concern by the participants [22, 24-25].

Most participants opted for using the category “Education on a correct non-destructive tooth brushing technique” when asked for how they would treat DH rather than using the “At-home use of a desensitizing dentifrice.” This was in disagreement with the results from the recent Pereira et al. [17] study who suggested that the most common management strategy employed by dentists was to prescribe desensitizing agents for home use. Of these methods of treatment, the most commonly prescribed method at home use by Kuwaiti dentists was the use of desensitizing toothpastes (non-specific) [(20.5%), n=39]. The use of fluoride agent (varnish/ gel/ duraphat toothpaste) was the most recommend professionally applied product which [(54.5%), n=72]. 91.2% (n=145) of dentists indicated that they were confident in recommending OTC products for home use with Sensodyne brands being the most recommended. When asked how confident they were in recommending appropriate home use products for patients experiencing DH most participants indicated that they were reasonably confident in their recommendations although compared to other studies their range of selected products was somewhat limited [6, 22].

When asked whether their patients complaining of DH may also have non-dental related problems in their daily life, which may contribute to the clinical problem most of the participants indicated ‘No’ or ‘they did not know’. Of those participants who indicated “Yes” Stress, Bruxism and Dietary concerns were the main responses.

When asked whether they thought that their patients complied with the professional advice regarding the treatment and management of DH, 56.3% (n=89) indicated that their patients did comply with their advice.

Some of the participants indicated that there was a need to provide further information on the condition to patients in the form of leaflets etc., in terms of prevention and awareness. However, it is evident that both Academia and Industry have published or advertised extensively on DH and therefore the problem may be one of availability of this information or the lack of apparent interest in the problem since it may be perceived as a minor inconvenience to the dentist and the patient.

In conclusion, the present study observed that the perceived prevalence of DH by Kuwaiti dentists was relatively lower than previously reported studies. Overall, the perception of most participating Kuwaiti dentists on the aetiology, diagnosis and management of DH, was generally consistent with the current scientific consensus on DH, although there was still confusion concerning some of the aspects of the diagnosis and management of the condition.

#### References

1. Gillam D.G, Seo H, Bulman J.S, et al. Perceptions of dentine hypersensitivity in a general practice population. *J Oral Rehabil* 1999; 26: 710-714.
2. Rees JS. The prevalence of dentine hypersensitivity in general dental practice in the UK. *J Clin Periodontol* 2000; 27(11): 860-865.
3. Murray LE, Roberts AJ. The prevalence of self-reported hypersensitive teeth. *Arch Oral Biol* 1994; 39: 129.
4. Irwin CR, McCusker P. Prevalence of dentine hypersensitivity in a general dental population. *J Ir Dent Assoc* 1997; 43(1):7-9.

5. Clayton DR, McCarthy D, Gillam DG. A study of the prevalence and distribution of dentine sensitivity in a population of 17–58year-old serving personnel on an RAF base in the Midlands. *J Oral Rehabil* 2002; 29(1): 14-23.
6. Amarasena N, Spencer J, Ou Y, et al. Dentine hypersensitivity in a private practice patient population in Australia. *J Oral Rehabil* 2011; 38(1):52-60.
7. Schuurs AH, Wesselink PR, Eijkman MA, et al. Dentists’ views on cervical hypersensitivity and their knowledge of its treatment. *Endod Dent Traumatol* 1995; 11(5): 240-244.
8. Gillam DG, Bulman JS, Eijkman MA, et al. Dentists’ perceptions of dentine hypersensitivity and knowledge of its treatment. *J Oral Rehabil* 2002; 29(3): 219-225.
9. Benoist FL, Ndiaye FG, Faye B, et al. Knowledge of and Management Attitude regarding Dentin Hypersensitivity among Dentists from a West African Country. *The Journal of Contemporary Dental Practice* 2014; 15(1):86-91.
10. Canadian Advisory Board on Dentin Hypersensitivity. Consensus-based recommendations for the diagnosis and management of dentin hypersensitivity. *J Can Dent Assoc* 2003; 69(4): 221-226.
11. Cunha-Cruz J, Wataha JC, Zhou L, et al. Treating dentin hypersensitivity: Therapeutic choices made by dentists of the Northwest PRECEDENT network. *J Am Dent Assoc* 2010; 141(9): 1097-1105.
12. Hatton J, Kumar K, Gillam DG. Knowledge of Dental Undergraduates and Dentists in treating Dentine Hypersensitivity. *J Dent Res* 2012; 91: 2294.
13. Chana B, Kumar K, Gillam D. Knowledge of UK Dental Professionals in Treating Dentine Hypersensitivity. IADR-SEA Annual Scientific Meeting November 3rd-4th 2012 (Poster Abstract).
14. Gillam D, Chesters R, Attrill D, et al. Dentine hypersensitivity-guidelines for the management of a common oral health problem. *Dent Update* 2013; 40: 514-524.
15. Pereira JC, Francisconi L, Calabria M. Knowledge of Brazilian Dentists and Students in Treating Dentine Hypersensitivity. *J Dent Res* 2013; 92: 2193.
16. Gillam DG. Current diagnosis of dentin hypersensitivity in the dental office: an overview. *Clin Oral Invest* 2013; 17:21-29.
17. Pereira R, Gillam DG, Pathak T and Satyamurthy P. Prevalence and Pattern of Dentine Hypersensitivity in a population of patients at MGM Dental College, Navi Mumbai City, India. *J Odontol* 2018; 2(1).
18. Graf H, Galasse R. Morbidity, prevalence and intraoral distribution of hypersensitive teeth. *J Dent Res* 1977; 56: 162-165.
19. Fischer C, Fischer RG, Wennberg A. Prevalence and distribution of cervical dentine hypersensitivity in a population in Rio de Janeiro. *Braz J Dent* 1992; 20: 272-276.
20. Cunha-Cruz J, Wataha JC, Heaton LJ, et al. The prevalence of dentin hypersensitivity in general dental practices in the northwest United States. *J Am Dent Assoc* 2013;144(3): 288-296.
21. Bamise CT, Olusile AO, Oginni AO, et al. The prevalence of dentine hypersensitivity among adult patients attending a Nigerian teaching hospital. *Oral Health Prev Dent* 2007; 5(1):49-53.
22. Gillam DG, Seo HS, Bulman JS, et al. Comparison of Dentine Hypersensitivity in Selected Occidental and Oriental Populations. *J Oral Rehabil* 2001; 28:20-25.
23. Chabanski MB, Gillam DG, Bulman JS, et al. Prevalence of cervical dentine sensitivity in a population of patients referred to a specialist Periodontology Department. *J Clin Periodontol* 1996; 23: 989-992.
24. Von Troil B, Needleman I, Sanz M. A systematic review of the prevalence of root sensitivity following periodontal therapy. *J Clin Periodontol* 2002; 29(3):173-177.
25. Lin YH, Gillam DG. The Prevalence of Root Sensitivity following Periodontal Therapy: A Systematic Review. *Int J Dent* 2012; 2012:407023.