

ORIGINAL RESEARCH

Knowledge of and Management Attitude regarding Dentin Hypersensitivity among Dentists from a West African Country

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ABSTRACT

Aim: The aim of the present study was to assess knowledge of, and management attitude of dentists regarding Dentin hypersensitivity.

Materials and methods: The study involved all the dentists from private and public sectors, exerting in Senegal. The following data were requested from the surveyed dentists using an anonymous questionnaire; sociodemographics (i.e. age, gender, area of activity, etc.) and knowledge on triggering factor, type of pain, diagnosis, preventive and curative procedures.

Results: Out of the 238 dentists who received the questionnaire, 68.9% returned properly filled forms. They were 116 males and 48 females with a mean age of 41.99 ± 8.50 years. Eighty three percent of the participants had a good understanding of the characteristics of pain related to DH and 92% recognized chemical and thermal stimuli as triggering factor while mechanical stimulus was not evoked. Many responders (90.9%) did not have any idea of the mechanism for pain transmission across the dentin. Regarding diagnosis technique, 68% use mechanical stimuli to elicit DH pain.

Regarding management procedure, the use of desensitizing tooth paste is the mostly chosen option followed by professional topical application of fluoride. More than 1/3rd of the surveyed dentists confess resorting to root canal to manage DH.

Conclusion: We recommend incorporation of basic science knowledge on orofacial pain and competencies to manage painful conditions like dentin hypersensitivity. Also, Health regulatory institutions should make continuing dental education a requirement to preserve the dental licensure.

Keywords: Dentin hypersensitivity, Knowledge, Management, General dental practitioners.

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INTRODUCTION

Dentin hypersensitivity (DH) is described as a short sharp pain arising from an exposed dentin, to evaporative, thermal, tactile, osmotic or chemical stimuli and that cannot be ascribed to any other dental defect or disease. It is a frequent condition with a prevalence rate ranging from 4 to 74% depending on the population surveyed and the diagnostic criteria used.¹⁻¹⁴ According to many authors, DH affects daily life of subjects because of the transient but recurrent pain elicited during oral activities like eating, drinking, brushing of teeth and even breathing.^{15,16} Medicinal and management strategies have been proposed to alleviate symptoms associated with the condition and evidence exists to suggest that some of them may be effective although not always for a long period.

In dental education institutions of developing countries especially in the sub-Saharan subregion efforts are concentrated in providing knowledge and management skills on most common dental diseases (caries, periodontal disease, etc.) to dental students. In Senegal for instance, which houses the 2nd oldest West African dental school (after Lagos in Nigeria) such conditions like DH are not formally taught to dental students. Thus, from an academic point of view, a discrepancy exists between the relative frequency of DH, its associated morbidity and the controversial effectiveness of available treatment on one hand, and the limited attention it receives within the undergraduate dental timetable on the other hand. Continuing dental education may valuably complement the shortcomings related to the limitations of dentists in this regard. However, this is not yet a requirement to preserve the dental licensure as it is in many western countries.

Numerous studies have been undertaken in developed countries to assess dentist's knowledge on DH. For instance, Gillam et al,¹⁶ reported results of a survey on 181 UK dentists' perception of DH and knowledge of its treatment. They reach the conclusion that globally most dentists appeared to understand the etiology of DH and provided

correct advises to their patients. Amarasena et al¹⁷ in their study involving 284 Australian private dentists found that their perception of DH is generally consistent with the current scientific consensus on this subject. On the other hand, in a survey on 331 dentists and 211 hygienists, the Canadian Advisory Board¹⁸ on Dentin Hypersensitivity (2003) identified 14 key knowledge gaps related to the causes, diagnosis and management of DH.

African data on this subject matter are, however still lacking. To date, the only African study on practitioner's knowledge on DH has been conducted in Morocco. This study which included 100 general dental practitioners reported that only 3% of the surveyed dentists know the theoretical explanation of the pain conduction across the dentin and 31.57% of them suggested fluoride as a major treatment option.¹⁹

Therefore, the present study was conducted to assess knowledge of Senegalese Dentist on DH. Data collected may be useful in planning curricula and continuing education geared toward these subjects.

MATERIALS AND METHODS

The study involved the 238 dentists from both private and public sector, exerting in the 14 administrative regions of Senegal at the time of the survey and whose name was present in the 2012 list of the National Dental Council.

Data collection required the use of an anonymous questionnaire made up with 9 items. These included mainly sociodemographic data (i.e. age, gender, area of activity, etc.) and knowledge on triggering factor, type of pain, diagnosis, preventive and curative procedures (Appendix 1).

The questionnaire was mailed to all the targeted dentists with an accompanying letter emphasizing the confidentiality, and asking them to fill it out as objectively as possible. The surveyed dentists were also requested to return back the form to the investigators using the provided postage prepaid envelope. A reminder was later sent to the nonrespondent 2 weeks and 1 month after the supposed date of reception of the questionnaire.

The data collected were entered in a spreadsheet and then transferred to SPSS[®] (Statistical Package for Social Sciences, release 17 for Windows[®]) for analysis.

RESULTS

Out of the 238 dentists who received the questionnaire and a reminder, 164 returned (68.9%) properly filled forms. Of these, 116 were from males and 48 from females. The mean age of the whole sample was 41.99 ± 8.50 years with a minimum of 27 years and a maximum of 68 years (Table 1). More than half of the practitioners who responded to the questionnaire ($n = 88$) worked in private practice and the remaining dentists were from public hospitals (Table 1). There were no significant differences with respect to age in the whole sample when subjects are grouped according to gender and within each sex group when subjects are grouped according to practice pattern (private, public).

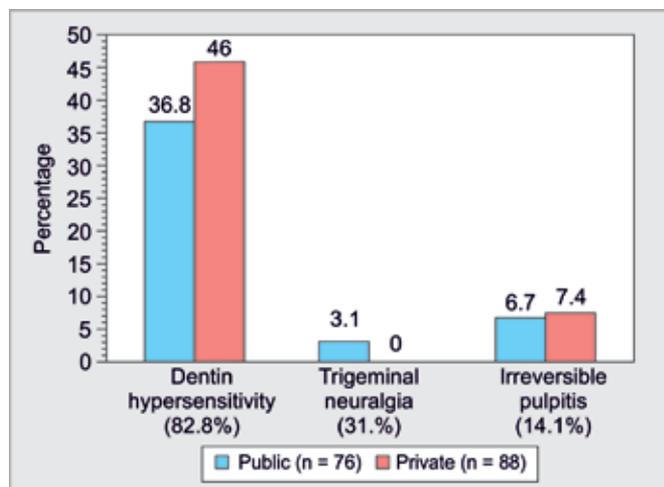
Almost 83% of the participants found the definition tally with that of DH or in other words, had an accurate understanding of the characteristics of pain related to DH (Graph 1). When practice type in taken into account, it appears that significantly more dentists working in private practice display correct answers ($p = 0.02$).

Table 1: Demographic characteristics of the surveyed dentists

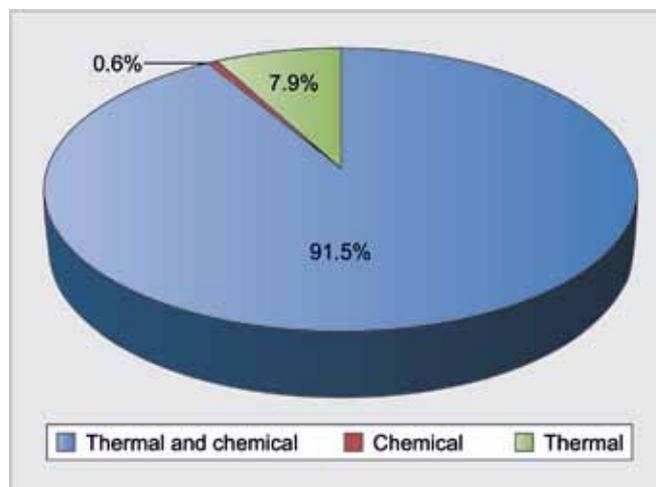
		Age (years)				t-test (p-values)		
		Mean	Standard deviation	Min.	Max.	Among men	Among women	Whole sample
Men (n = 116)	Public (n = 55)	41.63	9.07	27	61	0.40		0.52
	Private (n = 61)	43.07	8.89	28	68			
Women (n = 48)	Public (n = 21)	40.26	7.482	29	56	0.58		
	Private (n = 27)	41.50	7.151	27	51			

Table 2: Preventive measures suggested by surveyed dentist

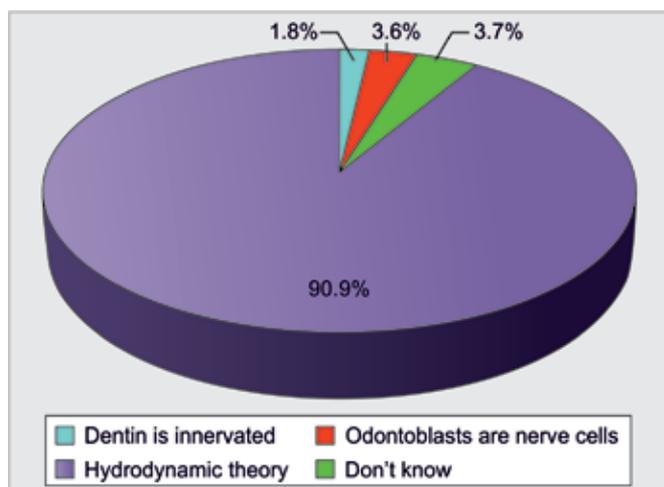
Preventive measures	Type of practice		Total n%	χ^2 test p-value
	Public	Private		
No	21 12.8%	15 9.1%	36 22%	
Risk factor suppression	43 26.2%	57 34.8%	100 61%	
Avoid acidic diet	51 31.1%	65 39.6%	116 70.7%	
Avoid brushing soon after meal	34 20.7%	41 25%	75 45.7%	



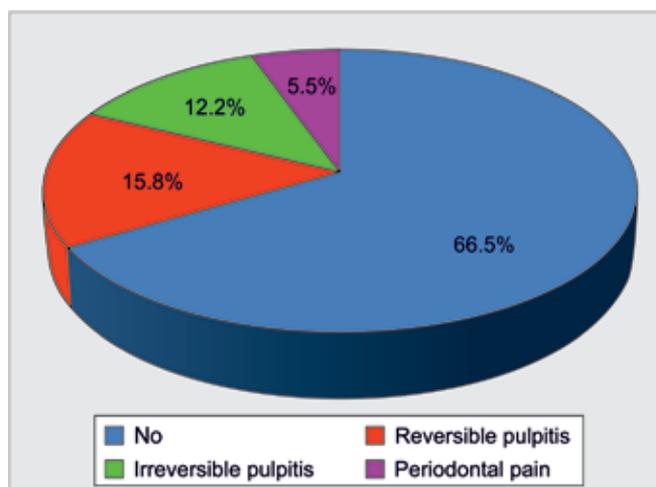
Graph 1: Percentage distribution by practice mode of the definitions suggested regarding pain associated with dentin hypersensitivity (n = 164)



Graph 2: Percentage distribution of the suggested triggering factors for dentin hypersensitivity (the adjectives thermal, chemical or mechanical refer to different stimuli) (n = 164)



Graph 3: Percentage distribution of suggested mechanism of pain transmission across the dentin (n = 164)



Graph 4: Percentage distribution of the different pain conditions that require differential diagnosis with dentin hypersensitivity (n = 164)

A majority of dentists (92%) reported that DH was triggered by chemical (acid and/or sweet) and thermal (cold and/or heat) stimuli (Graph 2). Mechanical stimulus was not evoked by any of them. Also, many responders either did not know (90.9%) or suggested incorrect theories regarding the mechanism of pain transmission across the dentin (4.8%) (Graph 3).

Regarding diagnosis technique, it appears from the response received that 113 dentists (68%) use mechanical stimuli (air flow, probing and percussion) to elicit DH pain although only 30 of them (18%) implement systematic screening for this condition during routine examination of their patients.

In terms of differential diagnosis, 33.5% of the practitioners acknowledge implicitly the idea of differential diagnosis when faced with other tooth pain. In particular, both irreversible and reversible pulpitis and periodontal pain are pathological condition reported by the surveyed practitioners to evoke DH (Graph 4).

Preventive measures are advised by 128 dentists (78%). These included risk factor elimination, avoidance of acidic

diet and brushing soon after meals (Table 2). With respect to management procedures, the use of desensitizing tooth paste is the mostly chosen option followed by professional topical fluoride application (PTFA) (Table 3). Sixty-two dentists (37.8%) confess resorting to root canal to manage DH, only one dentist uses gingival grafting. Laser was not mentioned as a method of treating DH. Overall, the type of practice (private or public) did not have significant influence on these results.

DISCUSSION

According to Dowell and Addy,²⁰ 1 adult out of 7 reported suffering from DH. This condition is also reported to represent 1/5th of dental disease related emergencies.²¹ It is therefore important for any dentist to have thorough understanding of its features, initiating factors and management options. The survey reported herein was concerned with the assessment of Senegalese dentist's knowledge on this condition.

Table 3: Management options suggested by surveyed dentists

Management options	Type of practice		Total n %	χ^2 test p-value
	Public	Private		
PTFA*	54 32.9%	69 42.1%	123 75.0%	
Desensitizing toothpaste	56 34.1%	79 48.2%	135 82.3%	
Adhesive resins	50 30.5%	55 33.5%	105 64.0%	
Endodontics	22 13.4%	40 24.4%	62 37.8%	
Mucogingival surgery	0 0%	1 0.6%	1 0.6%	

*PTFA = Professional topical fluoride application

The response rate of almost 70% was quite satisfactory given the number of items that made up the questionnaire. The reasons for 30% of the dentists for not filling the questionnaire are unknown. However, one can argue that part of the nonrespondents might have judged the questionnaire as an intrusion into their practice. These results compare well with those of Schuurset al²² who reached a response rate of 64.7% in a sample of 400 Dutch general dental practitioners and are even better than those reported for UK dentists (44.9%).⁶

In investigating the dentists understanding of the features of DH, the questionnaire suggested a complete depiction of pain arising from irreversible pulpitis, trigeminal neuralgia and dentin hypersensitivity. Surveyed dentists were then requested to indicate which of these description best referred to DH. From the questionnaire it was possible to infer that the majority of them (83%) have an accurate understanding of the features of the pain associated with DH. To the best of our knowledge, this issue has never been investigated in former studies making comparison impossible.

The surveyed dentists were asked if they perform differential diagnosis when faced to other painful conditions. The result of 2/3rd of them rejecting the idea of differential diagnosis was somewhat striking because DH is a true "pain syndrome" with specific features allowing differentiation with other dental pain and also its diagnosis is by essence one of exclusion. The opportunity given in the questionnaire to openly specify painful conditions showed that both reversible and irreversible pulpitis and periodontal pain may evoke DH for 33.5% of the dentists.

The results of the present study indicate that 92% of the surveyed dentist identified chemical (acid and/or sweet) and thermal (cold and/or heat) as main triggering factor for DH. Mechanical stimuli were not referred to by the majority of them although pain occurring during daily life activities such as tooth brushing can provoke pain from sensitive dentin. The same findings were reported in a Moroccan survey

involving 100 dentists.¹⁹ This lack of knowledge regarding triggering factors was also reported in an earlier Canadian study published 10 years ago with almost 2/3rd of the surveyed dentists identifying bruxism and malocclusion as triggers of HD.¹⁸ It was however contradictory that despite their poor understanding of triggering factors, 113 dentists (68%) used mechanical stimuli (probing) during clinical examination to diagnose DH.¹⁸

Systematic screening for DH during routine clinical examination is carried out by only 18% of the dentists included in this study. One of the reasons for this may be their focusing on common oral pathologies such as dental caries and periodontal diseases which is responsible for more important morbidity. However, this is not in line with the findings of 80% of the surveyed dentists suggesting preventive measures against DH with risk factor elimination as main recommendations to patients. It did not seem logical that with such lack of consideration during routine dental checkup, 4/5th of the surveyed dentists advise prevention for DH. It is also possible that the questionnaire was somewhat suggestive, directing the respondent to specific viewpoint.

It appears also from the questionnaire that the majority of the dentists favor a treatment modality with desensitizing agents, professionally applied fluoride and restoration of tooth substance loss while 16% suggest using desensitizing agent alone. These results contrast with those reported earlier by Schuurset al²² who found in their survey of 400 Dutch dentists, 77% advising the use home-care methods like therapeutic toothpastes and by Gillam et al¹⁶ who reported use of tooth paste as a predominant choice by UK dentists.

CONCLUSION

The following conclusions are reached as a result of this study:

- The majority of the dentists from this West African country seems to be well informed regarding the features

of pain associated with DH but lack knowledge on its triggering factors and theory explaining the tooth sensitivity

- Many of the responders do not show enough skills to diagnose, prevent and manage efficiently DH.

The following recommendations can be made on the basis of these results:

- Dental education institutions in West Africa should include in their curricula basic science knowledge on orofacial pain and competencies to manage relatively frequent and debilitating condition like DH.
- Health regulatory institutions should make continuing dental education a requirement to preserve the dental licensure as it is in many western countries.

APPENDIX 1: Assessment Form

Socio Demographic Data

Age:..... years

Sex: Male Female

Type of Practice

1. Private
2. Public

In your opinion, which of the following sentences best depict Dentin Hypersensitivity?

1. Short sharp pain arising from an exposed dentin, to evaporative, thermal, tactile, osmotic or chemical stimuli and that cannot be ascribed to any other dental defect or disease.
2. Sharp, severe, radiating pain of long duration and varying intensity occurring spontaneously or following a hot or cold stimulus. In the latter case, the pain may linger even after the stimulus is removed.
3. Intermittent, sharp, stabbing, shooting pain in the cheek, lips, gums, or chin on one side being able to build in strength, decrease and begin again, and then abruptly end. It can be triggered by stimuli as light as a breeze or a touch on the face.

In your opinion, which of the following stimulus triggers Dentin Hypersensitivity?

1. Cold
2. Hot
3. Sweet
4. Acidic
5. mechanical
6. Others Specify please

Do you know any theory explaining the perception of pain across the dentin?

1. Yes Specify please
2. No

What technique do you use to detect and diagnose Dentin Hypersensitivity?

1. Air flow
2. Percussion
3. Probing
4. Questioning

5. Hot test
6. Others

Do you implement systematic screening for this condition during routine examination of your patients?

1. Yes
2. No

Do you perform differential diagnosis between dentin hypersensitivity and other painful condition?

1. Yes Specify.....
2. No

Which of the following preventive measures do you advise to your patient to avoid Dentin hypersensitivity?

1. No preventive measure
2. Risk factor elimination
3. Avoid acidic diet
4. Avoid brushing immediately after eating
5. Avoid frequent and or inadequate brushing
6. Others Specify.....

Which of the following options are you using to manage dentin hypersensitivity?

1. Topical application of fluoride
2. Desensitizing Toothpaste
3. Varnish
4. Adhesives
5. Root canal
6. Mucogingival surgery
7. Others Specify.....

REFERENCES

1. Addy M, Urquhart E. Dentine hypersensitivity: its prevalence, aetiology and clinical management. Dent Update 1992;19(10):407-412.
2. Amarasena N, Spencer J, Ou Y, Brennan D. Dentine hypersensitivity in a private practice patient population in Australia. J Oral Rehabil 2011;38(1):52-60.
3. Bahsi E, Dalli M, Uzgur R, Turkal M, Hamidi MM, Colak H. An analysis of the aetiology, prevalence and clinical features of dentine hypersensitivity in a general dental population. Eur Rev Med Pharmacol Sci 2012;16(8):1107-1116.
4. Bamise CT, Olusile AO, Oginni AO, Dosumu OO. The prevalence of dentine hypersensitivity among adult patients attending a Nigerian teaching hospital. Oral Health Prev Dent 2007;5(1):49-53.
5. Chabanski MB, Gillam DG, Bulman JS, Newman HN. Prevalence of cervical dentine sensitivity in a population of patients referred to a specialist periodontology department. J Clin Periodontol 1996;23(11):989-992.
6. Gillam DG, Aris A, Bulman JS, Newman HN, Ley F. Dentine hypersensitivity in subjects recruited for clinical trials: clinical evaluation, prevalence and intraoral distribution. J Oral Rehabil 2002;29(3):226-231.
7. Gillam DG, Seo HS, Newman HN, Bulman JS. Comparison of dentine hypersensitivity in selected occidental and oriental populations. J Oral Rehabil 2001;28(1):20-25.
8. Liu HC, Lan WH, Hsieh CC. Prevalence and distribution of cervical dentin hypersensitivity in a population in Taipei, Taiwan. J Endod 1998;24(1):45-47.
9. Oderinu OH, Savage KO, Uti OG, Adegbulugbe IC. Prevalence of self-reported hypersensitive teeth among a group of Nigerian



- undergraduate students. *Niger Postgrad Med J* 2011;18(3): 205-209.
10. Rees JS. The prevalence of dentine hypersensitivity in general dental practice in the UK. *J Clin Periodontol* 2000;27(11):860-865.
 11. Rees JS, Jin LJ, Lam S, Kudanowska I, Vowles R. The prevalence of dentine hypersensitivity in a hospital clinic population in Hong Kong. *J Dent* 2003;31(7):453-461.
 12. Taani DQ, Awartani F. Prevalence and distribution of dentin hypersensitivity and plaque in a dental hospital population. *Quintessence Int* 2001;32(5):372-376.
 13. Tengrungrun T, Jamornnium Y, Tengrungrun S. Prevalence of dentine hypersensitivity among Thai dental patients at the faculty of dentistry, Mahidol University. *Southeast Asian J Trop Med Public Health* 2012;43(4):1059-1064.
 14. Wang Y, Que K, Lin L, Hu D, Li X. The prevalence of dentine hypersensitivity in the general population in China. *J Oral Rehabil* 39(11):812-820. Ye W, Feng XP, Li R (2012). The prevalence of dentine hypersensitivity in Chinese adults. *J Oral Rehabil* 2012;39(3):182-187.
 15. Boiko OV, Baker SR, Gibson BJ, Locker D, Sufi F, Barlow AP et al. Construction and validation of the quality of life measure for dentine hypersensitivity (DHEQ). *J Clin Periodontol* 2010; 37(11):973-980.
 16. Gillam DG, Seo HS, Bulman JS, Newman HN. Perceptions of dentine hypersensitivity in a general practice population. *J Oral Rehabil* 1999;26(9):710-714.
 17. Amarasena N, Spencer J, Ou Y, Brennan D. Dentine hypersensitivity—Australian dentists' perspective. *Aust Dent J* 2010;55(2):181-187.
 18. 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.
 19. Manal E, Iman B, Amal E. Enquête auprès de 100 dentistes marocains sur la prise en compte et la prise en charge de l'hypersensibilité dentinaire. *Journal de l'Ordre des dentistes du Québec* 2007;44:365-375.
 20. Dowell P, Addy M. Dentine hypersensitivity — a review. Aetiology, symptoms and theories of pain production. *J Clin Periodontol* 1983;10(4):341-350.
 21. Stewardson DA, Crisp RJ, McHugh S, Lendenmann U, Burke FJ. The Effectiveness of Systemp.desensitizer in the treatment of dentine hypersensitivity. *Primary Dental Care* 2004;11:71-76.
 22. Schuurs AH, Wesselink PR, Eijkman MA, Duivenvoorden HJ. Dentists' views on cervical hypersensitivity and their knowledge of its treatment. *Endodontics & Dental Traumatology* 1995;11:240-244.