Association between toothbrush bristles stiffness and dentine hypersensitivity: a systematic review

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ABSTRACT

Background: Dentine hypersensitivity (DH) is a common condition that affects oral health-related quality of life. Toothbrush bristle stiffness has been suggested as a contributing factor. This systematic review aimed to answer the question: *Is there an association between toothbrush bristle stiffness and the prevalence of dentine hypersensitivity in adults?* **Methods:** A structured literature search was conducted in PubMed, EMBASE, Scopus, and Web of Science up to January 2025, following PRISMA guidelines. Search terms included "dentine hypersensitivity," "toothbrush bristle," "bristle stiffness," and related keywords. Observational studies assessing DH in individuals using toothbrushes with different bristle stiffness (soft, medium, or hard) were included. Studies involving participants under 18 or those with orthodontic appliances were excluded. Two reviewers independently screened studies and assessed quality using the JBI Appraisal Checklist. **Results:** Of 2,694 records, two cross-sectional studies met the inclusion criteria. One reported similar DH prevalence with soft (35.6%) and medium/hard (32.7%) bristles. The other found a slightly higher prevalence with medium bristles (53%). No significant associations were reported. A narrative synthesis was performed due to heterogeneity. **Discussion:** Both studies had a high risk of bias, they showed inconsistencies in measuring bristle stiffness and failed to control for confounding factors such as brushing force or technique. The GRADE assessment rated the quality of evidence as very low. **Conclusion:** There is no clear association between toothbrush bristle stiffness and DH prevalence. Brushing technique and force may be more influential and should be emphasized in clinical recommendations.

Keywords: bristle stiffness; dentine hypersensitivity; oral health; toothbrushing

CDHA Research Agenda category: risk assessment and management

INTRODUCTION

Dental plaque is the primary etiological factor of periodontal diseases (1). The literature demonstrates that approximately 95% of the world's population is affected by gingivitis, with around 45% experiencing periodontitis (2). Toothbrushing remains the most widely used method for preventing and treating both gingivitis and periodontitis, as it aims at disrupting oral biofilms, playing a fundamental role in prevention and control of the most prevalent oral diseases, such as dental caries and periodontal diseases (3).

Manual toothbrushes are among the most used and consumed oral health product globally for preventing dental caries and periodontal diseases. However, improper toothbrushing can generate adverse effects that include non-carious cervical lesions, gingival fissures, gingival recessions, dentine hypersensitivity, among others (4–7).

Within the category of manual toothbrushes, there exists a variety of bristle stiffness and shapes. Bristle stiffness categories include hard, medium, soft, and extra-soft. Over the past decade, dentists have increasingly recommended soft bristle toothbrushes in an attempt to reduce the occurrence of the abovementioned adverse effects, since the harder the bristles, the higher the chances of the negative effects to occur (8).

These adverse effects varied and include gingival recession and non-carious cervical lesions. Among lesions in the hard dental tissues, dental abrasion, which defined as the wear of teeth normally by mechanical means is prevalent (9). This tooth wear, in turn, can lead to dentine hypersensitivity—a short, sharp, rapid form of pain that depends on the stimulus (10). It is important to clarify that DH is distinct from general “tooth sensitivity,” which can also refer to other conditions such as post-bleaching sensitivity. In this review, we exclusively refer to clinically diagnosed dentine hypersensitivity. The prevalence of dentine hypersensitivity varies according to the setting where the study was performed,

as well as the population under study and the method for detection. Estimates as low as 1.3% and as high as 91.1% have been reported (11). This wide range of prevalence estimates is related to the fact that the majority of studies are non-representative, with a high variance of age and gender among the included samples.

Although abrasion contributes to the onset and progression of dentine hypersensitivity, it is now recognized that erosion, defined as the loss of dental hard tissue due to acidic dissolution without bacterial involvement, is the primary etiological factor (12,13). Erosive challenges increase dentine permeability by opening the dentinal tubules, and subsequent mechanical abrasion from toothbrushing exacerbates this exposure (12).

In addition, the place where the study is performed – dental clinic, school, hospital, etc. – and the age of the included individuals are also responsible for the encountered results. One of the few representative studies about the prevalence of dentine hypersensitivity was performed by Costa et al and demonstrated that with both air jet and tactile stimuli, approximately one in every 3 adults is affected by dentine hypersensitivity (14). The same study analyzed the impact of oral conditions including dentine hypersensitivity and demonstrated that oral health-related quality of life (OHRQoL) score is higher among those affected by dentine hypersensitivity, meaning that it impacts quality of life (14,15).

Another study measured the Oral Health-related Quality of life on patients which that seek care for dentine hypersensitivity and it suggests that individuals affected by the condition present approximately 22 higher mean scores in the OHRQoL tool than the general population(16). This leads to the understanding that dentine hypersensitivity is associated with an impaired quality of life (16). It is therefore recommended that dentine hypersensitivity should be targeted to improve oral health and, consequently, OHRQoL(16).

Another aspect of importance is that the stiffness of the bristles of the toothbrushes are of importance(17). Medium bristle toothbrushes caused significantly higher abrasive dentine wear and it also increased with an increased brushing force(17,18). The literature suggests that soft bristle toothbrushes cause less abrasive wear than the medium bristle brush (17). With this in mind, it is of importance to assess the inter-relationship between toothbrushing habits and instruments and dentine hypersensitivity. The aim of this systematic review is to evaluate the association of bristle stiffness with the presence of dentine hypersensitivity.

MATERIALS AND METHODS

The focused question for this systematic review was "Is the stiffness of toothbrush bristles associated with dentine hypersensitivity?" The following PECO (Patient-Exposure-Comparison-Outcome) question is to be answered:

P: Systemically Healthy Patients

E: Use of hard or medium toothbrushes

C: Use of soft or extra-soft toothbrushes

O: Dentine Hypersensitivity

Registration of protocol

The search strategy employed to identify relevant articles for this review adhered to the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Additionally, this systematic review was registered in the International Prospective Register of Systematic Reviews (PROSPERO) with the protocol CRD42022324936.

Search strategy

A systematic search potential for relevant studies was conducted up to January 24th, 2025. The explored databases were: EMBASE, SCOPUS and PubMed. For PubMed database, the following search strategy was used using the following MeSH (Medical Subject Headings) terms, which were adjusted for each database:

#1: "Dentine Sensitivity"[Mesh] OR "Dentine Sensitivities" [tw] OR "Sensitivity, Dentin" [tw] OR **Sensitivities, Dentine[**tw**] OR** "Dentine Hypersensitivity" [tw] OR "Hypersensitivity, Dentine" [tw] OR "Dentine Sensitivity" [tw] OR "Sensitivity, Dentine" [tw] OR **Hypersensitivities, Dentine[**tw**] OR Sensitivities, Dentine[**tw**] OR** "Tooth Sensitivity"[tw] OR "Sensitivity, Tooth"[tw] OR "Dentine Hypersensitivities"[tw] OR "Hypersensitivity, Dentin"[tw] OR **Sensitivities, Tooth[**tw**] OR Dentine hypersensitivity[**tw**]**

#2: "Toothbrushing" [Mesh] **OR toothbrushing[**tw**] OR toothbrush[**tw**] OR bristle[**tw**] OR bristles[**tw**] OR soft[**tw**] OR medium[**tw**] OR hard[**tw**]**

#3: #1 AND #2

Table S1 shows the detailed search strategies for the other databases. Potential studies were exported to Rayaan (19) (Rayaan Systems Inc, USA), a web and mobile app for systematic reviews, to identify and remove duplicates by two reviewers. Hand search in the reference lists of included studies was also conducted to identify eventual additional studies. A third researcher was involved in case of discrepancies.

Eligibility criteria

For a study to be considered eligible, it needed to be an observational study published in peer-reviewed journals that examined the presence of dentine hypersensitivity assessed by clinical examination (whether using air jet or a periodontal probe) in individuals using hard or medium toothbrushes, and compared to those using soft/extra-soft toothbrushes. No language restrictions were applied. Case reports, case series, review articles, opinion articles, correspondence, editorials, and letters were not considered eligible. In addition, clinical studies of underage individuals (<18 years), and patients using orthodontic appliances were not included. As the included studies were cross-sectional observational in their designs, we acknowledge that the findings are limited in establishing causal relationships.

Study selection

Literature search was conducted by an independent researcher who followed the inclusion and exclusion criteria. Subsequently, two researchers independently screened the identified publications based on title, abstract, and full text. Concordance was achieved with a high Kappa index (0.83). Discordances were resolved through discussion and agreement with a third author. Duplicates were identified and removed using Rayaan, and the retrieved publications were classified and stored. In cases where additional information should be necessary, email contacts were made with the corresponding author of the article, with up to three attempts.

Data extraction and analysis

After the studies were selected, two researchers extracted all the relevant data according to the PECO question (Presence of Dentine hypersensitivity) independently to an Excel (MS Office) sheet. The data was taken from the tables on each article and transcribed without any alteration. After a meeting the first two researchers agreed or not on all the relevance of all the data collected.

Discordances were solved through discussion and agreement with a third author on a posterior meeting. The following variables were collected: presence of dentine hypersensitivity by probe, presence of hypersensitivity by air stimulation and bristle type (soft and medium/hard). The findings were assessed and described qualitatively.

Risk of bias

Two researchers assessed the risk of bias within the studies. A Series of questions were answered to determine if there was an overall appraisal of each study using the JBI Appraisal Checklist for Analytical Cross Sectional Studies (20). A third researcher was involved in case of discrepancy. If one question was marked as "unclear" or "no," the study was characterized as a High risk of bias.

Data synthesis

Meta-Analysis was not feasible, considering the high heterogeneity among the included studies. Therefore, the results are presented descriptively for dentine hypersensitivity.

GRADE assessment

The quality of evidence for the outcome (dentine hypersensitivity) was assessed using the GRADE (Grading of Recommendations Assessment, Development, and Evaluation) approach. The GRADE assessment considered the following criteria:

- Risk of Bias: Downgraded if more than half of the included studies were judged to have a high risk of bias.
- Consistency: Adress the heterogeneity of the studies qualitatively using a narrative synthesis to explain similarities or differences across the studies
- Directness: Downgraded if the populations, interventions, comparison groups, or outcomes were not directly relevant to the review question.

- Imprecision: Downgraded if the total sample size was insufficient.

RESULTS

General characteristics of included studies

As a result of the search strategy performed, 2694 articles were identified. Of these, 2 were included in this systematic review. Figure 1 presents the flowchart of study inclusion process.

Figure 1: PRISMA flowchart of study inclusion process

Two cross-sectional studies were included (21,22). One study observed the occurrence of dentine hypersensitivity diagnosed by air or probing in patients using either a soft or a medium/hard brush (21). The second study assessed the occurrence of dentine hypersensitivity through air blast or probing in another population and reported dentine hypersensitivity in patients using soft, medium, and hard toothbrushes (22). Table 1 presents a summary of the main characteristics of the included studies for this review.

The findings from Costa and Demirci suggest that the prevalence of DH is relatively consistent across bristle types (21,22). Costa reported that dentine hypersensitivity prevalence was slightly higher among users of medium/hard brushes compared to soft brushes when tested using air stimulation (35.6% vs. 32.7%) (21). However, this difference was not statistically significant. Similarly, probing assessments also showed no significant variations between bristle types (34.2% for soft brushes vs. 34.7% for medium/hard brushes) (21) (Table 1).

In Demirci's study, while most dentine hypersensitivity cases were associated with medium bristle toothbrushes (53%), soft bristles were also commonly used by dentine hypersensitivity individuals

harboring dentine hypersensitivity (45%)(22). Hard bristle toothbrushes were associated with a markedly lower prevalence of dentine hypersensitivity (6%), though this may reflect their limited use in the population rather than a protective effect. Statistical analysis did not reveal significant differences in dentine hypersensitivity prevalence among bristle types (P=0.197) (22) (Table 1).

Table I. Main Characteristics and results of the Included studies.

Risk of bias

Table 2 presents the risk of Bias Assessment using the JBI Appraisal Checklist for Analytical Cross-sectional Studies. In the overall analysis, the two selected studies present a “high” risk of bias (21,22) (Table 2).

Table II: Risk of bias assessment for included studies

Qualitative results

The first study explores the odds ratios (OR) of dentine hypersensitivity related to the use of different toothbrush bristles and the method of assessment (air vs. probe). The air stimulus assessment OR = 0.88 (95%CI: 0.57 to 1.35), indicating no significant difference in the risk of dentine hypersensitivity compared to soft bristle users. The probe stimulus assessment OR = 1.02 (95%CI: 0.67 to 1.55), also indicating no significant difference in the risk of dentine hypersensitivity (21). In the second study, the distribution of dentine hypersensitivity among users of different toothbrush types was examined (22). The differences in dentine hypersensitivity scores among the different bristle types were not statistically significant (P = 0.197) (22).

GRADE evidence profile

Table 3 illustrates the effect of Hard/Medium bristle toothbrush and dentine hypersensitivity, as compared to manual toothbrushes, is of very low certainty. The primary concern impacting this assessment may be the absence of randomization because of the lack of control of the variables. The overall findings suggest that the type of toothbrush bristle may not affect Dentine Hypersensitivity.

Table III: GRADE analysis of the included two studies examining the association of toothbrush bristle and dentine hypersensitivity.

DISCUSSION

This systematic review investigated the relationship between toothbrush bristle stiffness and dentine hypersensitivity. Only two studies were retrieved to answer the proposed focused question. Both studies assessed dentine hypersensitivity using either air stimulation or probing and evaluated its prevalence among users of soft, medium, and hard bristled toothbrushes.

The included studies were assessed as having an overall high risk of bias; however, concerns regarding the clarity of exposure measurement and the absence of control for potential confounding factors were noted. The nature of the studies as observational and cross-sectional difficult analyses of the real impact of bristle stiffness on the occurrence of dentine hypersensitivity. However, they suffice for hypothesis generating. Both studies failed to adequately address variables such as brushing technique, duration, and force, which may influence the onset of dentine hypersensitivity (21,22). These limitations highlight the need for more rigorous study designs, such as randomized controlled trials, to establish causality.

The absence of significant differences in dentine hypersensitivity prevalence across bristle types suggests that factors other than bristle stiffness, such as brushing technique, oral hygiene habits, and individual susceptibility, may play a more critical role in dentine hypersensitivity. While hard bristles have traditionally been discouraged due to their potential to cause enamel abrasion and gingival recession (23,24). These findings support the recommendation that patients should focus on using proper brushing techniques and selecting brushes that feel comfortable without causing trauma to the gingiva or teeth (25,26) Taking into consideration that harder bristles are associated with higher occurrence of gingival recession, this should be taken into consideration in the whole picture of the interpretation of the results.

One additional aspect that should not be ignored is that the cross-sectional nature of the included studies reveals the used toothbrush in the moment of assessment of dentine hypersensitivity. It could be hypothesized that the present choice of toothbrush is a consequence of the existence of dentine hypersensitivity. This is a limitation of the present review that needs to be highlighted and considered in the planning phase of primary studies in the topic.

Our findings align with existing literature indicating that toothbrush bristle stiffness does not significantly impact dentine hypersensitivity. In an *in vitro* study assessing dentine loss due to abrasion from toothbrushes with varying bristle stiffness on both eroded and sound dentine surfaces (18), no statistically significant difference in dentine loss among soft, medium, and hard bristles on eroded dentine was found. Interestingly, for healthy dentine, soft bristles resulted in higher dentine loss compared to hard bristles, suggesting that factors beyond bristle stiffness, such as brushing technique and force, may play more substantial roles in dentine abrasion and subsequent hypersensitivity (18). This supports the understanding of the existing literature that bristle stiffness alone is not a decisive factor in the occurrence of dentine hypersensitivity. Additionally, a review emphasized the multifactorial etiology of dentine hypersensitivity, highlighting the importance of proper oral hygiene practices over the specific type of toothbrush bristles used (27).

Future studies should employ randomized controlled designs to evaluate the long-term effects of toothbrush bristle type on dentine hypersensitivity. Incorporating standardized brushing protocols, larger and more diverse populations, and comprehensive control for confounding variables would strengthen the evidence. Additionally, exploring the interplay between brushing force, frequency, and bristle stiffness could provide further insights into optimal toothbrush selection for dentine hypersensitivity prevention.

CONCLUSION

This systematic review emphasizes that the type of toothbrush bristle whether soft, medium, or hard does not significantly impact the risk of developing dentine hypersensitivity. Despite the common assumption that softer bristles are better for preventing this condition, the evidence suggests that bristle hardness plays a relatively minor role compared to other factors.

However, this conclusion should be interpreted with caution due to the limited number and methodological quality of the included studies. The findings highlight the need for more well designed clinical trials specifically evaluating bristle stiffness as a risk factor for dentine hypersensitivity.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest related to this study. No financial or personal relationships exist that could have influenced the research, analysis, or interpretation of the findings. The authors have no affiliations with any organizations or entities that could create a potential conflict of interest.

All authors have read and approved the final manuscript and confirm that the work is original and has not been published or submitted elsewhere.

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Table I. Main Characteristics and results of the Included studies.

Author, Year	**Country, Study Design**	**Sample Size, Male/Female, Mean Age ± SD**	**Assessment of Periodontal Adverse Events**	**Main Results**
Costa, 2014	Brazil, Cross-sectional	1023, 398/625, N/A±N/A	Prevalence of Dentine hypersensitivity	Dentine hypersensitivity Tested by Air: 35.6% among those using Soft toothbrush 32.7% among those using Medium/Hard toothbrush OR = 0.88 (95%CI: 0.57 to 1.35). Dentine hypersensitivity tested by Probe: 34.2% among those using Soft toothbrush 34.7% Medium/Soft among those using toothbrush OR = 1.02 (95%CI: 0.67 to 1.35).
Demirci, 2022	Turkey, Cross-sectional	1210, N/A, N/A, N/A±N/A	Prevalence of Dentine hypersensitivity	45% of the patients with dentine hypersensitivity used a soft toothbrush, 53% of the patients with dentine hypersensitivity used a medium toothbrush, 6% of the patients with dentine hypersensitivity used a hard toothbrush. (P = 0.197)
Author, Year	Country, Study Design	Sample Size, Male/Female,	Assessment of Periodontal Adverse Events	Main Results

		Mean Age ± SD		
Costa, 2014	Brazil, Cross-sectional	1023, 398/625, N/A±N/A	Prevalence of Dentine hypersensitivity	Dentine hypersensitivity Tested by Air: 35.6% among those using Soft toothbrush 32.7% among those using Medium/Hard toothbrush OR = 0.88 (95%CI: 0.57 to 1.35). Dentine hypersensitivity tested by Probe: 34.2% among those using Soft toothbrush 34.7% Medium/Soft among those using toothbrush OR = 1.02 (95%CI: 0.67 to 1.35).
Demirci, 2022	Turkey, Cross-sectional	1210, N/A, N/A, N/A±N/A	Prevalence of Dentine hypersensitivity	45% of the patients with dentine hypersensitivity used a soft toothbrush, 53% of the patients with dentine hypersensitivity used a medium toothbrush, 6% of the patients with dentine hypersensitivity used a hard toothbrush. (P = 0.197)

Table II. Risk of bias assessment for included studies.

Study	Clarity of Inclusion Criteria	Detail Presentation of Sample and Study Location	Valid and Reliable Exposure Measurement	Criteria or Measuring the Condition	Identification of Confounding Factors	Control of Confounding Factors	Criteria of Measuring the Outcome	Statistical Analysis	Risk of Bias
Costa 2014	Y	Y	U	Y	Y	Y	Y	Y	High
Demirci 2022	Y	Y	U	Y	Y	Y	N	Y	High

Table III. GRADE analysis of the included two studies examining the association of toothbrush bristle and dentine hypersensitivity.

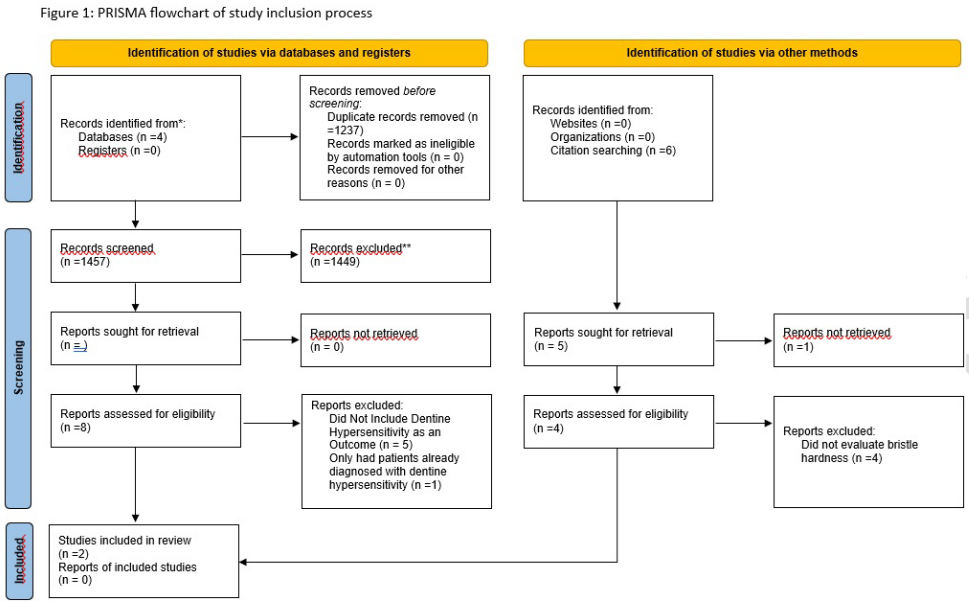
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Impact	Certainty	Importance
Dentine hypersensitivity (assessed with: Air/Probe)									
2	non-randomised studies	very serious[a]	not serious	not serious	serious[b]	none	These findings suggest that while the type of toothbrush bristle may not drastically affect Dentine hypersensitivity	⨁◯◯◯ Very low[a,b]	CRITICAL

Explanations

a. Both Studies have a high risk of bias.

b. The studies do not present significant association.

Figure 1.



Supplementary Table S1. Search strategies for all databases

Database	Search Strategy
PUBMED (n=1002)	#1 “Dentin Sensitivity”[Mesh] OR “Dentin Sensitivities” [tw] OR “Sensitivity, Dentin” [tw] OR Sensitivities, Dentin[tw] OR “Dentine Hypersensitivity” [tw] OR “Hypersensitivity, Dentine” [tw] OR “Dentine Sensitivity” [tw] OR “Sensitivity, Dentine” [tw] OR Hypersensitivities, Dentine[tw] OR Sensitivities, Dentine[tw] OR “Tooth Sensitivity”[tw] OR “Sensitivity, Tooth”[tw] OR “Dentin Hypersensitivities”[tw] OR “Hypersensitivity, Dentin”[tw] OR Sensitivities, Tooth[tw] OR Dentin Hypersensitivity[tw] #2 “Toothbrushing” [Mesh] OR toothbrushing[tw] OR toothbrush[tw] OR bristle[tw] OR bristles[tw] OR soft[tw] OR medium[tw] OR hard[tw] #3 #1AND #2
Web of Science (n=644)	#1 “Dentin Sensitivity” OR “Dentin Sensitivities” OR “Sensitivity, Dentin” OR Sensitivities, Dentin OR “Dentine Hypersensitivity” OR “Hypersensitivity, Dentine” OR “Dentine Sensitivity” OR “Sensitivity, Dentine” OR Hypersensitivities, Dentine OR Sensitivities, Dentine OR “Tooth Sensitivity” OR “Sensitivity, Tooth” OR “Dentin Hypersensitivities” OR “Hypersensitivity, Dentin” OR Sensitivities, Tooth OR Dentin Hypersensitivity #2 “Toothbrushing” OR toothbrush OR bristle OR bristles OR soft OR medium OR hard #3 #1AND #2
EMBASE (n=558)	#1 (((((‘dentin sensitivity’/exp OR ‘dentin sensitivity’ OR ‘dentin sensitivities’ OR ‘sensitivity, dentin’/exp OR ‘sensitivity, dentin’ OR sensitivities,) AND (‘dentin’/exp OR dentin) OR ‘dentine hypersensitivity’/exp OR ‘dentine hypersensitivity’ OR ‘hypersensitivity, dentine’ OR ‘dentine sensitivity’/exp OR ‘dentine sensitivity’ OR ‘sensitivity, dentine’ OR hypersensitivities,) AND (‘dentine’/exp OR dentine) OR sensitivities,) AND (‘dentine’/exp OR dentine) OR ‘tooth sensitivity’/exp OR ‘tooth sensitivity’ OR ‘sensitivity, tooth’ OR ‘dentin hypersensitivities’ OR ‘hypersensitivity, dentin’ OR sensitivities,) AND (‘tooth’/exp OR tooth) OR ‘dentin’/exp OR dentin) AND (‘hypersensitivity’/exp OR hypersensitivity) #2 ‘toothbrushing’/exp OR ‘toothbrushing’ OR ‘toothbrush’/exp OR toothbrush OR ‘bristle’/exp OR bristle OR bristles OR soft OR ‘medium’/exp OR medium OR hard #3 #1AND #2
SCOPUS (n=656)	((TITLE-ABS-KEY (toothbrushing) OR TITLE-ABS-KEY (toothbrush) OR TITLE-ABS-KEY (bristle) OR TITLE-ABS-KEY (bristles) OR TITLE-ABS-KEY (soft) OR TITLE-ABS-KEY (medium) OR TITLE-ABS-KEY (hard))) AND ((TITLE-ABS-KEY (dentin AND sensitivity) OR TITLE-ABS-KEY ("Dentin Sensitivities") OR TITLE-ABS-KEY ("Sensitivity, Dentin") OR TITLE-ABS-KEY ("Sensitivities, Dentin") OR TITLE-ABS-KEY ("Dentine Hypersensitivity") OR TITLE-ABS-KEY ("Hypersensitivity, Dentine") OR TITLE-ABS-KEY ("Dentine Sensitivity") OR TITLE-ABS-KEY ("Sensitivity, Dentine") OR TITLE-ABS-KEY ("Hypersensitivities, Dentine") OR TITLE-ABS-KEY ("Sensitivities, Dentine") OR TITLE-ABS-KEY ("Tooth Sensitivity") OR TITLE-ABS-KEY ("Sensitivity, Tooth") OR TITLE-ABS-KEY ("Dentin Hypersensitivities") OR TITLE-ABS-KEY ("Hypersensitivity, Dentin") OR TITLE-ABS-KEY ("Sensitivities, Tooth") OR TITLE-ABS-KEY ("Dentin Hypersensitivity")))