

What the dentists and the general population know about Dentin Hypersensitivity

O que os dentistas e a população em geral conhecem sobre Hipersensibilidade Dentinária

Lo que los Odontólogos y la población en general saben sobre la Hipersensibilidad Dentinaria

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Abstract

Aim: Dentin hypersensitivity (DH) is a health condition with variable prevalence rates, affecting a large portion of the population, especially young adults. This study aimed to verify the level of knowledge on the subject both of dentistry professionals and students and the general population. **Methodology:** An exploratory-descriptive study with quantitative analysis was carried out using a digital form released via social media to be filled in by the Google Forms tool. Four dimensions were evaluated regarding general characteristics and the presence of DH, as well as specific characteristics related to the group (dentists/dental students or general population). **Results:** The form was answered by 212 participants. Of these, 69% of the lay population claimed to frequently consume acidic foods and drinks, 35% claimed to have sensitive teeth and 30% self-indicated products for the treatment of DH. In relation to the group linked to dentistry, 46% did not know the difference between agents with obliterating and neural action; and 51% did not know the Hydrodynamic Theory. **Conclusion:** the population linked to dentistry showed a lack of knowledge about DH. The lay population, on the other hand, showed a superficial knowledge of DH, but with information acquired from informal sources.

Keywords: Dentin sensitivity; Surveys and questionnaires; Dentistry; Publications for science diffusion; Knowledge.

Resumo

Objetivo: A hipersensibilidade dentinária (HD) é um quadro de saúde com taxas de prevalência variáveis, acometendo grande parcela da população, especialmente adultos jovens. Este estudo avaliou o grau de conhecimento acerca do assunto, tanto de estudantes e profissionais da odontologia bem como da população em geral. **Metodologia:** Foi realizado um estudo exploratório-descritivo com análise quantitativa, por meio de um questionário estruturado e distribuído aos sujeitos da pesquisa via mídias sociais. As questões apresentadas e respondidas foram coletadas utilizando a ferramenta Google Forms. Foram avaliadas 4 dimensões sobre características gerais e presença de HD, bem como características específicas relativas ao público alvo. **Resultados:** O formulário foi respondido por 212 participantes. Os resultados mostraram que a maioria da população em geral (69%) consome alimentos e bebidas ácidas, afirmam ter dentes sensíveis (35%) e fazem uso de automedicação (30%). Relativo ao grupo ligado à odontologia 51% desconheciam conceitos básicos acerca da HD. **Conclusão:** O grau de conhecimento de graduandos/graduados em Odontologia, assim como da população em geral, é deficiente, exigindo estratégias educativas, no sentido de aperfeiçoar a formação profissional e a educação popular sobre HD.

Palavras-chave: Sensibilidade da dentina; Inquéritos e questionários; Odontologia; Publicações de divulgação científica; Conhecimento.

Resumen

Objetivo: La hipersensibilidad dentinaria (HD) es una condición de salud con tasas de prevalencia variables, que afecta a una gran parte de la población, especialmente a los adultos jóvenes. Este estudio tuvo como objetivo verificar el nivel de conocimiento sobre el tema tanto de los profesionales y estudiantes de odontología como de la población en general. **Metodología:** Se realizó un estudio exploratorio-descriptivo con análisis cuantitativo a través de un formulario digital difundido a través de las redes sociales para ser llenado mediante la herramienta Google Forms. Se evaluaron cuatro dimensiones en cuanto a las características generales y la presencia de HD, así como características específicas relacionadas con el grupo (odontólogos/estudiantes de odontología o población general). **Resultados:** El formulario fue respondido por 212 participantes. De estos, el 69% de la población no especializada afirmó consumir alimentos y bebidas ácidas con frecuencia, el 35% afirmó tener dientes sensibles y el 30% se auto indicaron productos para el tratamiento de la EH. Con relación al grupo vinculado a la odontología, el 46% desconocía la diferencia entre agentes con acción obliterante y neural; y el 51% no conocía la Teoría Hidrodinámica. **Conclusión:** la población vinculada a la odontología mostró un desconocimiento sobre HD. La población laica, por el contrario, mostró un conocimiento superficial de HD, pero con información adquirida de fuentes informales.

Palabras clave: Sensibilidad de la dentina; Encuestas y cuestionarios; Odontología; Publicaciones de divulgación científica; Conocimiento.

1. Introduction

The knowledge regarding predisposal factors to non-cariou lesions, from the point of view of clinicians, researchers and the general population are still tangential when compared to the historical highlight which was given to the study of carious lesions (Aminoshariae & Kulild, 2021; Pashley et al., 2008; Reshma et al., 2020). The etiology of non-cariou lesions is based on multifactorial conditions, represented by the isolated or synergic action of either chemical, mechanical, or frictional factors, in the absence of microorganisms. Furthermore, they can be modulated by the lifestyle, occlusion pattern, consume of acidic food, use of medications, presence of some medical conditions, among others (Grippio et al., 2012; Liu et al., 2020; Lussi & Carvalho, 2014; Pereira et al., 2021). The development and progression of the lesions often creates progressive tooth wear, resulting in dentin hypersensitivity (DH) (Alcântara et al., 2018; Pereira et al., 2021; Rocha et al., 2020).

The DH prevalence is known to range a great scope of variation, it changes based on cultural statistics, regional habits, and different diagnoses methods, indicating values between 1,3% through 98% in the wide world population. Particularly in the Brazilian population, the literature acknowledges to 17% until 46% (Baker et al., 2014; Favaro Zeola et al., 2019; Scaramucci et al., 2014). The DH is characterized by a transient chronic pain resulting from exposure of the dentinal tubules in the oral cavity, usually in response to tactile, thermal, chemical, or osmotic stimuli that cannot be explained by any other dental pathology (Dowell & Addy, 1983). Since pain is the main symptom of DH, it is reasonable to suppose that this condition is intrinsically connected with the quality of life. Moreover, the DH can develop biopsychosocial effects, causing nourish restrictions, social and aesthetics, badly inducing the wellbeing. (Baker et al., 2014; Douglas-De-Oliveira et al., 2018; Soares, 2020; Zeola et al., 2020).

Therefore, it is unequivocally the need to rate the level of knowledge of the population regarding DH. Likewise, it is relevant to estimate the dentist's knowledge concerning the DH etiology and treatment mechanisms, since there are several diagnoses methods and treatment options available in the scientific literature. Notwithstanding, studies are showing a lack of knowledge in the comprehension of DH for dentists. (Abuzinadah SH, 2021; Francisconi-dos-Rios et al., 2021; Kopycka-Kedzierawski et al., 2017; Oderinu et al., 2017; Zeola et al., 2020) Align with this, it is also important to analyze and discuss the knowledge of the general population about DH. Thus, the aim of this study was to investigate through an exploratory-descriptive study with quantitative analysis the information regarding the etiology and management of the HD by dentists/dental students and general population. The results of this study might help to offer options and create new strategies to mitigate the pain symptomatology, to control the etiological factors, and mainly emphasize the principles to prevent DH.

2. Methodology

2.1 Study Design and Ethical Aspects

This is an exploratory-descriptive study, with a quantitative approach, developed from 20/08/2021 until 06/10/2021. Approval was given by the local Ethics and Research Committee (approval number: CAAE 46982121.0.0000.8447) and attended the ethical and fundamental requirements foreseen in Resolution 466/2012 of the Health National Council (Research Standards involving Humans) ruled in Brazil.

2.2 Methodology and Procedures

It was developed a questionnaire by the researchers, based on the previous studies (Oderinu et al., 2017; Zeola et al., 2020) and organized in four dimensions, being them:

1. Free Informed Consent Form
2. Division of the studied population: the participants were divided into two groups, being them: population who was graduated or was under graduation in Odontology; and the population who is uneducated about odontology knowledge (general population).
3. Specifics questions about DH were applied over the group composed by undergraduate and graduates.
4. General questions about the theme were applied to the general population group.

The third or fourth dimensions were selected through a conditional question for the specific groups, redirecting to the respective questionnaire area. This area was divided into two branches: the academic/professional related to dentistry and the general people who were uneducated about odontology. The questionnaire was set in Portuguese, as this was the native language of the participants. The Google forms platform was selected to build the questionnaire and it disclosed through the authors social media, with random shots in the apps Whatsapp and Instagram. The questionnaire was also spread through the graduations and post-graduation students and patients attended in the faculty clinics. The inclusion criteria were sign free informed consent form, have more than 18 years old, accept the conditions proposed in the free informed consent form and answer all the questions over the questionnaire. All the questionnaires partially answered were excluded. At the end of each complete questionnaire, the participant gained the access to a link that contained an educative video about DH made by the authors of the study as an attempt to improve its knowledge about this condition.

2.3 Data Analysis

Data were analyzed using descriptive analysis procedures for all the answers. For this, the Google Forms sheets were exported to Excel and the data organized in charts and tables.

3. Results

The questionnaire was fully answered by 212 participants. From the second dimension of the questionnaire, the general information of the participants was obtained, and the descriptive analysis is presented in Table 1. Most of the participants were young adults up to 25 years old (42.9%), declared themselves as female (75%) and only 16% did not have higher education. Most of the participants declared to brush their teeth more of them 3 times/day (58%), which should be cautiously interpreted as may have been a biased answer since the study was conducted by dentists. Finally, most participants were previous users of

orthodontic devices and almost 35% presented tooth sensitivity, corroborating with previous epidemiological studies (Baker et al., 2014; Favaro Zeola et al., 2019; Scaramucci et al., 2014).

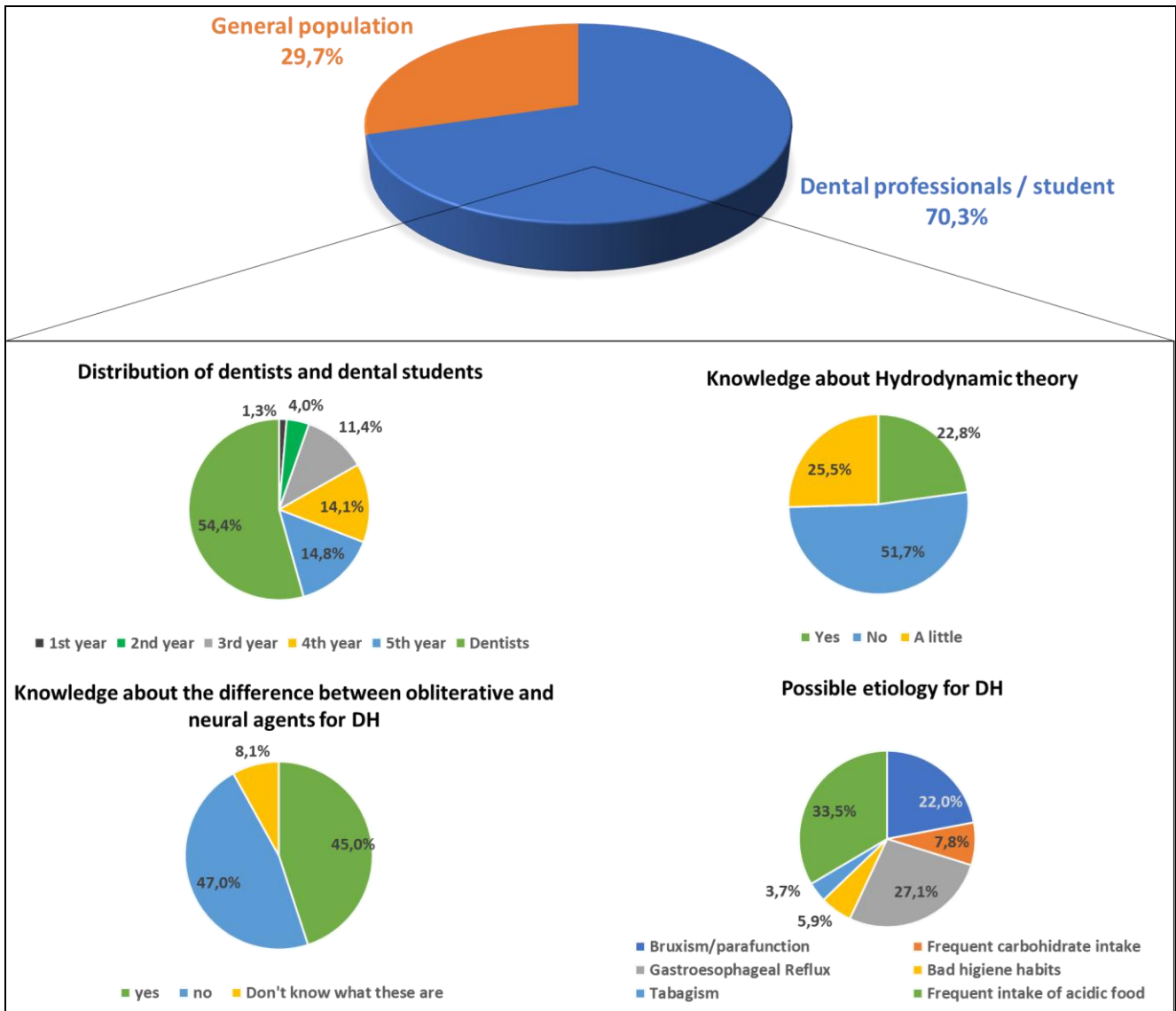
Table 1 – General characteristics of the participants.

	Participants (n)	%
Age (years old)		
18-25	91	42,9%
26-30	9	4,2%
31-35	15	7,1%
36-45	39	18,4%
> 45	58	27,4%
Gender		
male	53	25,0%
female	159	75,0%
other	0	-
Education level		
High School	34	16,0%
Higher education - incomplete	67	31,6%
Higher education - complete	111	52,4%
Dental hygiene - toothbrush/daily		
1	2	0,9%
2	42	19,8%
3	45	21,2%
>3	123	58,0%
Previous use of orthodontic devices		
yes	138	65,1%
no	74	34,9%
Presence of sensitive tooth		
yes	76	35,8%
no	136	64,2%

Source: Authors.

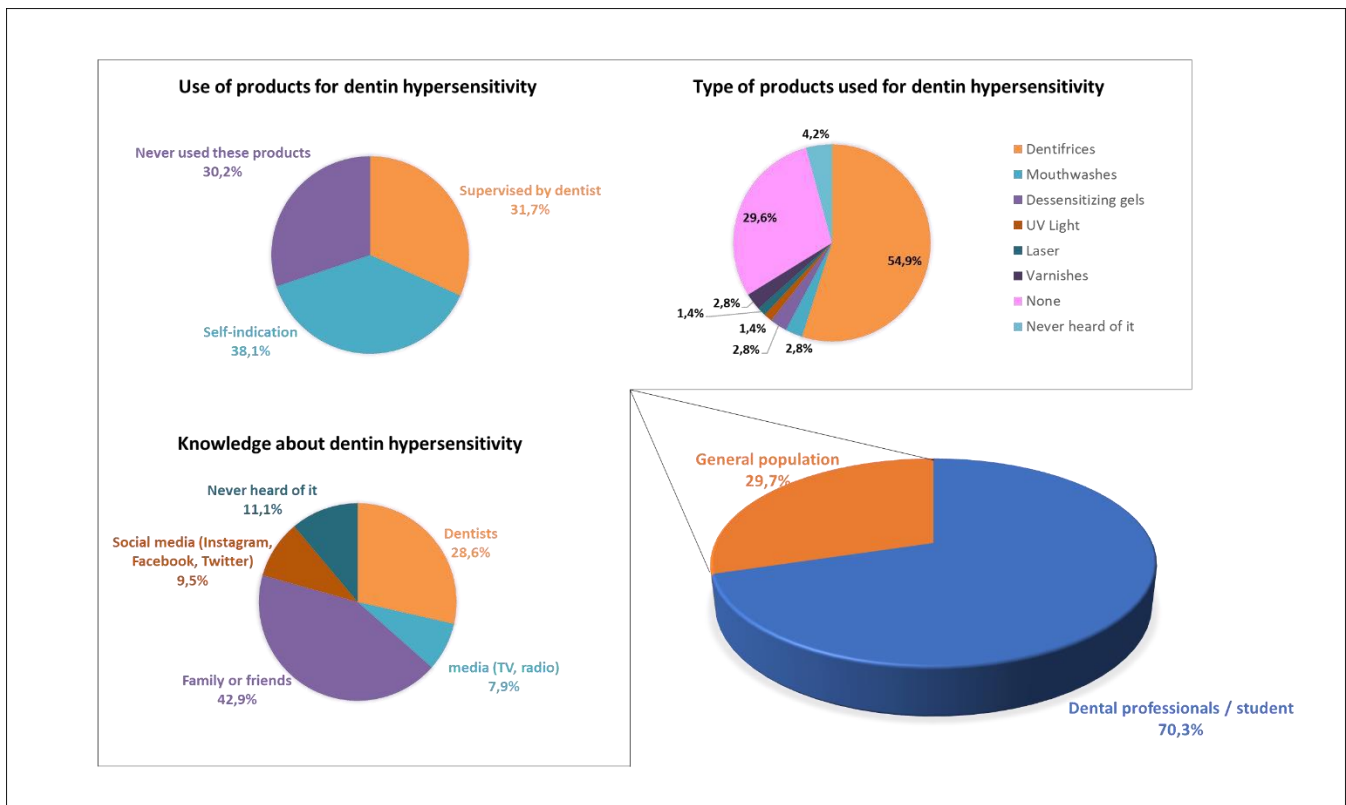
From the total group (212 participants), 149 were dentists or dental students (70.3%), and their distribution is presents in the chart of Figure 1. Regarding this group, the majority declared have no knowledge about the hydrodynamic theory, and most of them do not know the difference or even what are the oblitative or neural agents used for the management of dentin hypersensitivity. Also, frequent carbohydrate intake (7.8%) and bad hygiene habits, such as not correctly use the dental floss (5.9%), were described as possible causal factor of DH. Regarding the participants from the general population (29.7%), the descriptive analysis is shown in Figure 2. Only 28% of them heard about DH by the dentist, most of them that uses products for DH did not use supervised by dentists, and the preferred product is the dentifrice.

Figure 1 – Distribution and qualitative analysis of the dental professionals evaluated.



Source: Authors.

Figure 2 – Distribution and qualitative analysis of the general population evaluated.



Source: Authors.

4. Discussion

Pain is one of the most common symptoms of DH, and is frequently associated with limitation of oral functions and negatively affects the quality of life of individuals (Bekes & Hirsch, 2013; Douglas-de-Oliveira et al., 2018; Douglas de Oliveira et al., 2013; Goh et al., 2016; Lima et al., 2017; Porritt et al., 2016). Regarding this theme, the scientific literature has notified a lack of knowledge of the dentist about etiology and management, and a greater gap when among the general population. The results found in this study corroborate with that, showing a relative gap of knowledge of the odontology population, and the uneducated general population. Furthermore, the knowledge from this last group isn't from orientation or education to oral health promoted by dental professionals, showing that this community needs to improve communication with their patients and their community. This is clear in Figure 2, where almost 89% of the participants from the general population claim to know about the existence of DH, but the source of information came from relatives/friends and social media (43% and 8% respectively), and only 29% had information directly from the Dentist. This scenario points to the need for more active participation of the Dentist in this debate. In this way, the professional would prevent the population from receiving information exclusively non-academic related, which is not always trustworthy and enlightening. This situation is endorsed by the fact that 55% of the population uses dentifrices recommended for sensitive teeth, not knowing that despite its low cost, its actuation is for a short period and as a palliative option.

Still concerning the uneducated population is meaningful the relation between self-care; of which 58,2% reported to perform oral hygiene, but 69,8% admit to consuming acidic foods and drinks. Although, 64,3% don't report pain symptomatology the previous numbers show that the symptoms might yet not be developed, as most of the participants was under 30 years (Table 1). The identification of risk factors shall be identified by the dentist and preventive measures can be incorporated to the patient lifestyle and habits to avoid or delay the appearance of DH (Pereira et al., 2021).

Another curious factor was that 65% of the participants already had been submitted to orthodontics treatment (Table 1). It is important to highlight that an acidic diet associated with the orthodontic treatment can, eventually, act as a modifier factor to the development of DH. It is suggested that the orthodontic treatment generate gum retraction which is responsible for the exposure of the dentinal tubules, also the high ingestion of acidic drinks and foods contribute to an increase of erosive wear in this region (Jati et al., 2016; Liu et al., 2020). Besides, orthodontic movements can induce tensile stresses in the cervical enamel, generating microfractures and microcracks, making it more permeable to acids and fluids that results in DH.

Among the theories that explain the action mechanisms which provoke pain in the DH, the most acceptable is the hydrodynamic theory proposed by Brannstrom worldwide accepted as the mechanism of pain from DH (Dowell & Addy, 1983; West et al., 2014). It advocates that external stimuli incite the dentinal fluid flow, exciting the nerve fibers, and consequently causing pain (Brännström, 1964). Two main approaches are usually followed as treatments options: chemical or physical dentinal tubule occlusion and/or nerve desensitization (Mantzourani & Sharma, 2013; Sgreccia et al., 2020). Clinical protocols usually associates a large variety of products and application periods comprising both approaches (Machado et al., 2018; Marto et al., 2019; Sgreccia et al., 2020; Wang et al., 2016), while a recent metanalysis suggested that the association of tubule occlusion and neural desensitization provides the best outcomes (Moraschini et al., 2018). From the results of our survey, it is concerning that most dentists or undergraduates don't have knowledge or have only superficial knowledge about this theory. Similar results were found in previous studies (Oderinu et al., 2017; Ribeiro et al., 2016). The absence of knowledge regarding the basic mechanism of DH might be responsible to the difficult regarding the management of this condition and even its' diagnose. Likewise, it is perceptible the gap of knowledge concerning desensitizing agents, classically approached in the daily clinical practices. Most of the odontology group didn't know the difference between obliterating agents, which are those that seal the dentinal tubules and stop the dentinal fluid flow, and the neural agents, which are those that act depolarizing the nerve fibers, blocking the transmission of pain signals (Ribeiro et al., 2016).

The survey was made thought virtual forms sent thought instant message app (Whatsapp) or social media (Instagram) given the facility and agility to reach a considerable amount of people. Although, this fact can be a study limitation, given the possibility of the messages being filed or even ignored, what can reduce the number of participants. Despite the advantages of using the virtual environment for research, a possible limitation of the present study may have been the lack of characterization of the target audience in dentistry students/dentists and general population.

However, this limitation can be reduced by the fact that the virtual environment provides the participant with anonymity status, which invariably allows sincere and trustworthy answers. This was a preliminary study to assess if there was lack of knowledge regarding this theme among dental students and dentists, and the general population. An educative video (link: <https://youtu.be/TLxUZl8Wcqq>) was created to highlight the main mechanism, etiology, and preventive measures regarding this condition, and was made available to the participants, and in the faculty clinics as an attempt to educate future dentists and patients in general. Future studies should delve into understanding and educational deficiencies and better ways to bring the information to the general community.

5. Conclusion

Grounded by the results found in this study is possible to conclude that the dentists and dental students lacks knowledge concerning DH, especially about the relationship between pain and the mechanism of action of the desensitizing agents. The uneducated population is warned of DH and search information about this in social media and in lower scale with the group comprised by dentists and dental students.

References

- Abuzinadah, S. H. A. A. (2021). A randomized clinical trial of dentin hypersensitivity reduction over one month after a single topical application of comparable materials. *Sci Rep.*, 11(1), 6793.
- Alcântara, P. M., Barroso, N. F. F., Botelho, A. M., Douglas-de-Oliveira, D. W., Gonçalves, P. F., & Flecha, O. D. (2018). Associated factors to cervical dentin hypersensitivity in adults: a transversal study. *BMC Oral Health*, 18, 155.
- Aminoshariae, A., & Kulild, J. C. (2021). Current Concepts of Dentinal Hypersensitivity. *J Endod.*, 44(11), 1696–1702.
- Baker, S. R., Gibson, B. J., Sufi, F., Barlow, A. P. S., & Robinson, P. G. (2014). The dentine hypersensitivity experience questionnaire (DHEQ): A longitudinal validation study. *Dentine Hypersensitivity: Developing a Person-Centred Approach to Oral Health*, 41(1), 52–59. <https://doi.org/10.1016/B978-0-12-801631-2.00009-9>
- Bekes, K., & Hirsch, C. (2013). What is known about the influence of dentine hypersensitivity on oral health-related quality of life? *Clinical Oral Investigations*, 17(S1), 45–51. <https://doi.org/10.1007/s00784-012-0888-9>
- Brännström, M. (1964). Dentinets sensibilitet [Dentin sensitivity]. *Arsb Goteb Tandlak Sallsk*, 15–35.
- Douglas-De-Oliveira, D. W., Lages, F. S., Paiva, S. M., Cromley, J. G., Robinson, P. G., & Cota, L. O. M. (2018). Cross-cultural adaptation of the Brazilian version of the Dentine Hypersensitivity Experience Questionnaire (DHEQ-15). *Braz Oral Res.*, 32, e37.
- Douglas-de-Oliveira, D. W., Vitor, G. P., Silveira, J. O., Martins, C. C., Costa, F. O., & Cota, L. O. M. (2018). Effect of dentin hypersensitivity treatment on oral health related quality of life — A systematic review and meta-analysis. *Journal of Dentistry*, 71, 1–8. <https://doi.org/10.1016/j.jdent.2017.12.007>
- Douglas de Oliveira, D. W., Marques, D. P., Aguiar-Cantuária, I. C., Flecha, O. D., & Gonçalves, P. F. (2013). Effect of Surgical Defect Coverage on Cervical Dentin Hypersensitivity and Quality of Life. *Journal of Periodontology*, 84(6), 768–775. <https://doi.org/10.1902/jop.2012.120479>
- Dowell, P., & Addy, M. (1983). Dentine hypersensitivity - A review. Aetiology, symptoms and theories of pain production. *Journal of Clinical Periodontology*, 10(4), 341–350. <https://doi.org/10.1111/j.1600-051X.1983.tb01283.x>
- Favaro Zeola, L., Soares, P. V., & Cunha-Cruz, J. (2019). Prevalence of dentin hypersensitivity: Systematic review and meta-analysis. *Journal of Dentistry*, 81, 1–6. <https://doi.org/10.1016/j.jdent.2018.12.015>
- Francisconi-dos-Rios, L. F., Calabria, M. P., Pereira, J. C., Hatton, J., Honório, H. M., Wang, L., & Gillam, D. G. (2021). Knowledge of Brazilian dentists and students in treating dentine hypersensitivity. *Research, Society and Development.*, 10(9), e28010917194.
- Goh, V., Corbet, E. F., & Leung, W. K. (2016). Impact of dentine hypersensitivity on oral health-related quality of life in individuals receiving supportive periodontal care. *Journal of Clinical Periodontology*, 43(7), 595–602. <https://doi.org/10.1111/jcpe.12552>
- Grippio, J. O., Simring, M., & Coleman, T. A. (2012). Abrfraction, abrasion, biocorrosion, and the enigma of noncarious cervical lesions: a 20-year perspective. *J Esthet Restor Dent*, 24(1), 10–23. <https://doi.org/10.1111/j.1708-8240.2011.00487.x>
- Jati, A. S., Furquim, L. Z., & Consolaro, A. (2016). Gingival recession: its causes and types, and the importance of orthodontic treatment. *Dental Press J Orthod.*, 21(3), 18–29.
- Kopycka-Kedzierawski, D. T., Meyerowitz, C., Litaker, M. S., Chonowski, S., Heft, M. W., Gordan, V. V., Yardic, R. L., Madden, T. E., Reyes, S. C., Gilbert, G. H., & Group, N. D. P. C. (2017). Management of Dentin Hypersensitivity by National Dental Practice-Based Research Network practitioners: results from a questionnaire administered prior to initiation of a clinical study on this topic. *BMC Oral Health.*, 17(1), 41.
- Lima, T. C., Vieira-Barbosa, N. M., Grasielle de Sá Azevedo, C., de Matos, F. R., Douglas de Oliveira, D. W., de Oliveira, E. S., Ramos-Jorge, M. L., Gonçalves, P. F., & Flecha, O. D. (2017). Oral Health-Related Quality of Life Before and After Treatment of Dentin Hypersensitivity With Cyanoacrylate and Laser. *Journal of Periodontology*, 88(2), 166–172. <https://doi.org/10.1902/jop.2016.160216>
- Liu, X., Tenenbaum, H., Wilder, R., Quock, R., Hewlett, E. R., & Ren, Y.-F. (2020). Pathogenesis, diagnosis and management of dentin hypersensitivity: an evidence-based overview for dental practitioners. *BMC Oral Health*, 20, 220.
- Lussi, A., & Carvalho, T. S. (2014). Erosive tooth wear: A Multifactorial condition of growing concern and increasing knowledge. *Monographs in Oral Science*. <https://doi.org/10.1159/000360380>
- Machado, A. C., Viana, Í. E. L., Farias-Neto, A. M., Braga, M. M., de Paula Eduardo, C., de Freitas, P. M., & Aranha, A. C. C. (2018). Is photobiomodulation (PBM) effective for the treatment of dentin hypersensitivity? A systematic review. *Lasers in Medical Science*, 33(4), 745–753. <https://doi.org/10.1007/s10103-017-2403-7>
- Mantzourani, M., & Sharma, D. (2013). Dentine sensitivity: Past, present and future. *Journal of Dentistry*, 41(SUPPL. 4), S3–S17. [https://doi.org/10.1016/S0300-5712\(13\)70002-2](https://doi.org/10.1016/S0300-5712(13)70002-2)
- Marto, C. M., Baptista Paula, A., Nunes, T., Pimenta, M., Abrantes, A. M., Pires, A. S., Laranjo, M., Coelho, A., Donato, H., Botelho, M. F., Marques Ferreira, M., & Carrilho, E. (2019). Evaluation of the efficacy of dentin hypersensitivity treatments—A systematic review and follow-up analysis. *Journal of Oral Rehabilitation*, joor.12842. <https://doi.org/10.1111/joor.12842>
- Moraschini, V., da Costa, L. S., & dos Santos, G. O. (2018). Effectiveness for dentin hypersensitivity treatment of non-carious cervical lesions: a meta-analysis. *Clinical Oral Investigations*, 22(2), 617–631. <https://doi.org/10.1007/s00784-017-2330-9>
- Oderinu, O. H., Sede, M. A., Oginni, A. O., Cyril, I., Adegbulugbe, Uti, O. G., Olusile, A. O., Udoye, C. I., & Savage, K. O. (2017). Knowledge, diagnosis and management of dentine hypersensitivity: a national survey of dentists in Nigeria. *Int Dent J.*, 67(5), 287–293.

- Pashley, D. H., Tay, F. R., Haywood, V. B., Collins, M. A., & Drisko, C. L. (2008). Dentin Hypersensitivity: Consensus-Based Recommendations for the Diagnosis and Management of Dentin Hypersensitivity. *Inside Dent*, 4(9), 1–40.
- Pereira, M. L. D., Silva, R. C. B. da, Augusto, C. de A. F., Fort, A. C., Moura, R. de M. e, Liporoni, P. C. S., & Zanatta, R. F. (2021). Social, nutritional, and behavioral aspects associated with erosive tooth wear - considerations and preventive aspects. *Research, Society and Development*, 10(1), e37310111897. <https://doi.org/10.33448/rsd-v10i1.11897>
- Porritt, J. M., Sufi, F., & Baker, S. R. (2016). Utilising daily diaries to examine oral health experiences associated with dentine hypersensitivity. *BMC Oral Health*, 16(1), 97. <https://doi.org/10.1186/s12903-016-0286-9>
- Reshma, S. A., Masthan, K. M. K., Babu, N. A., & Anitha, N. (2020). Dentinal Hipersensitivity. *European Journal of Molecular & Clinical Medicine*, 7(3), 1752–1760.
- Ribeiro, P. J. T., Araújo, A. M. P. de, Mafra, R. P., Vasconcelos, M. G., & Vasconcelos, R. G. (2016). Mecanismos de ação dos recursos terapêuticos disponíveis para o tratamento da hipersensibilidade dentinária cervical. *Odontol. Clín.-Cient.*, 15(2), 83–90.
- Rocha, M. O. C., Cruz, A. A. C. F., Santos, D. O., Douglas-de_Oliveira, D. W., Flecha, O. D., & Gonçalves, P. F. (2020). Sensitivity and specificity of assessment scales of dentin hypersensitivity – an accuracy study. *Brazilian Oral Research*, 34, e043.
- Scaramucci, T., de Almeida Anfe, T. E., da Silva Ferreira, S., Frias, A. C., & Sobral, M. A. P. (2014). Investigation of the prevalence, clinical features, and risk factors of dentin hypersensitivity in a selected Brazilian population. *Clinical Oral Investigations*, 18(2), 651–657. <https://doi.org/10.1007/s00784-013-1008-1>
- Sgreccia, P. C., Barbosa, R. E. S., Damé-Teixeira, N., & Garcia, F. C. P. (2020). Low-power laser and potassium oxalate gel in the treatment of cervical dentin hypersensitivity—a randomized clinical trial. *Clinical Oral Investigations*, 24(12), 4463–4473. <https://doi.org/10.1007/s00784-020-03311-7>
- Soares, A. R. dos S. (2020). Prevalência e gravidade de lesões cervicais não cariosas e hipersensibilidade dentinária: associação com qualidade de vida entre adultos [Universidade Federal de Minas Gerais]. <http://hdl.handle.net/1843/34981>
- Wang, L., Magalhães, A. C., Francisconi-Dos-Rios, L. F., Calabria, M. P., Araújo, D. F. G., Buzalaf, M. A. R., Lauris, J. R. P., & Pereira, J. C. (2016). Treatment of dentin hypersensitivity using nano-hydroxyapatite pastes: A randomized three-month clinical trial. *Operative Dentistry*. <https://doi.org/10.2341/15-145-C>
- West, N., Seong, J., & Davies, M. (2014). Dentine Hypersensitivity. In *Monogr Oral Sci* (Vol. 25, pp. 108–122). <https://doi.org/10.1159/000360749>
- Zeola, L. F., Teixeira, D. N. R., Galvão, A. da M., Souza, P. G., & Soares, P. V. (2020). Brazilian dentists' perception of dentin hypersensitivity management. *Braz Oral Res.*, 33, 115.