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## Dentin Hypersensitivity among the medical and non-medical staff of a Hospital Population - A questionnaire-based survey

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**Abstract:** Dentinal hypersensitivity (DH) is a common clinical condition usually associated with exposed dentin surfaces, dental pain which is sharp in character and of short duration, arising from exposed dentin surfaces in response to stimuli, typically thermal, evaporative, tactile, osmotic, chemical or electrical; and which cannot be ascribed to any other dental disease. It can affect patients of any age group and most commonly affects the canines and premolars of both the arches. This study aims to assess the prevalence of dentin hypersensitivity among a hospital population in order to assess the causes, preventive measures and awareness about dentin hypersensitivity among the medical and non-medical professionals in a hospital. There are many factors that cause dentin hypersensitivity including tooth brushing practices, brushing materials, diet and oral hygiene practices. A survey with questionnaires regarding brushing practices, dietary habits, oral hygiene was distributed among medical and non-medical workers in the hospital. The results show that 44.3% experienced dentin hypersensitivity whereas 55.7% did not experience dentin hypersensitivity. 73.2% used moderate pressure while brushing their teeth. A lower prevalence of dentin hypersensitivity was found as the population of the hospital have been practising accurate oral hygiene practices which includes the food habits, brushing pressure and selection of toothpaste. Reduction in prevalence of hypersensitivity is achieved when too hot or too cold, acidic substances come in contact with tooth surface.

**Keywords:** dentin hypersensitivity, food habits, brushing, practices, toothpaste.

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### INTRODUCTION

Dentine hypersensitivity is a pain that is sharp and sudden, in response to an external stimulus (Liu, Lan and Hsieh, 1998). The most common trigger is cold, 75% of people with hypersensitivity reporting pain upon application of a cold stimulus. (Ikola, 2001; Gillam, 2015; Gillam and Koyi, 2020). Other types of stimuli may also trigger pain in dentin hypersensitivity, include: Thermal, electrical, mechanical, osmotic, evaporation, chemicals (Robinson, 2014; Kiselnikova and Romanovskaya, 2020). The main cause of DH is gingival recession (receding gums) with exposure of root surfaces, loss of the cementum layer and smear layer, and tooth wear (Taha and Clarkson, 2014; Kasaj, 2018). Receding gums could be a sign of trauma from excessive or forceful toothbrushing, or brushing with an abrasive toothpaste (dental abrasion), or a sign of chronic periodontitis (gum disease) (Oginni *et al.*, 2008). Other less common causes are acid erosion (e.g. related to gastroesophageal reflux disease, excessive consumption of acidic foods and drinks) (Carneiro and Minja, 2020). Dentine contains many microscopic tubular structures that radiate outwards from the pulp; these are typically 0.5–2 micrometres in diameter. Hydrodynamic flow can be increased by cold, air pressure, drying, sugar, sour (dehydrating chemicals), or forces acting on the tooth. Hot or cold food or drinks, and physical pressure are typical triggers in those individuals with teeth sensitivity (Oginni, Bamise and Olusile, 2008; Oderinu *et al.*, 2017; Savage *et al.*, 2019). The diagnosis of the disease starts through investigating the medical history of the patient and examination. In investigating the medical history some questions are asked about the time of the start of DH, the intensity of the pain, the stability of the pain and the factors that reduce or increase the intensification of the disease. (Cunha-Cruz *et al.*, 2013) (Padavala and Sukumaran, 2018)

In examination, some techniques such as pure air, pure water, and sounds are used in order to reconstruct the stimulating factors and to determine the degree of pain of the patient. Some other diagnostic tests are as follows: palpitation for diagnosing pulpitis or periodontal involvement, pushing a wood stick or transillumination for diagnosing a fracture or cracked tooth. All of the teeth with pain should be examined and the degree of pain

should be described through qualitative parameters such as slight, medium, and severe pain or through using quantitative parameters such as visual analogue scale. Eventually, all the characteristic data obtained from patient's medical history and clinical examination can help to assess DH while ruling out all other causes of the pain. (Cunha-Cruz *et al.*, 2010, 2013)

Studies have demonstrated that using sealers and restoration to reduce dentin hypersensitivity has been effective in the short term. Using toothpaste is also effective but for long term use over 6 months. Gingival recession and cervical tooth wear can be avoided by healthy dietary and oral hygiene practices. Excessive use of acidic conditions around the teeth should be avoided by limiting consumption of acidic foods and drinks, and seeking medical treatment for any cause of regurgitation/reflux of stomach acid. Importantly, the teeth should not be brushed immediately after acidic foods or drinks. A non-abrasive diet will also help to prevent tooth wear. Home treatments include desensitizing toothpastes or dentifrices, potassium salts, mouthwashes and chewing gums (Walters, 2005; 'Dentinal Hypersensitivity: A Question Of Comfort', 2010). Studies have found that mouthwashes containing potassium salts and fluorides can reduce dentine hypersensitivity. (Abitha and Santhanam, 2019) Many studies done in relation to teeth and the effects of oral health on various tooth related disorders [(Gunasekaran and Abilasha, 2016) ('Krishnan RP, Ramani P, Sherlin HJ, Sukumaran G, Ramasubramanian A, Jayaraj G, et al. Surgical Specimen Handover from Operation Theater to Laboratory: A Survey. *Ann Maxillofac Surg* 2018;8:234–8. [https://doi.org/10.4103/ams.ams\\_51\\_18](https://doi.org/10.4103/ams.ams_51_18)', no date) (*Website*, no date a) (*Website*, no date b) (*Website*, no date c) (*Website*, no date d) have lead us to conduct the present study on a hospital population. This study aims to assess the prevalence of dentin hypersensitivity among a hospital population in order to assess the causes, preventive measures and awareness about dentin hypersensitivity among the medical and non-medical professionals in a hospital. Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J *et al.*, 2018; Menon *et al.*, 2018; Prabakar *et al.*, 2018; Rajeshkumar *et al.*, 2018, 2019; Vishnu Prasad *et al.*, 2018; Wahab *et al.*, 2018; Dua *et al.*, 2019; Duraisamy *et al.*, 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu *et al.*, 2019; Mehta *et al.*, 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran *et al.*, 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma *et al.*, 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi *et al.*, 2020; Samuel, Acharya and Rao, 2020)

## MATERIAL AND METHODS

An online survey was done on a hospital population of 98 people. The questionnaire included brushing practices, dietary habits, hygiene practices, toothpaste selection and hypersensitivity prevalence. The results and trigger factors were assessed. The people were asked to mark the most appropriate answer without any prompting by the surveyor.

## RESULTS AND DISCUSSION

The results are depicted in the figure (Fig1-6). The diagnosis of dentin hypersensitivity has to be a differential one and requires elimination of potential sources of pain such as cracked tooth syndrome, fractured restorations, or caries. (Naik, Byakod and Muglikar, 2012; Garcia *et al.*, 2017) If the pain from exposed dentin is elicited by certain stimuli (e.g. cold, sweet, hot etc.), and in the absence of other causative factors, a diagnosis of dentin hypersensitivity can be made (Pretha, Setty and Ravindra, 2006). According to the results of the study 59.2% of the people about the age of 40. 62.2% of the people do not floss their teeth 63.3% of the people visit their dentist only when the situation demands 49.8% of the people use herbal toothpaste. 73.2% of the people use moderate pressure while brushing their teeth. 69.8% of the people use medium soft bristled toothbrushes. 49% of the people experience moderate pain when their teeth gets in contact with too hot/cold, acidic food. 43.9% of the people are mostly exposed to sugary food. 55.7% of the people did not experience dentine hypersensitivity, which shows that 44.3% of the people experienced dentin hypersensitivity. Out of the 44.3% who experienced dentin hypersensitivity, 75% used desensitising toothpaste. From further findings it is found that out of the 75% who used desensitising toothpaste, 33% felt the desensitising toothpaste had given them relief, whereas 33% felt the desensitising toothpaste did not give any sort of relief, another 33% felt the desensitising toothpaste gave relief only sometimes. The results show that a lesser population of the people who had taken the survey had dentin hypersensitivity which can be related to their food habits, brushing pressure, type of toothbrush used, and mainly the type of food exposed to. A study by JS Rees on the prevalence of dentin hypersensitivity in a hospital clinic in HongKong showed prevalence of 67.7%. The study showed that the common factor initiating dentin hypersensitivity was cold drinks (Rees *et al.*, 2003). A survey on a teaching hospital population in Nigeria also showed similar results as the prevalence of dentin hypersensitivity was 34.6%. The reason for the lower prevalence in these studies was the lesser exposure to acidic and cold substances and mainly the brushing pressure which was found to be moderate. A study by Guntipalli M Naidu on prevalence of dentine hypersensitivity among patients visiting a dental school in andhra Pradesh showed that the overall prevalence of DH was found to be 32%. The most common cause was consuming cold food or drinks (92%) and common

predisposing factor was gingival recession (28%). The results of our study are similar to Sood S et al, survey as prevalence of hypersensitivity in the population was low. (Sood *et al.*, 2016) Our institution is passionate about high quality evidence based research and has excelled in various fields ( (Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Vijayashree Priyadharsini, Smiline Giriya and Paramasivam, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Chandrasekar *et al.*, 2020; Mathew *et al.*, 2020; R *et al.*, 2020; Samuel, 2021)

## CONCLUSION

A lower prevalence of dentin hypersensitivity(44.3%) was found as the population of the hospital have been practising accurate oral hygiene practices which includes the food habits, brushing pressure and selection of toothpaste. Reduction in prevalence of hypersensitivity is achieved when too hot or too cold, acidic substances do not come in contact with tooth surfaces. Patients need to brush twice daily with toothpaste. Another option is to recommend a toothpaste containing a desensitizing agent, for example, Colgate Sensitive. There are also several desensitizing agents that are easily applied in-office to sensitive areas. A no-injection procedure is more pleasant for patients and makes it easy to apply the agents at recall appointments. Other options include lasers, resin-based materials and gingival grafts, which are more involved. Typically, a desensitizing home-use product is a first-line and successful option. It's important to encourage patients to keep up with regular appointments, limit sensitivity-causing foods and activities and use a soft-bristled toothbrush. It is also necessary to check the patient's brushing technique, as dentin hypersensitivity can also be caused by brushing the teeth and gums with too much force. Dentin hypersensitivity affects the enjoyment of daily activities and quality of life, and many patients aren't aware that it is a manageable condition

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## CONFLICT OF INTEREST

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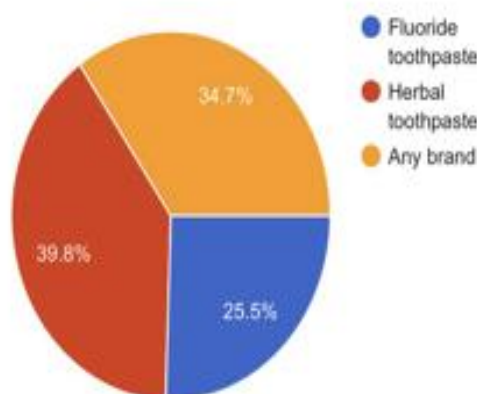
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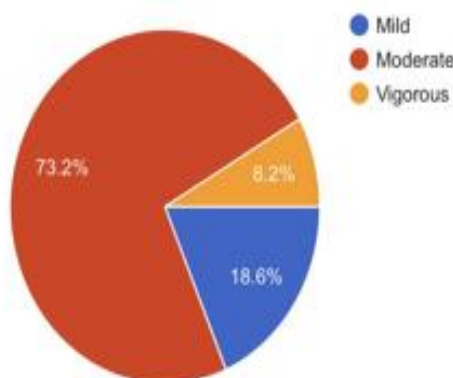
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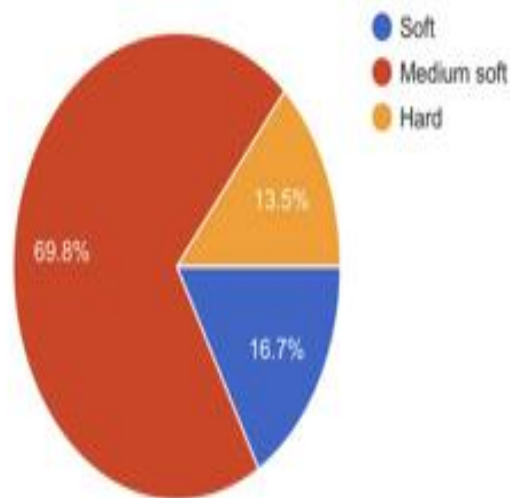
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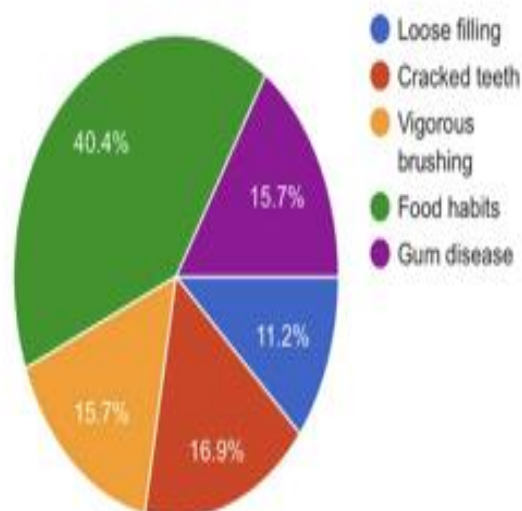
**Figure 1: shows that 39.8% of the people use herbal toothpaste, 25.5% of the people use fluoride toothpaste and 34.7% of the people use any nonspecific variety.**



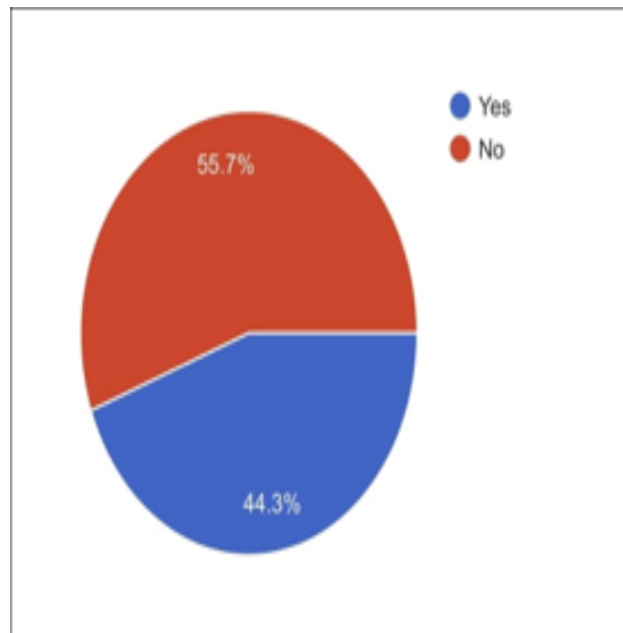
**Figure 2 shows that 73.2% of the people use moderate pressure while brushing their teeth, 18.6% use mild pressure while brushing their teeth and 8.2 % use vigorous force while brushing teeth.**



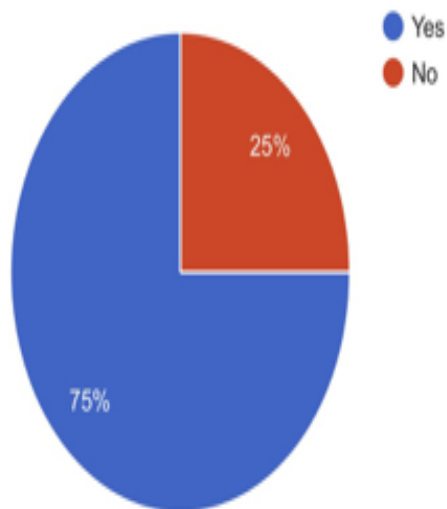
**Figure 3 shows that 69.8% of the people use medium soft bristled toothbrush, 16.7% of the people use soft bristled toothbrush and 13.5% of the people use hard bristled toothbrush**



**Figure 4 shows that 40.4% of the people think their sensitivity is due to food habits.15.7% of the people think the sensitivity is because of vigorous brushing, 16.9% of the people think that their sensitivity is due to cracked teeth, 15.7% think that their sensitivity is due to any gum disease and 11.2% of the people think that their sensitivity is due to loose filling in any previous dental procedure.**



**Figure 5 shows that the prevalence of dentine hypersensitivity among the hospital population was 44.3%. This shows that 55.7% of the people did not experience dentine hypersensitivity.**



**Figure 6 shows that out of the 44.3% of the population who had tooth sensitivity, 75% of the people used desensitising toothpaste.**