



Exploring the Impact of Essential Tremors on Work Precision among Dental Professionals in Tamil Nadu: A Prevalence Study

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Abstract

This study aims to determine the prevalence of essential tremors among dental professionals in Tamil Nadu and assess their impact on the perfection of work. A cross-sectional study was conducted using a self-validated questionnaire comprising 9 closed-ended and open-ended questions. The study included 120 practicing dental professionals aged 25 to 50 years in Tamil Nadu, India, selected through a stratified random sampling method. Statistical analysis was performed using descriptive statistics and Chi-square tests, with a significance level of $p < 0.05$. There was a statistically significant association was found with working experience and medication. Given that dentistry involves precision work, essential tremors present a foundtaining quality care. Dentists are susceptible to various occupational hazards and the presence of hand tremors may compromise patient safety. Etiological factors associated with tremors should be investigated and appropriate management strategies should be implemented to ensure dentists medical fitness for practice, thereby maintaining patient confidence and comfort.

Keywords: Essential tremors, Dental professionals, Perfection of work, Lifestyle changes

Short communication

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1. Introduction

Essential Tremor is a benign, familial, monosymptomatic neurological disorder characterized by involuntary rhythmic shaking of various parts of the body [1]. Studies have shown that drugs like Propranolol can decrease essential tremor by around 20%, while Deep Brain Stimulation (DBS) in the thalamic nucleus ventro intermedium can reduce it by up to 90%. However, many individuals discontinue treatment due to poor efficacy or side effects associated with the treatments [2]. Essential tremor is genetically inheritable and studies indicate that tremor distribution follows a bimodal pattern around the age of 15 years. The severity of arm tremors assessed using the Archimedes scale suggests that tremors tend to increase with advancing age and the duration of tremors. Both men and women are affected in equal proportions by essential tremor [3]. In the army, females have been observed to exhibit greater hand steadiness compared to males, which may be

indirectly linked to their lifestyle choices and training regimens [4]. It is typically inherited in an autosomal dominant pattern [5]. Additionally, tremors can be induced after alcohol consumption [6]. Studies have shown that approximately 19.2% of individuals with Essential Tremor also have Parkinson's disease [7].

The impact of essential tremors on daily activities such as drinking, handwriting and eating is well-documented [8]. Additionally, repetitive movements like typing can lead to conditions such as Carpal Tunnel Syndrome [9]. Recent findings in the United States suggest that dentists may be at risk of occupational mercury exposure during amalgam fillings, which can increase tremor frequency due to mercury vapor exposure [10-11]. This occupational hazard, along with chronic exposure to toxic compounds, may contribute to the development of essential tremors in dentists, with literature indicating that approximately 28.5% of affected individuals also develop associated factors of Parkinson's disease [12]. A case study

involving a dentist with hand tremors successfully treated with Deep Brain Stimulation further underscores the importance of addressing essential tremors in dental practice [13]. Therefore, this study aims to the Impact of Essential Tremors on Work Precision among Dental Professionals in Tamil Nadu.

2. Materials and Methods

A questionnaire-based cross-sectional study was conducted among dental surgeons practicing in various districts of Tamil Nadu, India. The stratified random sampling method was employed, with four districts initially selected randomly, followed by the random selection of 25 practicing dentists in each district. Ethical approval was obtained from the ethical committee at the Department of Public Health and Dentistry, Sree Balaji Dental College and Hospital. The sample size comprised 120 practicing Dental Professionals. Inclusion criteria included dental professionals actively engaged in clinical practice who personally consented to participate. Exclusion criteria encompassed those who had ceased practicing dentistry or were solely engaged in teaching, research or development. The self-validated questionnaire comprised three parts: Personal Data, Association of Tremors with Perfection in Dentistry, and Dentist's Objectives to Rectify Tremors. The

questionnaire aimed to determine factors contributing to tremors, whether genetic or related to alcohol intake and their association with diminished clinical precision, potentially resulting in iatrogenic injury, patient discomfort and inadvertent pulp exposure. Content validation of the questionnaire was conducted to ensure its accuracy and relevance. For data analysis, IBM SPSS Statistics for Windows, Version 26.0, was utilized. The significance level was set at 5% ($\alpha = 0.05$). Descriptive statistics were employed to summarize the data, Chi-Square test Fisher's exact test was applied.

3. Results and discussion

The significance of this research underscores the demanding nature of the dental profession, with dental surgeons being particularly susceptible to essential tremors and hand shakiness. Essential tremors can significantly impact daily activities, including writing and performing intricate tasks. According to Table 1 in the study, 64.2% of clinicians reported experiencing hand shakiness or tremors during their clinical work. Given that essential tremors are autosomal dominant and genetically inheritable, they can be passed down through generations [5].



Figure 1: Percentage-wise distribution of years of Experience

Table 1: Association between Years of working experience with essential tremors

Questionnaire	Variables (%)		Years of Experience (%)						P Value
			< 5 years		5-10 years		> 10 years		
	Yes	No	No	Yes	No	Yes	No	Yes	
Loss of work imperfection	63.3%	36.7%	28.3%	71.7%	47.1%	52.9%	37.5%	62.5%	0.2
Family history	64.2%	35.8%	26.1%	73.9%	44.1%	55.9%	40.0%	60.0%	0.2
Alcohol consumption	64.2%	35.8%	26.1%	73.9%	44.1%	55.9%	40.0%	60.0%	0.2
Difficulties in treating patient	64.2%	35.8%	26.1%	73.9%	44.1%	55.9%	40.0%	60.0%	0.2
Accidental pulp opening	64.2%	35.8%	26.1%	73.9%	44.1%	55.9%	40.0%	60.0%	0.2
Iatrogenic injury to patients	64.2%	35.8%	26.1%	73.9%	44.1%	55.9%	40.0%	60.0%	0.2
Undergone any lifestyle changes to improve the condition	65%	35%	23.9%	76.1%	44.1%	55.9%	40.0%	60.0%	0.1
Doctor consultation	65%	35%	23.9%	76.1%	44.1%	55.9%	40.0%	60.0%	0.1
Medication	47.5%	52.5	41.3%	58.7%	70.6%	29.4%	50.0%	50.0%	0.03

Table 1 depicts there was a statistically significant association was found with working experience and medication

This highlights the importance of understanding and addressing the implications of essential tremors in dental practice. The findings from Table 1 indicate that 64.2% of the sample have a family history of essential tremors, underscoring the genetic component of this condition [7]. However, other causative factors include the duration of practicing clinical dentistry and increasing biological age. Years of practicing dentistry may reflect the duration of exposure to mercury during amalgam fillings, as mercury has been linked to increased tremor frequency. 43% of dentists with essential tremors have between 10-20 years of dental clinical practice and 23% have between 5-10 years of practice. These findings suggest a potential association between years of clinical practice and the development of essential tremors among dentists.

The data reveals that 64.2% of dentists with essential tremors, have caused iatrogenic injury to patients and had discomfort in treating patients. This suggests a significant association between essential tremors in dentists and adverse outcomes for patients. Literature also supports this notion, as evidenced by cases such as that of a neurosurgeon who experienced difficulties during surgery due to essential tremors. Initially, lifestyle changes and medications were attempted to alleviate the tremors. However, given the significant impact on surgical outcomes, the neurosurgeon eventually opted for Deep Brain Stimulation Surgery [12, 13].

Evidence suggests that yoga events led by physical therapists for patients with essential tremors can result in relaxation and increased steadiness. Similarly, a study indicates that 70% of dentists with essential tremors undertake lifestyle changes like practicing yoga to calm their mind and enhance their work precision [13]. Given the rarity of documentation regarding the incidence of essential tremors among dentists, this study sheds light on the seriousness of the issue. It emphasizes the importance for dentists to address essential tremors through lifestyle modifications, medication, or potentially Deep Brain Stimulation Surgery to prevent serious patient injuries. By proactively managing their condition, dentists can ensure the safety and well-being of their patients.

The literature as presented by Doctors Guy Giacomuzzi, Melanie Lising and Casey H Halpern describes a case where a dentist with essential tremors underwent lifestyle changes and medications such as Beta Blockers and Primidone to control the tremors. However, as the dentist aged, sustaining the tremor control became challenging leading to the decision to undergo Deep Brain Stimulation Surgery. The surgery targeted the thalamus region and allowed the dentist to selectively activate the stimulation during clinical practice for improved precision [12]. Regarding the data dentists with essential tremors who consume alcohol suggesting a trend towards tremors. On the other hand, dentists who experience increased hand shakiness with age have a greater significance. These findings indicate a potential association between alcohol consumption and essential tremors, as well as a significant

correlation between age-related hand shakiness and the presence of essential tremors among dentists.

4. Conclusions

The prevalence rate of essential tremors in dentists highlights the potential risk of iatrogenic injury and patient discomfort associated with tremors. Indeed, both increasing age and years of clinical practice may contribute to essential tremors. Therefore, the conclusion drawn from this study emphasizes the importance of dentists recognizing the seriousness of essential tremors in clinical practice and taking proactive measures to address them. Lifestyle changes or medication may be necessary to rectify tremors and prevent their negative impact on patient care.

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