

# Knowledge and awareness about fluoride varnishes among dental students

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## ABSTRACT

**BACKGROUND:** Fluoride varnish is a highly concentrated form of topical fluoride with a synthetic base, which is applied to the tooth surface for caries prevention, hypersensitivity treatment, or enamel remineralisation. It was developed to prolong the contact time between the fluoride and tooth surface because the varnish adheres to the tooth surface for longer periods in a thin layer. Such fluoride varnish has been used widely in dental clinics as a simple and effective way to protect the tooth surface against acid produced by cariogenic bacteria and Dental caries since dental caries can compromise quality of life and is associated with demineralisation of tooth structure by organic acids produced by microorganisms. Awareness and knowledge about fluoride varnish, its significance, application and its recent advances is important for better management and care. The aim of this study is to analyse the awareness about fluoride varnish among dental students.

**MATERIAL AND METHOD:** A questionnaire based study consisting of 15 questions and was distributed among the local population. The sample size was 100. The research was done among the Dental students in Chennai.

**RESULTS:** The results of the study shows that most dental students encounter pedo patients with caries everyday which shows the importance of awareness of preventive dentistry. Almost 95% of the dental students were aware that fluoride varnish is used for prevention of dental caries but almost 60% of the population was unaware about the mechanism of action of fluoride. Among various regimens of fluoride application the most known was water fluoridation followed by fluoride incorporated tooth pastes. 90% of the population was unaware of light curable fluoride varnishes (LCFV). And among the people who were aware about LCFV, most were not aware about the exact use of LCFV and the application.

**CONCLUSION :** To conclude, dental students were aware of the importance of fluoride varnish but there was lack of knowledge about mechanism of action of fluoride and some recent advances in fluoride varnish like light curable fluoride varnishes. Knowledge about the recent advances, the application of it and the mechanism of action of them is vital to effectively treat and prevent dental caries and improve the quality of treatment.

**KEYWORDS:** LCFV, hypersensitivity, synthetic base

## INTRODUCTION

Dental caries is associated to demineralisation of tooth structure by organic acids made by microorganisms, which might progress from the outer tooth structure towards the inner important tissue inflicting pain and swelling[1]. The Dental caries are the single commonest chronic childhood malady, with over 1/2 kids experiencing one or a lot of decayed or filled surfaces by the age of 5 and this prevalence will increase to over seventy eight amongst seventeen year olds[2]. Untreated cavity may result in life threatening conditions requiring hospitalisation. The toddlers with untreated cavity exhibit poor quality of life involving pain, uptake and drinking difficulties, sleeping problem and a way of guilt amongst the family[3], whereas pre-school aged kids additionally expertise disturbed sleep, scrawny growth, higher risk of hospitalisations and emergency dental visits and accumulated absence from college and reduced learning ability[4]. so comprehensive proof based mostly approaches should be developed and enforced for management of caries.

Currently, management of decay involves preventive and non-preventive treatment strategies. whereas non-preventive caries management involves stopping or slowing the disease progress by mechanical caries removal and restoration of decayed tooth structure, preventive dental caries protocols, also, to stop the onset of dental caries and defend the teeth from the conditions that favour the harmful impacts of oral biofilm. Various forms of fluoride therapy are used to prevent and arrest dental caries.

### Methods of fluoride use

The first mechanism of action of fluoride is its incorporation into the mineral structure, reducing the dissolution of this structure because of the lower solubility of the mineral apatite compared to hydroxyapatite. This mechanism was later shown to be incorrect, since the general substitution of apatite within the mineral of teeth failed to exceed 100 percent, and will not be liable for the tremendous reduction within the dental caries rate determined within the presence of fluoride. Though quite thirty years have passed since the impact of fluoride was recognised as a result of its presence during a soluble, ionic kind within the oral cavity[5], the mistaken initial interpretation of however fluoride works still makes the adequate use of halide strategies a challenge. The most effective example is the classification of the strategies of fluoride use as "systemic" or "topic". Not solely is that this classification wrong, considering that the utilisation of fluoridated water aims to deliver fluoride to the rima ("topical effect"), and to not strengthen teeth that are shaped throughout its use ("systemic effect"), however it additionally makes it tough to know however, once and within which kind halide ought to be administered. Hence, it's imperative that we have a tendency to leave the classification of "systemic" and "topical" types of fluoride use behind, and contemplate that each one strategies of usage of fluoride eventually aim at delivering fluoride, in order that it will exert its impact on dental caries control[6] [7]. Thus, the various ways in which using fluoride ought to be classified per the strategy accustomed deliver halide to the oral cavity: community-based, individual, skilled or the mixture of all.

### Mechanism of action of fluoride

Shellis and Duckworth found that fluoride acts locally to prevent dental caries[8]. Fluoride inhibits plaque metabolism, alters plaque composition, prevents plaque formation, and reduces the plaque bacteria's ability to supply massive amounts of acid from carbohydrates[8]. Fluoride inhibits enamel demineralization. The Ca fluoride that's deposited on a tooth surface, without delay it dissolves and might act as a fluoride reservoir. Fluoride can also lower the pH scale worth of hydroxyapatite crystal dissolution (the pH scale worth at the time that demineralization occurs) from 5 to 4.5 within the mouth. Additionally, fluoride is often incorporated incrementally into fluoro mineral crystals on the tooth surface, creating a lot of immunity to acid dissolution. Additionally to inhibiting demineralization, uoride enhances enamel remineralization, increasing the speed of the remineralization method and therefore the mineral content of early unhealthy lesions. The incorporation of fluoride makes the deposited minerals less acid-soluble[9].

### Methods of fluoride incorporation

Some of the common methods of fluoridation are water fluoridation , fluoridated salt, fluoridated milk, fluoride toothpaste, fluoride supplements (in the form of a drop or tablet), fluoride chewing gum, fluoride solution, fluoride mouth-rinse, fluoride gel, fluoride foam, fluoride mousse, and fluoride varnish.

### Fluoride varnish

Fluoride varnish is one of the foremost focused fluoride product offered commercially. Most fluoride varnishes contain 5% NaF (22,600 ppm fluoride) during a natural natural resin base, that permits the varnish to stick to tooth surfaces within the presence of saliva[10]. Fluoride varnish may be applied quickly and simply. It sets readily on tooth surfaces so the gagging area decreases . As a tooth decay preventive agent, there's proof that it's as eec-tive as APF foam[11]. However, compared to APF foam (which needs youngsters to bite into trays for four minutes), fluoride varnish seems to be the simpler methodology of tooth decay for each dental practitioner and therefore the kid. The FDI World Dental Federation additionally recommends fluoride varnish for people in danger for tooth decay. The simplicity and satisfactoriness of fluoride varnish.

### Light-curable fluoride varnish

Topical fluoride applications in the form of fluoride varnish have been used extensively and proven effective in the prevention of demineralisation[12,13], however, repeated application is required for conventional fluoride varnish to retain its anti-caries effect[14]. Hence, light-curable fluoride varnish (LCFV), which has been shown to be advantageous in terms of longevity and sustainability[15,16], has been increasingly used. Several studies have shown that LCFV effectively prevents enamel demineralisation on a longer term than conventional fluoride varnish[15,16]. Moreover, the occurrence of white spot lesions during comprehensive orthodontic treatment can be prevented by the use of LCFV[17]. Still, fluoride varnish has a limitation in that it does not fully protect the underlying dental tissue, while fluoride alone cannot effectively prevent enamel demineralization[18,19].

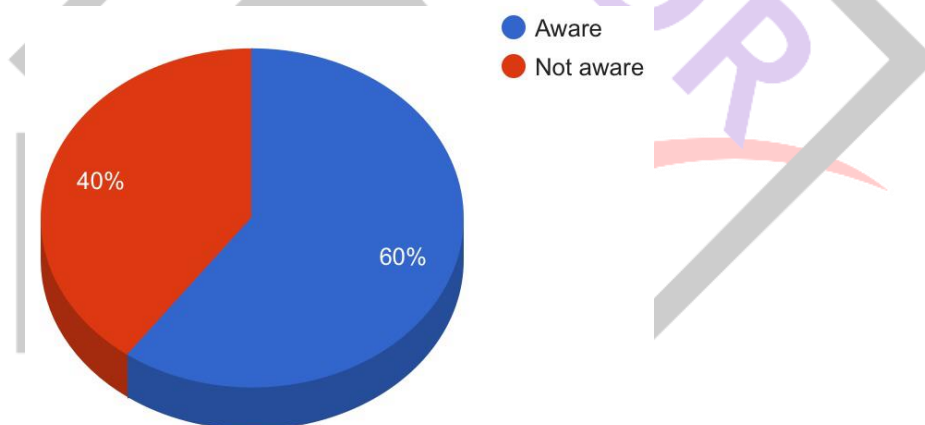
Topical fluoride applications within the type of fluoride varnish are used extensively and evidenced effective within the bar of demineralization[12,13], however, repeated application is needed for standard fluoride varnish to retain its anti-caries effect[14]. Hence, light-curable halide varnish (LCFV), that has been shown to be advantageous in terms of longevity and sustainability[15,16], has been more and more used. Many studies have shown that LCFV effectively prevents enamel demineralization on an extended term than standard fluoride varnish[15,16]. Moreover, the prevalence of white spot lesions throughout comprehensive treatment may be prevented by the employment of LCFV[17]. Still, halide varnish features a limitation therein it doesn't absolutely defend the underlying dental tissue, whereas fluoride alone cannot be effectively used for enamel demineralization[18,19].

### **MATERIALS AND METHODS**

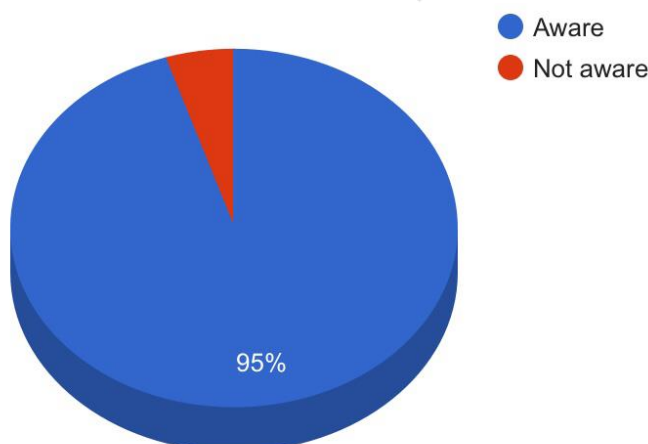
A questionnaire based study consisting of 15 questions and was distributed among the local population. The sample size was 100. The research was done among the dental students in chennai. In this survey there were no right or wrong answers and no time limit was given to them. The people were asked to answer only the questions which they know or only the questions which they can understand and the remaining questions were asked to skip. After the completion of questions by the people the responses were interpreted in accordance with the norms.

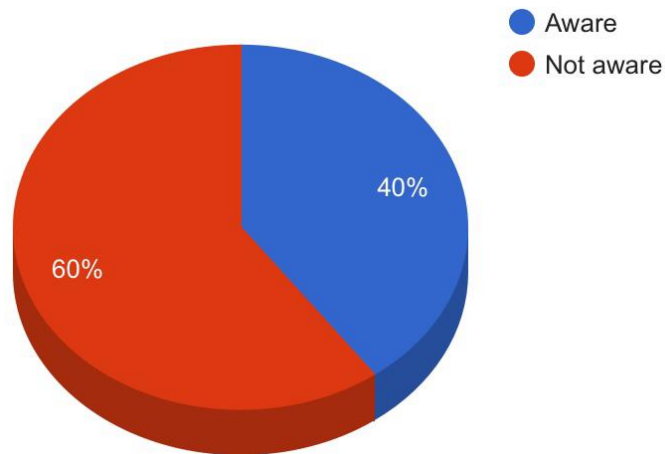
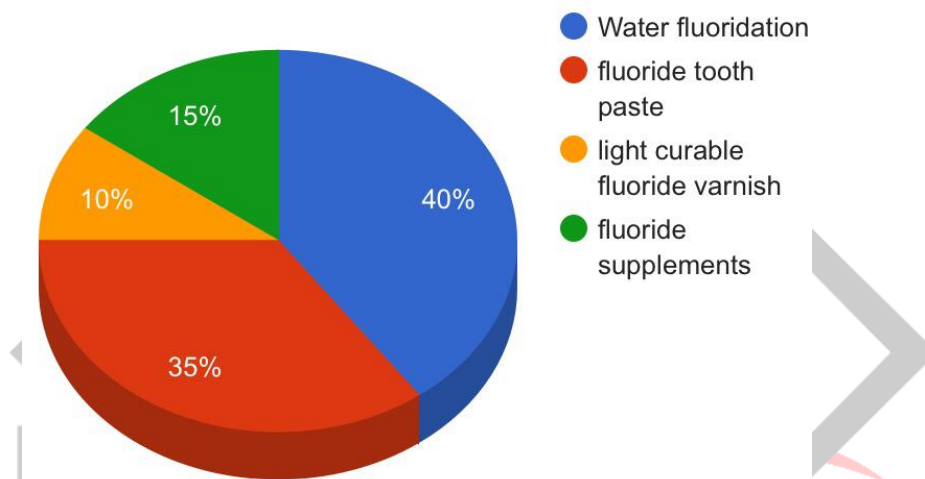
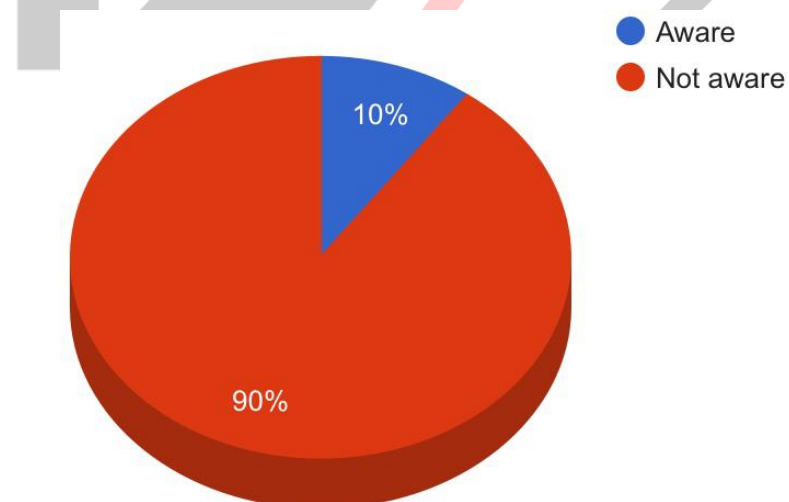
### **RESULTS**

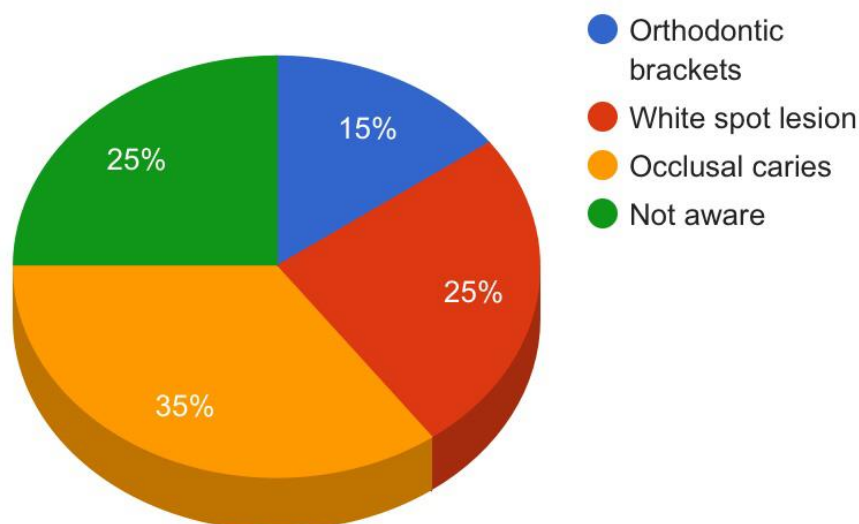
#### Frequently of encountering pedo patients with caries



#### Awareness about fluoride varnishes on prevention of dental caries



Awareness of the mechanism of action of fluorideOther regimens for fluoride applicationAwareness about light curable fluoride varnish

Awareness about Usage of Light curable fluoride varnish**DISCUSSION**

Dental caries is one of the most common childhood diseases[2]. It is therefore very important to identify approaches for the management of dental caries that are minimally invasive, such as water fluoridation, fluoridated toothpastes, topical fluoride varnishes[20]. Fluoride interferes microbial processes of the oral biofilm and inhibits demineralization[21]. Thus fluoride is not only a preventive means to reduce caries prevalence, but can also partake in caries arrest.

The results of the study shows that most dental students encounter pedo patients with caries everyday which shows the importance of awareness of preventive dentistry. Almost 95% of the dental students were aware that fluoride varnish is used for prevention of dental caries but almost 60% of the population was unaware about the mechanism of action of fluoride. Among various regimens of fluoride application the most known was water fluoridation followed by fluoride incorporated tooth pastes. 90% of the population was unaware of light curable fluoride varnishes(LCFV). And among the people who were aware about LCFV, most were not aware about the exact use of LCFV and the application.

**CONCLUSION**

To conclude, dental students were aware of the importance of fluoride varnish but there was lack of knowledge about mechanism of action of fluoride and some recent advances in fluoride varnish like light curable fluoride varnishes. Knowledge about the recent advances, the application of it and the mechanism of action of them is vital to effectively treat and prevent dental caries and improve the quality of treatment.

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