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ABSTRACT

Introduction: Fluoridated toothpaste contains fluoride (F), which can control caries by reducing demineralization of enamel, promoting the re-mineralization of enamel and inhibiting the metabolism of bacteria. Although fluoridated toothpaste has certain anti-caries effects, excessive intake may cause some adverse effects such as skeletal fluorosis and dental fluorosis. In addition, studies have found that the accidental swallowing of fluoridated toothpaste in children may be 2–3 times the safe limit, suggesting that use of fluoridated toothpaste may be a risk factor for dental fluorosis.

Aim: The aim of this study is to assess the knowledge and awareness on the usage of fluoridated toothpaste among the general population, especially parents of minor children.

Materials and method: A questionnaire based survey was conducted through an online survey from February to April 2021 the parents of children below 18. Data was analysed with the SPSS software version 22. Descriptive statistics as percent were calculated to summarise qualitative data. Chi square test was used to analyze.

Result: Most of the respondents (41%) were the parents of children at the age of 0-5 years. About 77% of the respondents are aware of the mineral fluoride. An early 78% of the respondents were aware that our teeth need fluoride to prevent dental caries and the remaining 22% were not aware.

Conclusion: The present survey within the limitations concludes that there is adequate knowledge and awareness regarding the benefits of fluoridated toothpaste usage among the overall survey population.

Keywords: Fluoride, caries, toothpaste, children.

INTRODUCTION

Fluoridated toothpaste contains fluoride (F), which can control caries by reducing demineralization of enamel, promoting the re-mineralization of enamel and inhibiting the metabolism of bacteria(1). Although fluoridated toothpaste has certain anti-caries effects, excessive intake may cause some adverse effects such as skeletal fluorosis and dental fluorosis(2). In addition, studies have found that the accidental swallowing of fluoridated toothpaste in children may be 2–3 times the safe limit, suggesting that use of fluoridated toothpaste may be a risk factor for dental fluorosis(3). Tooth decay (dental caries) is painful, expensive to treat and can sometimes lead to serious damage to teeth. Fluoride is a mineral that prevents tooth decay(4). There have been some reports from western countries on an increase in the prevalence of dental fluorosis in both fluoridated and non-fluoridated communities(5); its prevalence and severity is dependent on the phase of mineralization of tooth enamel when excessive exposure to fluoride occurs, the amount of fluoride and the duration of fluoride exposure, and body weight(6). The susceptibility of the permanent incisors and the first permanent molars to fluorosis would appear to be greatest during the first 4 yr of life(7), as these teeth begin to form soon after birth and erupt at about 7 yr of age. However, chronic excessive ingestion of fluoride from 3 to 6 yr of age can also put the later erupting permanent canines, premolars, and second molars at risk(8).

Dental fluorosis is a developmental defect of enamel caused by ingestion of F prior to eruption of the tooth into the oral cavity. The effect is systemic and depends on the F concentration around the developing tooth during enamel formation. The risk of fluorosis and its severity is dependent on a wide range of factors such as the timing of the F ingestion, amount ingested, its bioavailability, the developmental stage of the tooth, duration of the exposure and the body weight of the child(9). Poor knowledge of oral health results in inappropriate oral hygiene behaviors(10). Moreover, according to the fourth Chinese Oral Health Epidemiological Survey, the

knowledge of fluoridated toothpaste among Chinese was still at a relatively low level(9). Thus, it is particularly important to carry out oral health education regarding knowledge and use of fluoridated toothpaste. As directors of medical activities, doctors' awareness regarding health care issues affects their decisions and advice given in clinical practice, and also influences the awareness of patients and the public(11).

However, few studies have specifically focused on the awareness of doctors regarding fluoridated toothpaste, and no studies have investigated parent's awareness of using fluoridated toothpaste. Our team has extensive knowledge and research experience that has translate into high quality publications(12–21),(22–25),(26–30) (31) Basically, the present study was to assess the knowledge and awareness on the usage of fluoridated toothpaste among the general population, especially parents of minor children.

MATERIALS AND METHODS

This study setting includes an online survey involving the parents of children below the age of 18 from different locations. Ethical approval and informed consent from the participants is required. The number of people involved are the study participant and analyser. The sampling method is stratified random sampling. The measure taken to minimize the sampling bias is stratification and matching independent variables in a selected sample. The internal validity is the usage of a pretested questionnaire. The external validity is homogenization and replication of the experiment.

Data was collected. A questionnaire contains a set of 14 questions with a validity checking. Data collection software was used. Data manipulation / clean up in excel spreadsheet. The list of output variables that are to be assessed are the awareness on the use of fluoridated toothpaste for children among the general population. The method of representation of each output variable is a pie chart.

The statistical test used here is the chi square test. The statistical software used is a SPSS. The list of independent variables are the knowledge and age. The list of dependent variables is knowledge on fluoridated toothpaste. The type of analysis used is the correlation and association in chi square. The steps followed in software analysis.

RESULTS AND DISCUSSION

The present study mainly aims to assess the knowledge on the usage of fluoridated toothpaste among our general population. Here 53% of the respondents were female parents and 47% were male parents. 27% of the respondents were in the age group of 20-25 years, another 27% of the respondents were in the age group of 25-30 years old and the remaining 22% and 23% were in the age group of 30-35 and 35-40 years old. Most of the respondents (41%) were the parents of children at the age of 0-5 years. About 77% of the respondents are aware of the mineral fluoride. An early 78% of the respondents were aware that our teeth need fluoride to prevent dental caries and the remaining 22% were not aware. 68% of the responded parents are aware of fluoridated toothpaste. About 79% of the respondents use fluoridated toothpastes and the remaining 21% don't use fluoridated toothpaste. Nearly 50% of the population responded that their children brush their teeth only once a day, 43% responded that their children brushed their teeth twice a day. 46% of the respondents are aware that it is necessary to brush their teeth twice a day and 47% are not aware that it is not necessary to brush their teeth twice a day. About 76% of the respondents are aware that fluoridated toothpaste prevents tooth erosion and the same 76% are aware that fluoride helps in remineralisation. Only 29% of the respondents are aware that using high concentrations of fluoride will not cause fluorosis. 76% of the population are aware that fluoridated toothpaste is more efficient than the systemic intake of fluoride. About 72% of the respondents are aware of the professionally administered fluoride administration and among them 78% were experienced fluoride varnish and 21% experienced pits and fissures sealants. Nearly 71% of the parents have supervised their kid while brushing and 15% of them supervised their kid sometimes while brushing. About 75% of the respondents are aware that only a "pea" size of toothpaste should be used for brushing children and the remaining 25% were not aware. 77% of the respondents were aware of the ppm values of the tooth pastes and the remaining 23% were not aware of the ppm values. Another study assessed the knowledge of fluoridated toothpaste and the results of this study showed that the use of fluoridated toothpaste among dentists was significantly higher than that among NDDs, and this may be associated with the higher proportion of dentists who understood the efficacy of fluoridated toothpaste in the control of caries, nearly half of the dentists and most NDDs were not using or were unsure whether they were using fluoridated toothpaste, although 90% of dentists and 54.3% of non-dentists knew the anti-caries effect of fluoridated toothpaste(32). Animal experiments and clinical studies showed that excessive intake of fluoride can cause functional impairment of organs (e.g., liver, kidney, stomach, and brain) and can also be cytotoxic(33). Wright et al. reported that improper use of fluoridated toothpaste can lead to fluorosis if the total fluoride intake exceeds the safe limit. Therefore, it was proposed that there were certain risks in the use of fluoridated toothpaste in children(34). In addition, studies showed that the prevalence of dental fluorosis among fluoridated toothpaste users in high-fluoride areas was about twice that of those who did not use fluoridated toothpaste(35). Marinho et al. also found that children swallow 30~50% of the total amount of

toothpaste when brushing their teeth, and the amount of swallowing is positively correlated with the amount of toothpaste used(36).

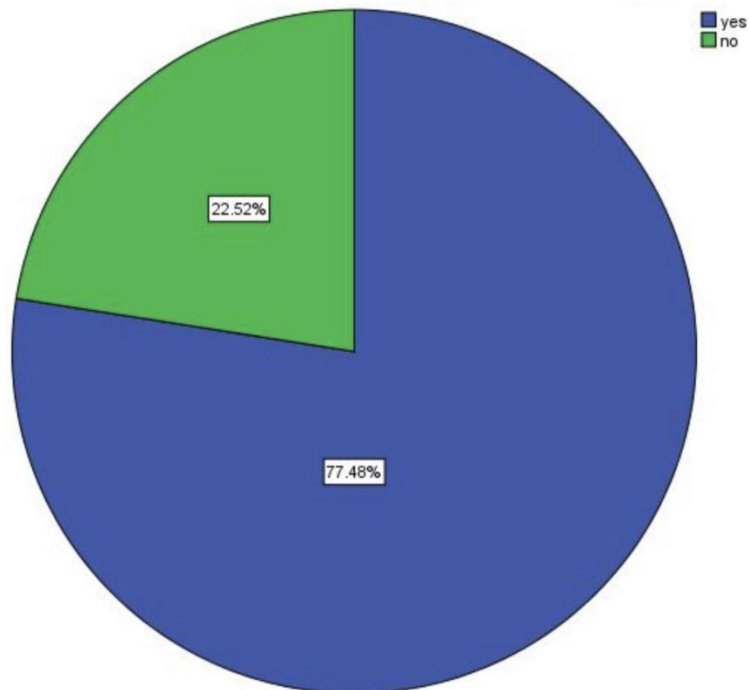


Figure 1: Pie chart representing the frequency distribution of awareness on mineral fluoride where blue colour denotes yes and green colour denotes no. Majority (77%) of the participants are aware.

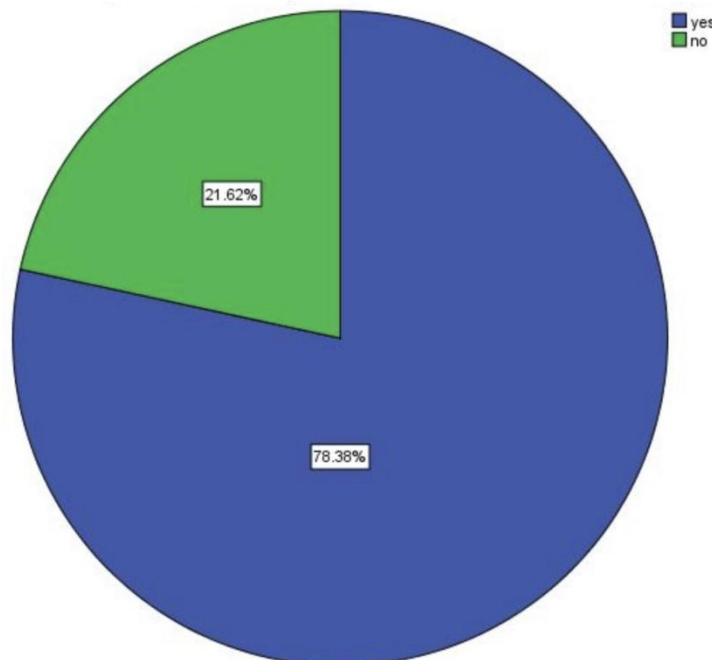


Figure 2: Pie chart representing the frequency distribution of awareness on whether our teeth need fluoride to prevent dental caries where blue colour denotes yes and green colour denotes no. Majority (78%) of the participants are aware.

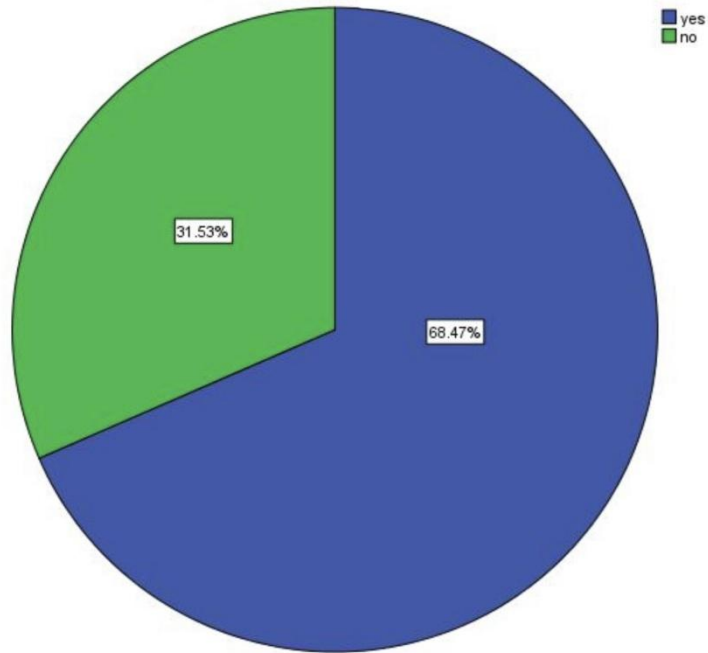


Figure 3: Pie chart representing the frequency distribution of awareness on fluoridated toothpaste where blue colour denotes yes and green colour denotes no. Majority (68%) of the participants are aware

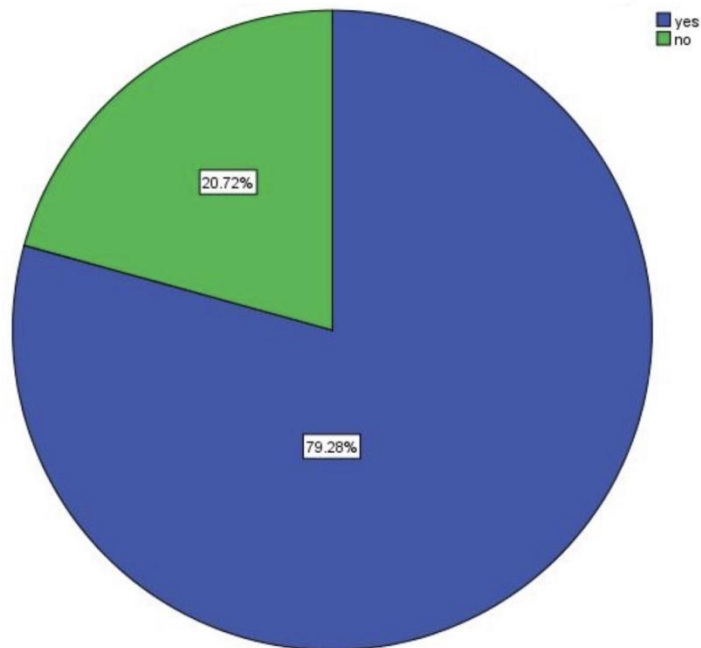


Figure 4: Pie chart representing the frequency distribution on whether they use fluoridated toothpaste where blue colour denotes yes and green colour denotes no. Majority (79%) of the participants use fluoridated toothpaste.

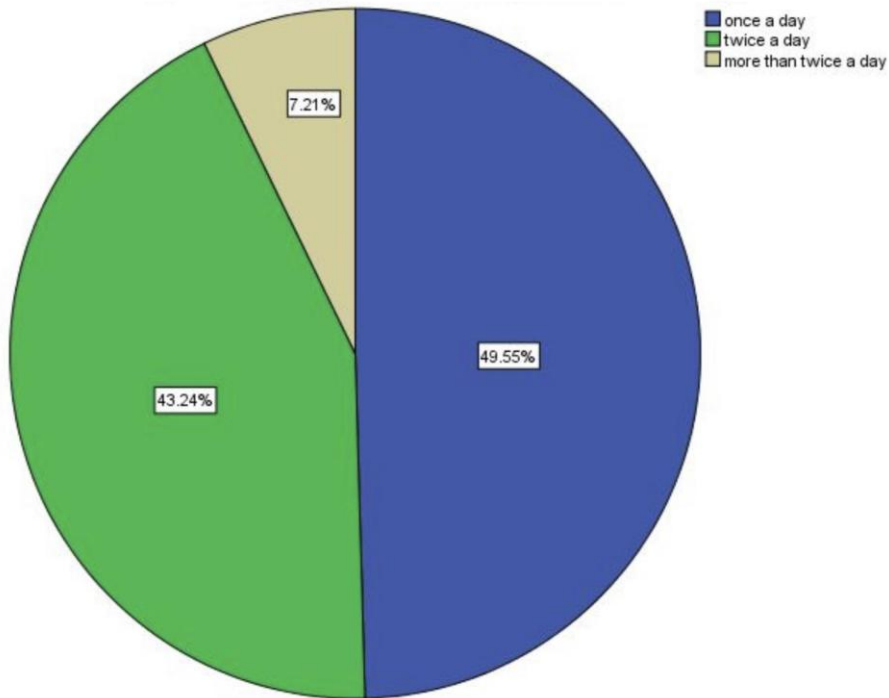


Figure 5: Pie chart representing the frequency distribution on how many times does their child brushes his/her teeth every day where blue colour denotes once a day, Green colour denotes twice a day and yellow colour denotes more than twice a day. Majority 49% of their kids brush their teeth only once a day and 43% of their kids brush twice a day.

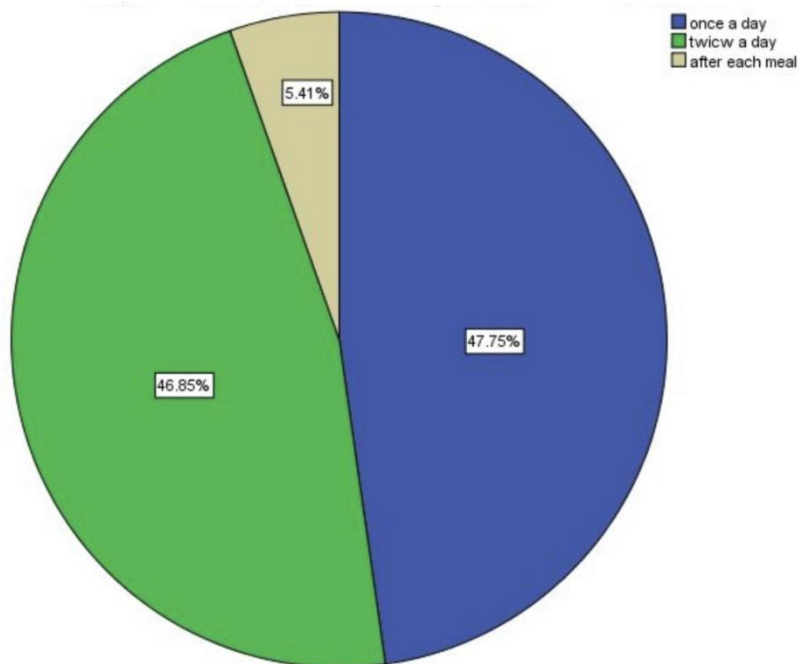


Figure 6: Pie chart representing the frequency distribution of whether it is necessary to brush with fluoridated toothpaste where blue colour denotes once a day, green colour denotes twice a day and yellow colour denotes after each meal. Majority 47% are aware that it is necessary to brush with fluoridated toothpaste.

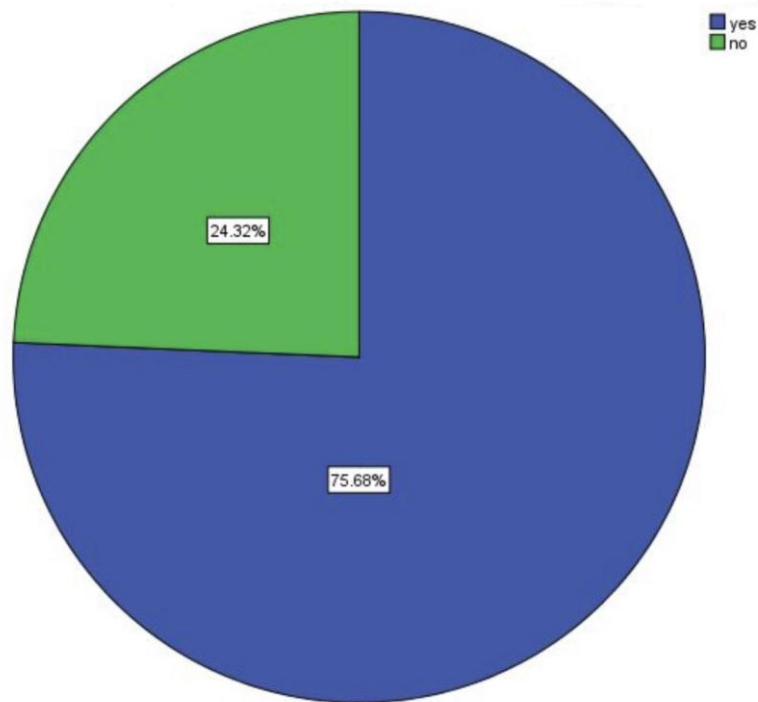


Figure 7: Pie chart representing their frequency distribution of awareness on whether fluoridated toothpaste prevents tooth erosion where blue colour denotes yes and Green colour denotes no. Majority 76% of the participants are aware.

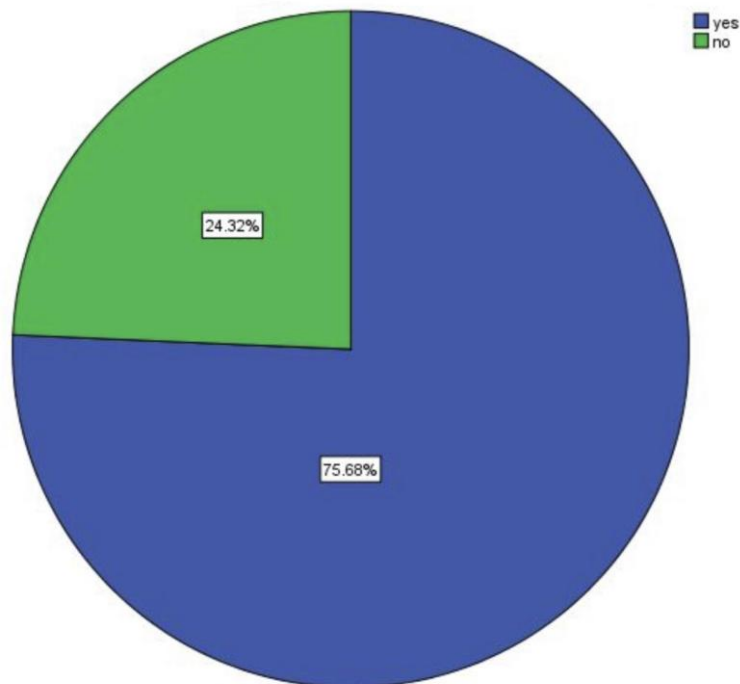


Figure 8: Pie chart representing their frequency distribution of awareness on whether fluoride helps in re-mineralisation where blue colour denotes yes and green colour denotes no. Majority 75% of the participants are aware.

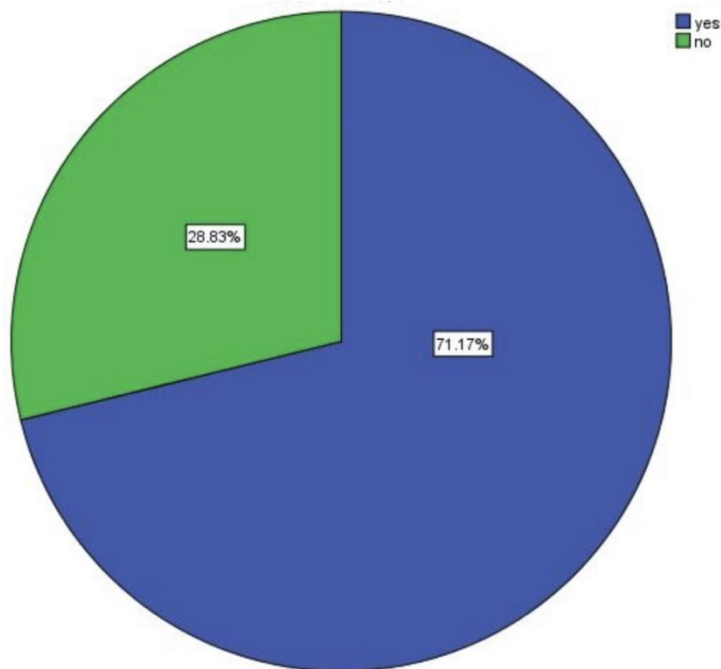


Figure 9: Pie chart representing the frequency distribution of awareness on whether using high concentration of fluoride causes dental fluorosis when a blue colour denotes yes and green colour denotes no. Majority 71% of the participants are not aware.

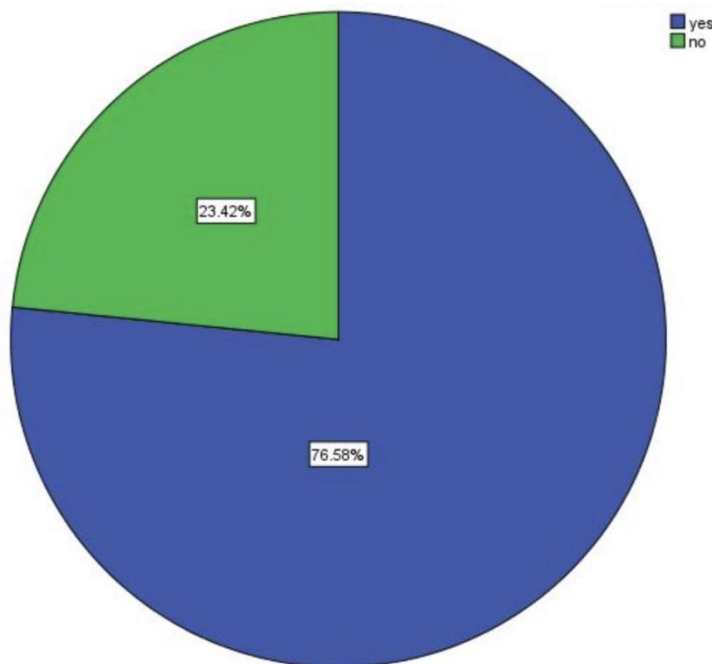


Figure 10: PieChat representing the frequency distribution of awareness on using fluoridated toothpaste is more efficient than in the system in intake of fluoride wear blue colour denotes yes and a green colour denotes no. Majority 76% of the participants are aware.

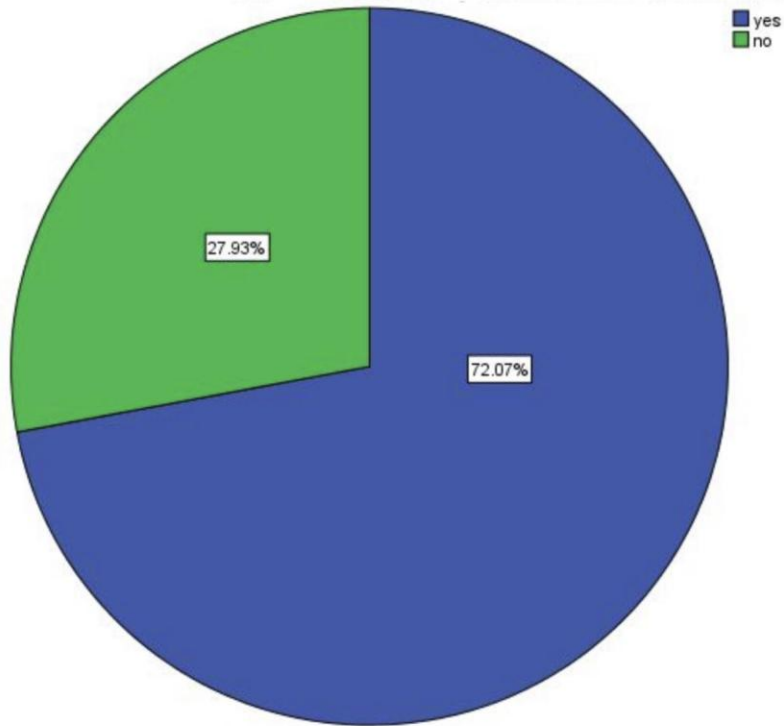


Figure 11: Pie chart representing their frequency distribution of awareness on professionally administered fluoride administration where blue colour denotes yes and green colour denotes no. Majority 72% of the participants are aware.

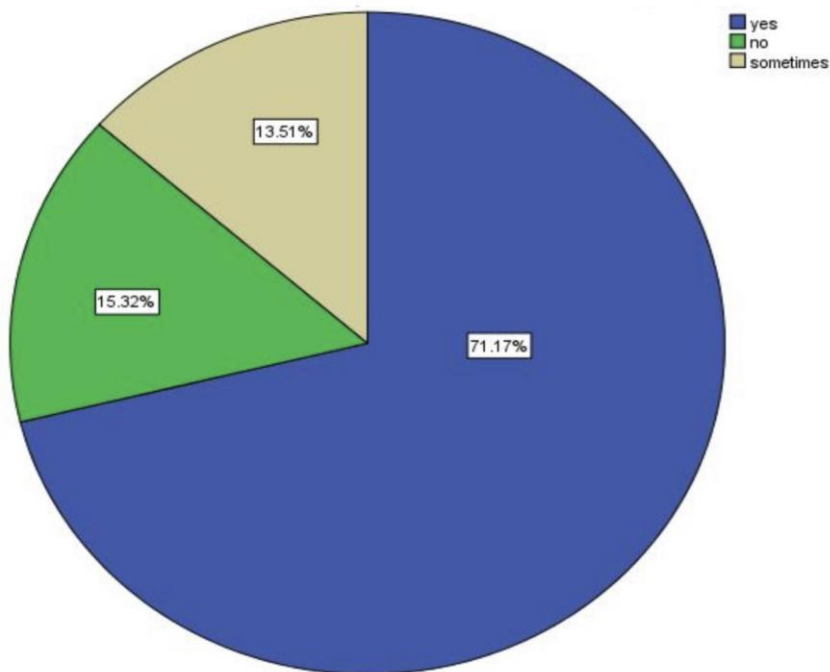


Figure 12: Pie Chart representing the frequency distribution of whether they supervise their kid while brushing, where blue colour denotes yes, green colour denotes no and yellow colour denotes sometimes. Majority 71% of the participants supervise their kid while brushing.

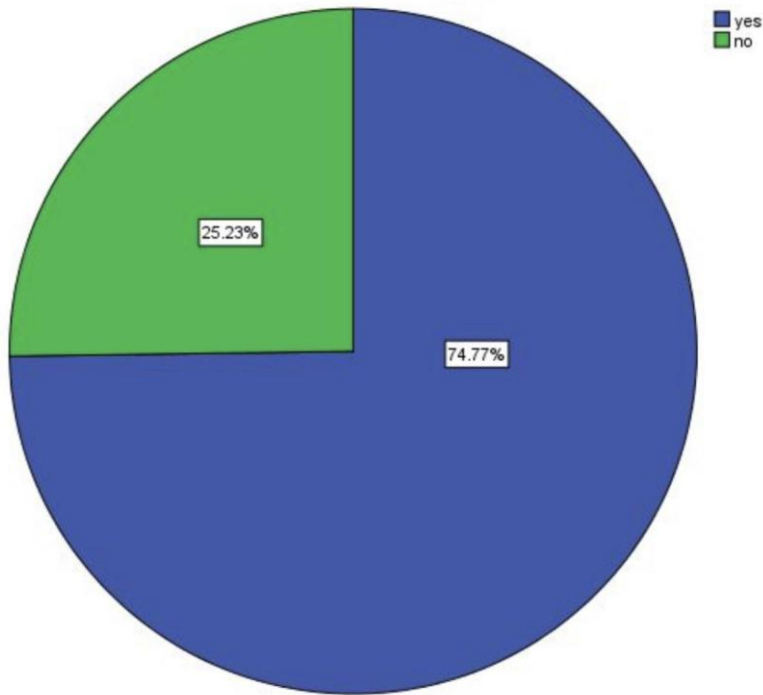


Figure 13: Pie chart representing their frequency distribution of awareness that only 'Pea' size of toothpaste should be used for brushing children where blue colour denotes yes and green colour denotes no. Majority 74% of the participants are aware.

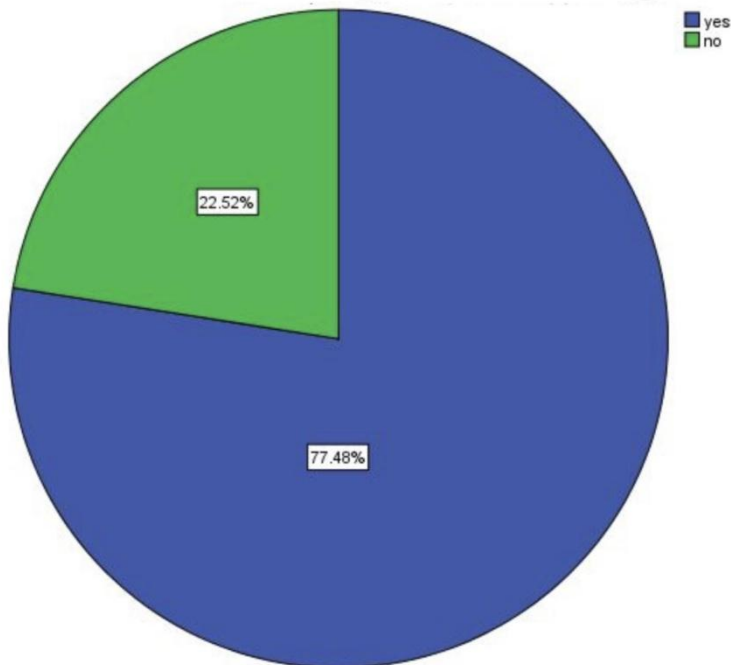


Figure 14: Pie chart representing the frequency distribution of awareness on ppm values of toothpaste where blue colour denotes yes and green colour denotes no. Majority 77% of the participants are aware.

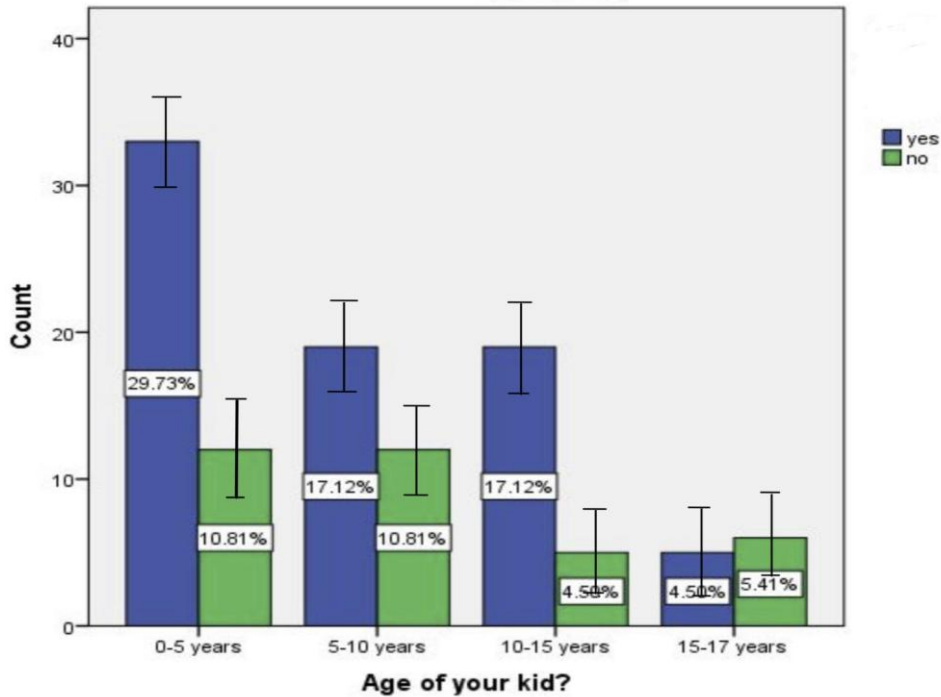


Figure 15: The bar chart represents the awareness of mineral fluoride. X axis represents the parents of children’s age group. Y axis represents the number of respondents obtained for yes(blue), no(green). Parents of children’s age group is significantly associated with their awareness of mineral fluoride. Pearson chi square test value which is statistically significant.

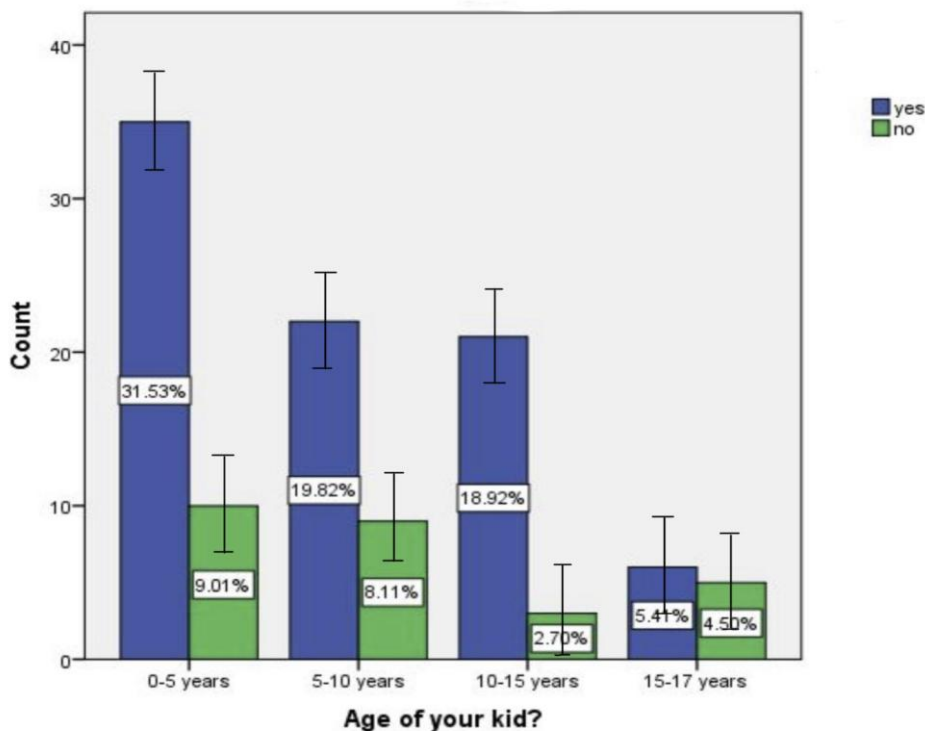


Figure 16: The bar chart represents their awareness on whether fluoride helps in remineralisation. X axis represents the parents of children’s age group. Y axis represents the number of respondents obtained for yes(blue), no(green). Parents of children’s age group is significantly associated with their awareness on whether fluoride helps in remineralisation. Pearson chi square test value which is statistically significant.

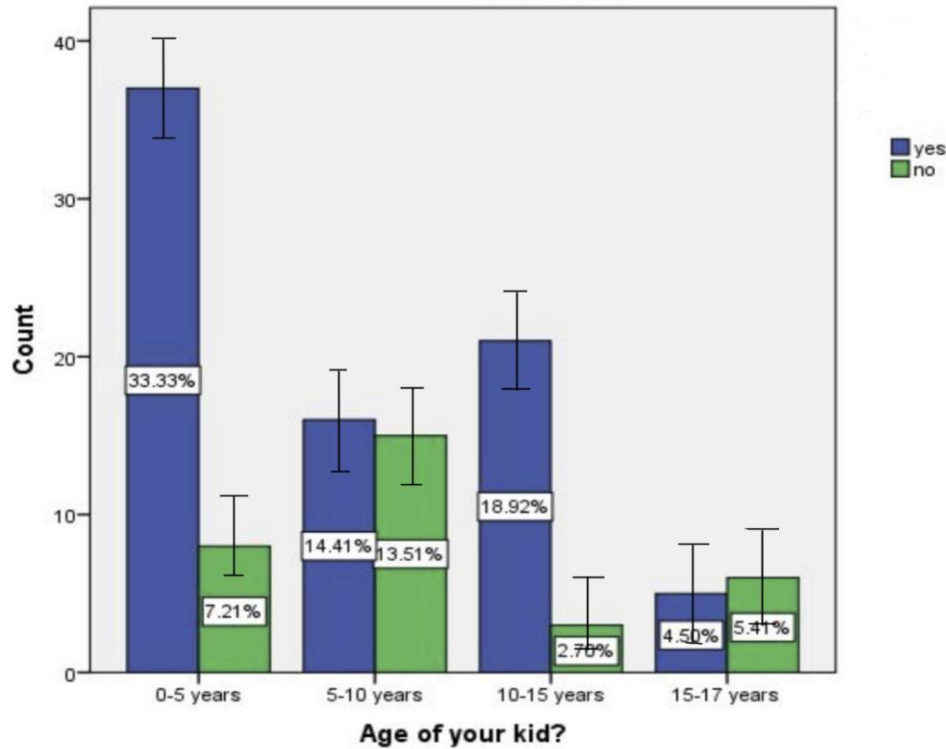


Figure 17: The bar chart represents the Awareness on whether using high concentration of fluoride causes dental fluorosis. X axis represents the parents of children's age group. Y axis represents the number of respondents obtained for yes(blue), no(green). Parents of children's age group is significantly associated with their awareness on using high concentration of fluoride causes dental fluorosis. Pearson chi square test value which is statistically significant.

CONCLUSION

The present survey within the limitations concludes that there is adequate knowledge and awareness regarding the benefits of fluoridated toothpaste usage among the overall survey population. It is also very much evident from the survey study that usage of fluoridated toothpaste promotes child's oral health.

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Conflict Of Interest

NIL

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