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Knowledge, attitude and practice of management of fluorosis among dental students

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***Abstract*---**Introduction: Dental fluorosis is a condition which occurs due to exposure to fluoride than required.The condition begins at the first eight years of life which leads to an eruption of discolored teeth with stains from yellow to dark brown, surface irregularities and noticeable pit. It can be treated by teeth whitening, composite bonding and Porcelain veneers. Aim: To determine knowledge, attitude and practice on the management of fluorosis among dental students. Materials and Methods: Self-administered structured questionnaires were designed based on the knowledge, attitude and practice on the management of Fluorosis among the dental students. The questionnaire was distributed through online google forms link, the study population included 100 General dental practitioners and specialists in Chennai.The data was collected and statistically analysed in SPSS of version 26.0. The study was approved by the Institutional Review Board. Results: In the current survey based on the results obtained 72.48% of second years had participated in the survey among whom 48.62% were aware about the daily requirement of fluorosis was <2ppm. 49.54% of participants responded that fluoridated water usage causes fluorosis. 95.41% of participants responded that erupting teeth itself may appear discolored due to

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fluorosis. Conclusion: Thus the current study concludes that the majority of dental students had sufficient knowledge about dental fluorosis but the attitude and practice towards the management of fluorosis was not appreciable.

***Keywords*---**Dental fluorosis, Fluorosis, Knowledge, attitude, dental students, management, Innovative technique, eco-friendly.

Introduction

Dental fluorosis is a condition which occurs due to exposure to fluoride than required (1). The condition begins at the first eight years of life which leads to an eruption of discolored teeth with stains from yellow to dark brown, surface irregularities and noticeable pit (2). The major cause of fluoride in India is due to excess content of fluoride in the local drinking water and even beverages, dental products, dietary supplements and so on (3). The other causes may be the misuse of fluoridated toothpaste as it has 3000ppm of fluoride and mouthwashes whereas the normal toothpaste has only 700ppm of fluoride as the taste of toothpaste appears good children tend to swallow it while brushing (1). Hence parents have to be careful while brushing the teeth. They have to use only pea size paste for brushing (4). As we know that the daily requirement for fluoride is below 2ppm so taking up more fluoride than required for daily requirement leads to fluorosis (5). It can be treated by teeth whitening, composite bonding and Porcelain veneers (6) and prevented by removing fluoridated water and other products and replacing with an alternative and avoiding fluoride rich products in diet (7).

There are studies done by many researches on the management of fluorosis such as Abhay S et al in 2010, Kolar et al in 2018 are all epidemiological studies done in slum area or among local public to determine the Prevalence of fluorosis whereas the current study done to determine the knowledge of dental students in managing fluorosis (8) (9). Certain surveys are also conducted by different authors but the populations are different (10) (11).

The lacunae is that there are fewer studies done on the topic especially there are no survey studies done among dental students with the topic. Hence the aim of the study is to determine knowledge, attitude and practice on the management of fluorosis among dental students.

Materials and Methods

Self-administered questionnaires were designed based on the knowledge, attitude and practice on the management of Fluorosis among the dental students. The questionnaire was distributed through online google forms link, the study population included 100 dental students in Chennai. The participants were explained about the purpose of the study in detail. The questions were carefully studied and the corresponding answers were marked by the participants.The data was collected and statistically analysed in SPSS Version 23.0.The study was approved by the Institutional Review Board.

Result

In the current survey based on the results obtained, 72.48% of second years had participated in the survey (Figure 1) among whom 48.62% were aware about the daily requirement of fluorosis was <2ppm (Figure 2). 49.54% of participants responded that fluoridated water usage causes fluorosis (Figure 3). 95.41% of participants responded that erupting teeth itself may appear discolored due to fluorosis (Figure 4) 77.06% of respondents reported that teeth appear yellow to dark in fluorosis (Figure 5). 64.22% of participants responded that foods to be avoided in fluorosis as jowar (Figure 6) whereas On association between year of study and foods to be avoided in fluorosis was done by chi square test with p value 0.092 (<0.05) which was statistically not significant (Figure. 7). On association between year of study and type of toothpaste you suggest the parents when their children are young age to prevent fluorosis was done by chi square test with p value 0.010 (<0.05) which was statistically significant (Figure 8). 7.34% of participants were not aware that fluorosis stains cannot be removed by scaling (Figure 9). An association between the year of study and treatment for mild fluorosis was done by chi square test with p value 0.001 (<0.05) which was statistically significant (Figure 10). The correlation between year of study and treatment for moderate fluorosis was done by chi square test value p value 0.003 (<0.05) which was statistically significant (Figure 11). The association between year of study and treatment for severe fluorosis was done by chi square test value p value 0.002 (<0.05) which was statistically significant (Figure 12).

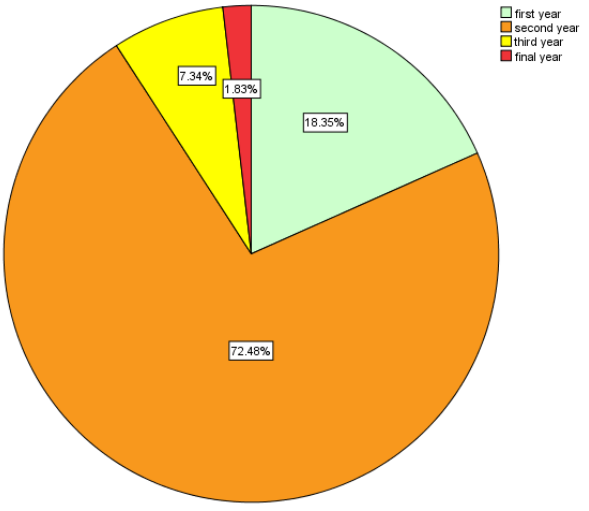

Figure 1: The pie chart illustrates the percentage of participants' year of study. About 72.48% of participants were studying second year (orange), 18.35% of participants were studying first year (light green), 7.34% of participants were studying third year (yellow) and 1.83% of participants were studying final years (red).

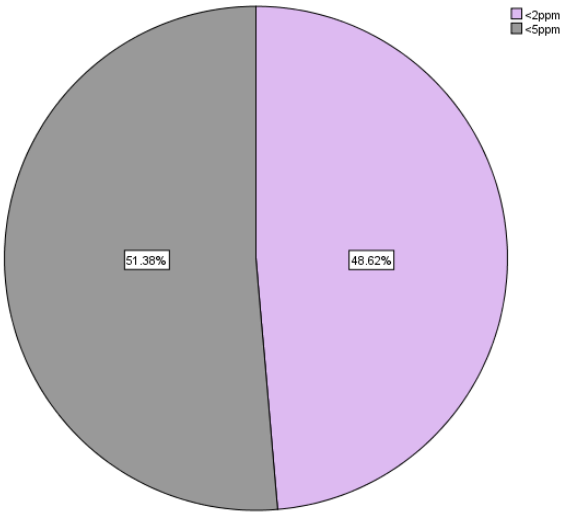

Figure 2: The pie chart illustrates the percentage of responses on daily requirement of fluoride. About 48.62% responded <2ppm (purple) and 51.38% responded <5ppm (grey).

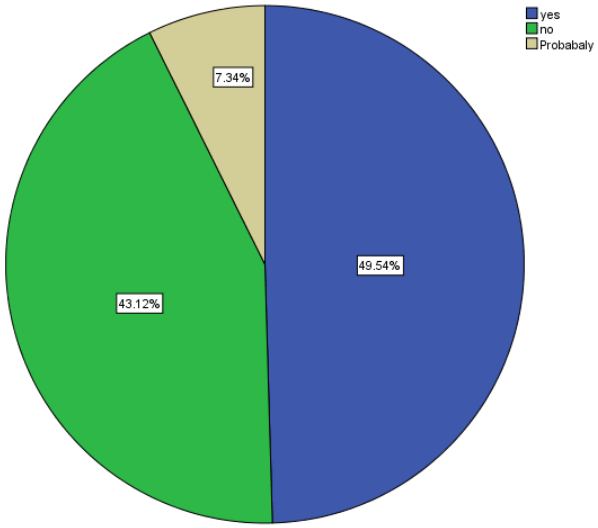

Figure 3: The pie chart illustrates the percentage of responses on fluoridated water usage leads to fluorosis. About 49.54% had responded yes (blue), 43.12% had responded no (green), 7.34% had responded probably (beige).

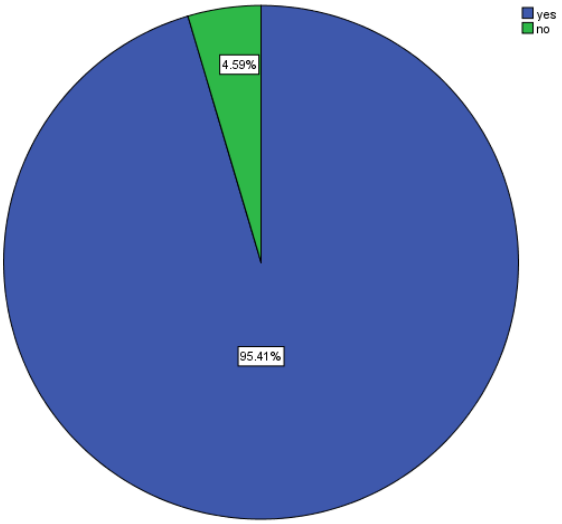

Figure 4: The pie chart illustrates the percentage of responses on erupting teeth may appear discolored due to fluorosis. About 95.41% responded yes (blue) and 4.59% responded no (green).

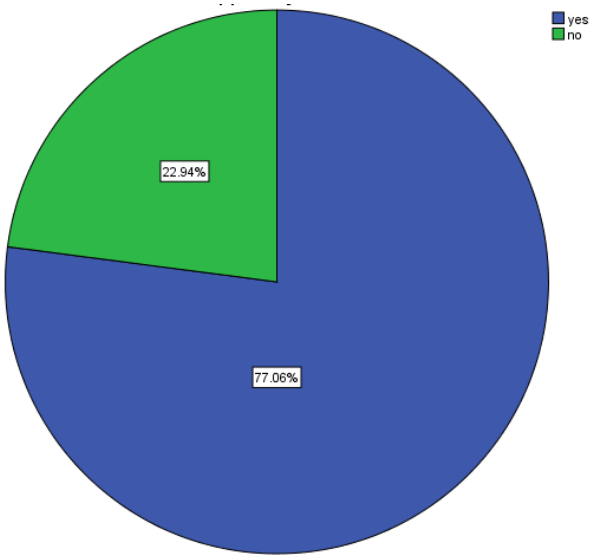

Figure 5: The pie chart illustrates the percentage of responses on teeth that appear yellow to dark in fluorosis. About 77.06% responded yes (blue) and 22.94% responded no (green).

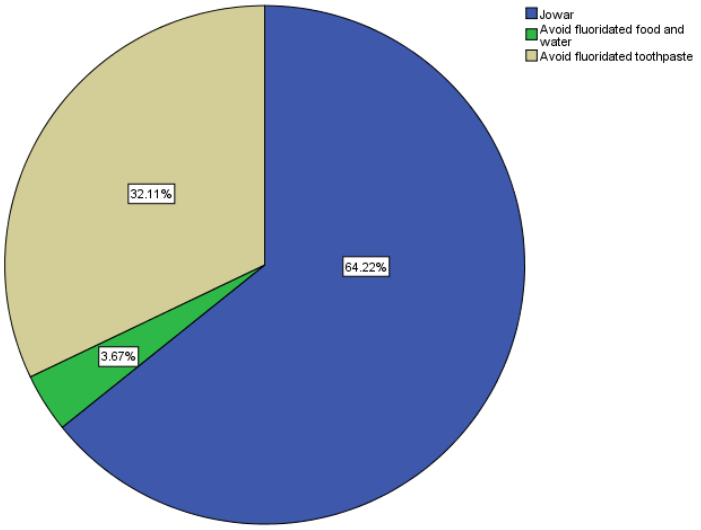

Figure 6: The pie chart illustrates the percentage of responses on foods to be avoided in fluorosis. About 64.22% had responded to jowar (blue), 3.67% had responded avoid fluoridated food and water (green) and 32.11% had responded avoid fluoridated toothpaste (beige).

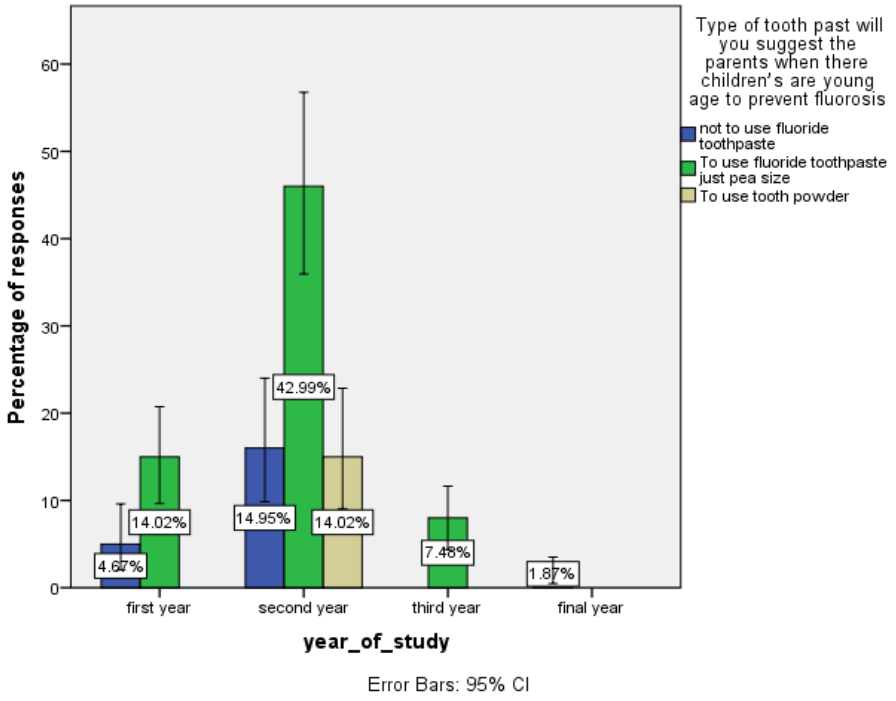

Figure 7: Bar chart depicts the association between year of study and type of toothpaste will you suggest the parents when their children are young to prevent fluorosis. X-axis represents the year of study and Y-axis represents the percentage of responses on the type of toothpaste you will suggest to the parents

when their children are young to prevent fluorosis. Blue signifies not to use fluoride toothpaste, green signifies to use fluoridated toothpaste in pea size and beige signifies to use tooth powder. Majority (42.99%) of second years responded to using fluoridated toothpaste in pea size than first years (14.02%), third years (7.48%) and final years (1.87%). The difference was not statistically significant (Chi-square test; p value =16.826 - statistically not significant).

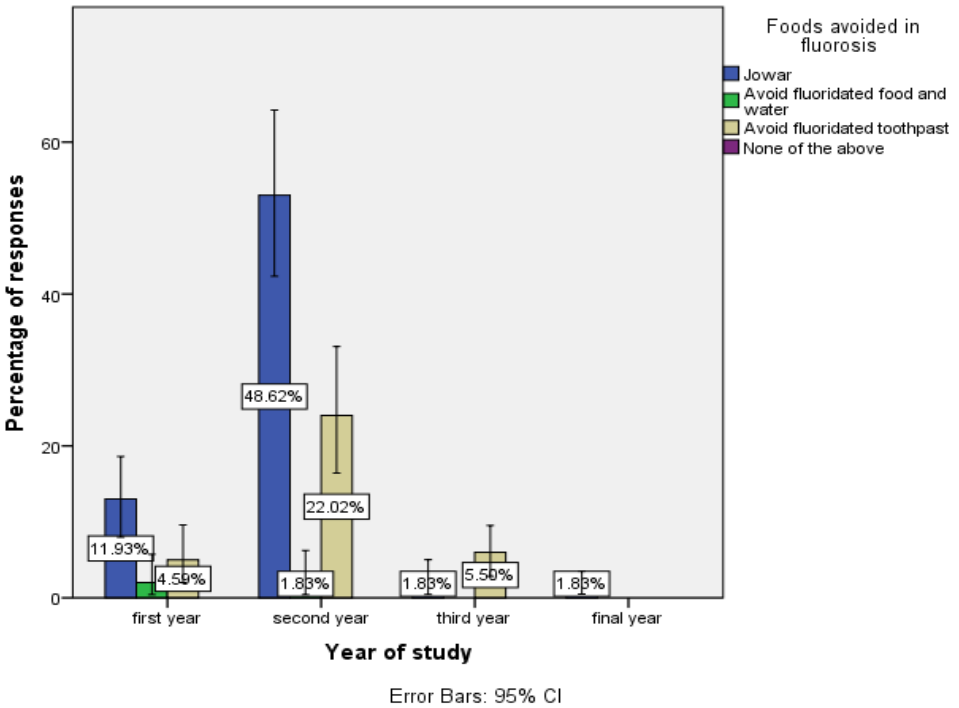

Figure 8: Bar chart depicts the association between year of study and foods to be avoided in fluorosis. X-axis represents the year of study and Y-axis represents the percentage of responses on foods to be avoided in fluorosis. Blue signifies jowar, green signifies avoid fluoridated water and food and beige signifies avoid fluoridated toothpaste. Majority (48.62%) of second years had responded that joware had to be avoided in fluorosis than first years (11.93%), third years (1.83%) and final years (1.83%). The difference was not statistically significant (Chi square test; p value = 0.092 - statistically not significant).

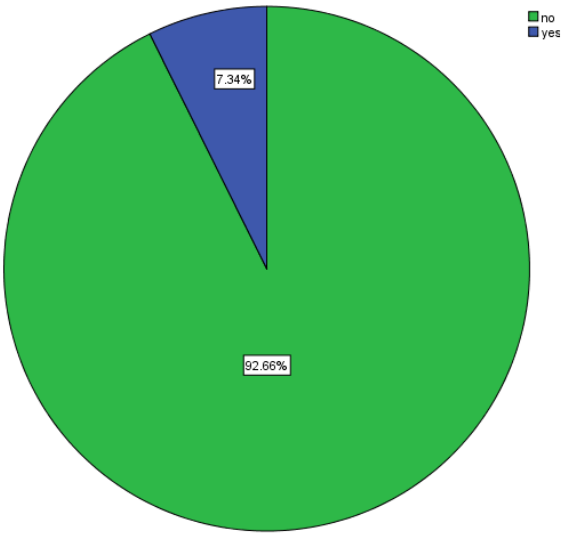

Figure 9: The pie chart illustrates the percentage of responses on scaling can remove the stains caused by fluorosis. About 92.66% responded no (green) and 7.34% responded yes (blue).

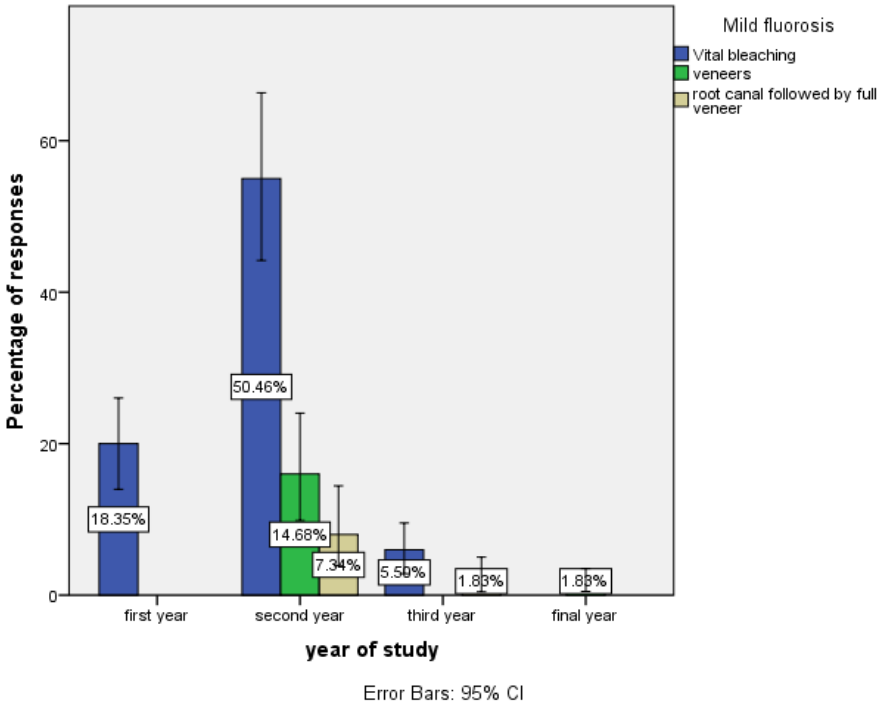

Figure 10: Bar chart depicts the association between year of study and treatment for mild fluorosis. X-axis represents the year of study and Y-axis represents the percentage of responses on treatment of mild fluorosis. Blue signifies Vital bleaching, green signifies veneers and beige signifies root canal treatment followed by full veneers. Majority (50.46%) of second years responded to vital bleaching

than first years (18.35%), third years (1.83%) and final years (1.83%). The difference was statistically not significant (Chi square test; p value = 0.80- statistically not significant).

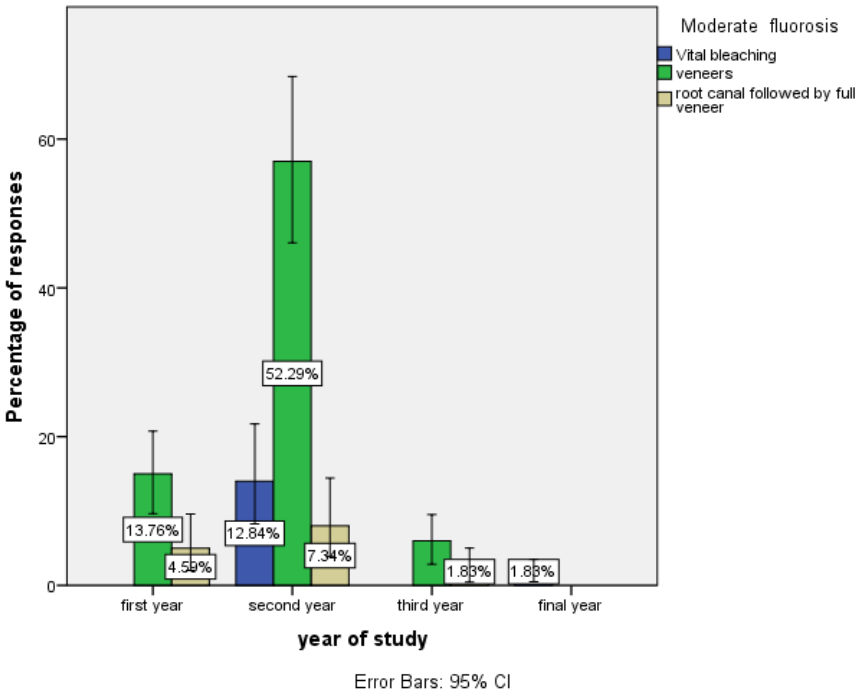

Figure 11: Bar chart depicts the association between year of study and treatment for moderate fluorosis. X-axis represents the year of study and Y-axis represents the percentage of responses on treatment of moderate fluorosis. Blue signifies Vital bleaching, green signifies veneers and food and beige signifies root canal treatment followed by full veneers. Majority (52.29%) of second years responded to veneers than first years (13.76%) and third years (5.50%). The difference is statistically significant (Chi square test; p value= 0.003 - statistically significant).

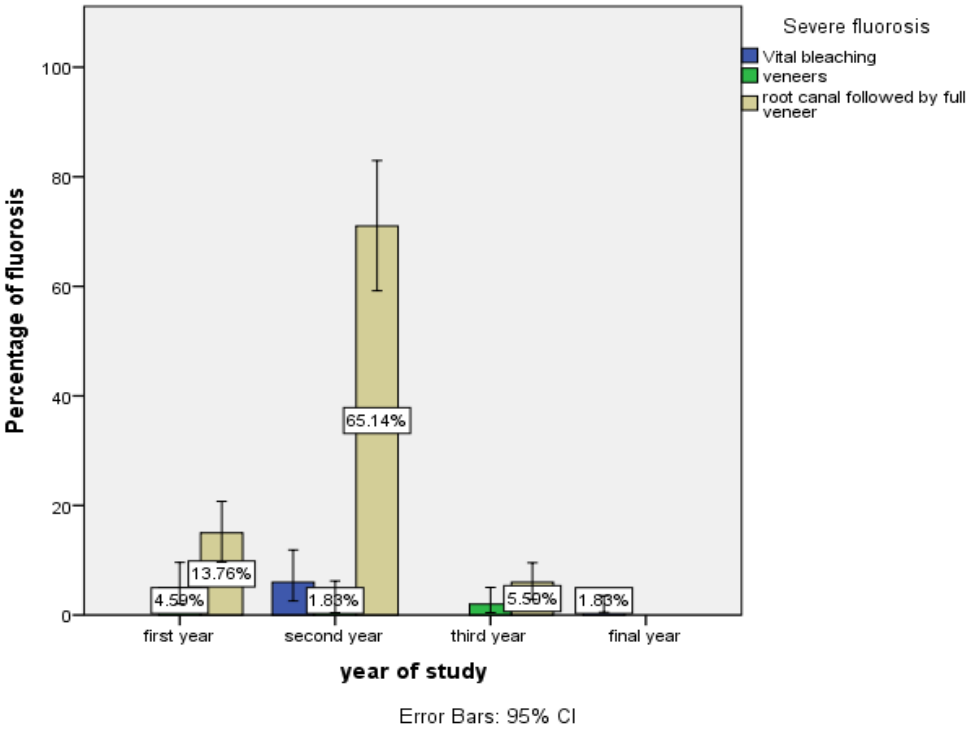

Figure 12: Bar chart depicts the association between year of study and treatment for severe fluorosis. X-axis represents the year of study and Y-axis represents the percentage of responses on treatment of severe fluorosis. Blue signifies Vital bleaching, green signifies veneers and food and beige signifies root canal treatment followed by full veneers. Majority (65.14%) of second years responded to root canal treatment followed by full veneers than first years (13.76%) and third years (5.59%). The difference is statistically significant (Chi square test; p value =0.002-statistically significant).

Discussion

Sami et al., 2015 had conducted a survey among various schools in pakistan and reported that majority of children studying in government school were aware about the causes of fluorosis and the mottled teeth is caused by over exposure of fluoridated water (1) whereas the current study reports that majority of dental students were aware that fluoridated water usage causes fluorosis (Figure 1). Similarly another study done by Shah et al., 2016 had reported that among the south Indian population nearly 30.75% were aware about the causes of fluorosis (12).

Based on the other study done by Prathoshini et al., 2017 had reported that excessive intake of fluoride causes dental and skeletal fluorosis (13) whereas based on the results of the current study majority of dental students were aware about the cause of dental fluorosis (Figure 1).

Based on the results of the current study 71.56% were aware about the vital bleaching for treating mild fluorosis, 84.06% reported the severe fluorosis can be treated by root canal treatment followed by veneer crowns whereas the other study stated that opacity of enamel is more in mild fluorosis compared to severe which is treated with vital bleaching (14).

There are several limitations of the study such as increase in sample size, inclusion of more criteria, survey fatigue, homogenous population and response bias. Future scope of the survey is that more survey and awareness programmes on fluorosis management have to be done to make the upcoming dental professionals to be aware and perform treatment explicitly without complications. Our team has extensive knowledge and research experience that has translated into high quality publications (15–24) (25–28) (29–33) (34).

Conclusion

Within the limitations of the study the majority of dental students had sufficient knowledge about dental fluorosis but the attitude and practice towards the management of fluorosis was not appreciable. More and more awareness programmes to be conducted to improve knowledge and bring a positive attitude towards managing fluorosis among dental students.

Author contribution

Tahoora Taskeen L had done the questionnaire preparation and data collection. Dr. Deepak Selvam and Tahoora Taskeen L had done statistical analysis and manuscript writing. Dr. Deepak Selvam had edited and revised the manuscript of the present study.

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Conflict of interest

The author declares that there was no conflict of interest in the present study.

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