Knowledge, Attitude and Practice Towards the Use of Dental Plaque Disclosing Agent Among Dental Practitioners

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Sathya kumar .M, Dr. Jayashri Prabakar(2022). Knowledge, Attitude and Practice Towards the Use of Dental Plaque Disclosing Agent Among Dental Practitioners *Journal for Educators, Teachers and Trainers***,Vol. 13(6). 309-319.**

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ABSTRACT

Introduction: Dental caries and periodontal diseases,also referred to as plaque mediated diseases, result in poor oral hygiene. Plaque may be a highly specific variable formed by colonization of microorganisms . So plaque isn't easily visible through the eye which is difficult to get rid of , therefore a disclosing agent is employed for removing bacterial plaque and maintaining oral hygiene. Preparations containing disclosing dyes identify dental plaque help in maintaining good oral health. Therefore, the aim of this present study is to evaluate the knowledge, attitude and practice towards the use of dental plaque disclosing agents among dental practitioners and also to create awareness among the people about disclosing agents

Materials And Methods: A descriptive cross sectional hospital based study in the Saveetha Dental College and Hospital (Saveetha University) located in the state of Tamil Nadu. The total sample size arrived was 105. The study population contains adult male and female Dental practitioners between the age of 22 -42. Ethical approval was obtained from the Institutional Review Board in Saveetha University. The first part of the questionnaire contains demographic details which includes age, gender and the second part of the questionnaire contains knowledge , practice toward the use of dental plaque disclosing agents among dental practitioners. Simple random sampling technique was followed. Data was entered in Microsoft excel sheet after collection and was analysed using SPSS software. Descriptive statistics were expressed by means of number ,frequency , and percentage. The level of statistical significance is at $p<0.05$.Statistical software was Statistical software for Social Science ,SPSS version 23.

Result: Majority (52.38%) of the Dental practitioners in the age group between 22-32 years used dental plaque disclosing agent in the dental practice and also felt that the use of this agent improves the oral hygiene maintenance by the patients (64.76%). They also found that patient satisfaction improved after educating them with a disclosing agent.

Conclusion: Based on the results of the present study, it can be concluded that participants in the age group of 22-32 years were found to exhibit more knowledge towards dental plaque disclosing solution and its use in dental practice.

Key Words: Plaque disclosing agents;Dental caries; oral health;Innovative analysis

INTRODUCTION

It is important for maintaining oral health for removal of bacterial plaque , as deposits of bacterial plaque bring about the inflammatory changes which result in the destruction of tissues and also cause cavities in the long term. It's usually transparent and resilient and can't be seen through the eye(1) . It helps in evaluating the knowledge, attitude and practice among dental students regarding disclosing agents. Plaque is clinically defined as a structured, resilient, yellow grayish substance that adheres tenaciously to the intra oral hard surfaces, including removable and glued restoration(1,2).Plaque control is defined as removal of microbial plaque and prevention of its accumulation on the teeth and adjacent gingival tissues. It also deals with the anticipation of calculus formation.

It includes usage of mechanical procedures also as chemical agents which retards plaque formation(3). The mechanical plaque control seems to be the foremost dependable sort of plaque control method and chemical plaque control is used only as an adjunct to mechanical means and not as a substitute(4). Plaque disclosing

solution may be a liquid, lozenge or tablet like substance from which contains a dye or other disclosing agent, which is employed for the identification of dental plaque .The strong and two-way relationship of oral health and therefore the general health of the physical body is now proven . Safeguarding and promoting oral health contributes decisively to maintaining overall health and wellness and will thus be prioritized and improved. The role of public healthcare providers is crucial during this effort(5). Providing experiential education to the general public in reference to oral hygiene at an early age proves to be particularly effective .

A crucial part of this training is the detection and localization of dental dental plaque (DBP), which is the main explanation for the foremost common oral diseases (caries and periodontal disease) . DBP may be a thin, yellowish-white coating (thereafter mentioned as biofilm) which adheres to varied dental surfaces and consists of microbial colonies and products of oral microbial flora metabolism. Biofilm is defined as "bacterial communities that are embedded during a self-produced matrix of extracellular polymeric substances"(6).

Removing biofilm from various areas of the mouth is crucial to oral disease prevention and is achieved through regular personal and professional removal. To be effectively removed with teeth brushing , it must first be accurately detected. Biofilm are often accurately localized with special dyes , mainly iodine, crystal violet , erythrosine, basic fuchsin, fast green, food dyes, fluorescein, and two-tone disclosing agents within the sort of tablets, solutions, wafers, lozenges, or mouth rinses. When taken, these agents color the areas of the mouth where biofilm is present; the intensity of the colour depends on thickness of the plaque (7). The disclosing dyes helpful to (a) establish user's oral hygiene extension, (b) raise awareness of the necessity of disclosing agents, (c) provide personalized instructions and incentives for better oral hygiene, (d) facilitate user self-assessment.

Moreover, their role within the implementation of preventive dentistry programs is especially useful, especially in school-aged children(8). The live visualization of the coloured surfaces of the teeth and tongues of the youngsters participating in these programs facilitates one's understanding of the varied theoretical concepts and medical terms related to them . Also, regarding the experiential education of faculty students, as far because the use of oral hygiene tools cares , biofilm staining allows for better and simpler guidance from healthcare instructors.The most common locations of biofilm are those during which access to and management of oral hygiene tools are difficult(9). Also, biofilm is found where the tongue and saliva natural self-cleaning process doesn't work effectively for a spread of reasons(10).

Studies suggest that biofilm deposits accumulate in larger quantities in irregular areas, "attached gingiva," and therefore the lateral surfaces of the tongue. Finally, disclosing agents is used as plaque identification, it's capable of penetrating the hard plaque deposits and wipe them easily to stay the tooth clean and healthy and It is preventive and disclosing agents to tooth infectious materials(11).Types of Disclosing Agents - There are differing types of exposing agents which are available in day to day life. They aid in removing the unwanted stains on our teeth and gums(12). Our team has extensive knowledge and research experience that has translate into high quality publications(13–21),(22),(23),(24,25),(26),(27),(28–32)The aim of the study is to evaluate the knowledge, attitude and practice towards the use of dental plaque disclosing agents among dental practitioners and also to create awareness among the people about disclosing agents

MATERIALS AND METHOD

Study Design and Study setting
A descriptive cross sectional hospital based study in the Saveetha Dental College and Hospital (Saveetha University).

Sample size estimation
Sample size was estimated using the manual calculation formula (N=Zα2Pq/L2) based on the study done by (11) and the total sample size arrived was 105.

Study Population
The study population contains adult male and female Dental practitioners between the age of 22 -42.

Ethical Approval
Ethical approval was obtained from the Institutional Review Board in Saveetha University.

Data collection
The first part of the questionnaire contains demographic details which includes age, gender and the second part of the questionnaire contains knowledge , practice toward the use of dental plaque disclosing agents among dental practitioners. Data collection can be means of google survey forms. Independent variables will be knowledge and practice among dental practitioners.

Sampling
Simple random sampling technique was followed.

Statistical Analysis

Data was entered in Microsoft excel sheet after collection and was analysed using SPSS software. Descriptive statistics were expressed by means of number ,frequency , and percentage. The level of statistical significance is at p<0.05.Statistical software was Statistical software for Social Science ,SPSS version 23.

RESULT

In our study ,the majority of dental practitioners between the age of 22-32 is about 75.24%, 23.81% of participants between the age of 33-42, 0.95% of participants between the age of above 42 (Figure-1). Majority of the dental practitioners are male about 76.92%,23.08% of participants are female (Figure-2). Majority of the participants in the age of between 22-32,51.92% participants were using disclosing agent in private practice,about 23.08% of participants were not using disclosing agent in private practice. Majority of the participants in the age of between 33-42 ,14.42% of participants were using disclosing agent in private practice,about 9.62% of participants were not using the disclosing agent in private practice. Most of dental practitioners in the age of above 42 were not using disclosing agent in private practice .The Chi square value is 2.81. P value is 0.24 greater than 0.05 which is statistically insignificant. (Figure -3). Majority of the participants in the age of between 22-32,64.42% of participants think that the use of disclosing agents improves oral hygiene maintenance by patients,10.58% of participants think that the use of disclosing agent doesn't improves oral hygiene maintenance by patients. Majority of the participants in the age of between 33-42 ,16.35% of participants think that the use of disclosing agents improves oral hygiene maintenance by patients, about 7.69% of participants think that the use of disclosing agent doesn't improves oral hygiene maintenance by patients. Most of dental practitioners in the age of above 42 think that the use of disclosing agents doesn't improves oral hygiene maintenance by patients. The Chi square value is 8.31. P value is 0.016 greater than 0.05 which is statistically insignificant (Figure-4). Majority of the participants are between the age of between 22-32, 62.14% of participants says that patient is satisfied after educating them with disclosing agents, 12.62% of participants says that patient is not satisfied after educating them with disclosing agents. Majority of the participants in the age of between 33-42 , 14.56% of participants says that patient is satisfied after educating them with disclosing agents, 9.71% of participants says that patient is not satisfied after educating them with disclosing agents. Most of dental practitioners in the age of above 42 says that patient is not satisfied after educating them with disclosing agents. The Chi square value is 9.37. P value is 0.009 less than 0.05 which is statistically significant (Figure-5). Majority of the participants in the age of between 22-32, 60.58% of participants were aware of disclosing agents which can be self applied by patients, 14.42% of participants were not aware of disclosing agents which can be self applied by patients. Majority of the participants in the age of between 33-42 , 15.38% of participants were aware of disclosing agents which can be self applied by patients,14.42% of participants were not aware of disclosing agents which can be self applied by patients. Most of dental practitioners in the age of above 42 were aware of disclosing agents which can be self applied by patients. The Chi square value is 3.41. P value is 0.18 greater than 0.05 which is statistically insignificant (Figure-6). Majority of the participants in the age of between 22-32, 60.58% of participants prefer that applying a disclosing agent before a sealant is to be placed,14.42% of participants doesn't prefer that applying a disclosing agent before a sealant is to be placed. Majority of the participants in the age of between 33-42, 19.23% of participants prefer that applying a disclosing agent before a sealant is to be placed,4.81% of participants doesn't prefer that applying a disclosing agent before a sealant is to be placed. Most of dental practitioners in the age of above 42 doesn't prefer that applying a disclosing agent before a sealant is to be placed. The Chi square value is 4.05. P value is 0.13 greater than 0.05 which is statistically insignificant (Figure -7). Majority of the participants in the age of between 22-32, 60.58% of participants prefer that applying disclosing agent on a tooth coloured restoration, 14.42% of participants doesn't prefer that applying disclosing agent on a tooth coloured restoration. Majority of the participants in the age of between 33-42,15.38% of participants prefer that applying disclosing agent on a tooth coloured restoration, 8.65% of participants doesn't prefer that applying disclosing agent on a tooth coloured restoration. Most of dental practitioners in the age of above 42 prefer that applying disclosing agent on a tooth coloured restoration. The Chi square value is 3.41. P value is 0.18 greater than 0.05 which is statistically insignificant (Figure -8).
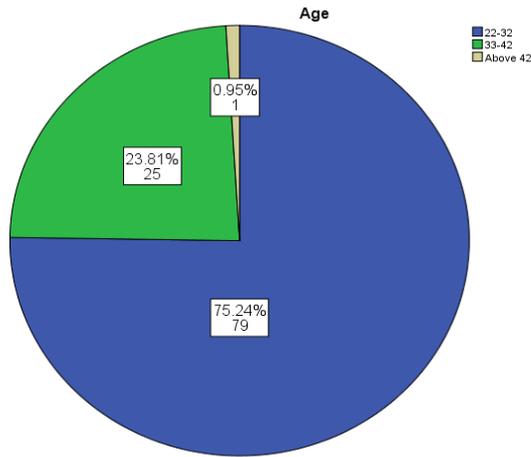
Figure 1 : Pie chart showing the percentage distribution about Dental plaque disclosing agents among Dental practitioners . Whereas, the Blue colour represents age between 22-32is 75.24%, Green colour represents age between 33-42 is 23.81% , the Beige colour represents age between above 42 is 0.95%.
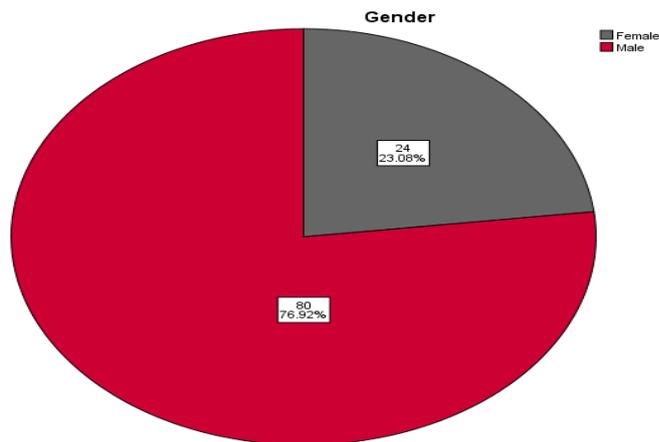

Figure 2 : Pie chart showing the percentage distribution about Dental plaque disclosing agents among Dental practitioners . Wherein, the brown colour represents gender female is 23.08% , Red colour represents gender male is 76.92%.
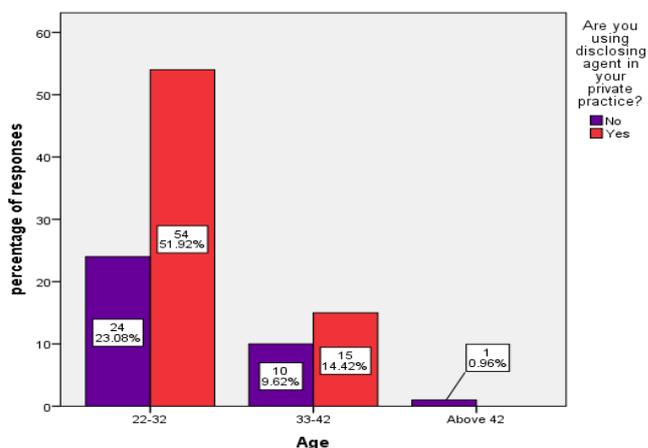

Figure 3 represents the association between the age and the number of responses for the are you using disclosing agents in private practice. The X axis represents the age and the Y axis represents the number of responses.The purple colour represents No and the crimson colour represents Yes. 51.92% of age 22-32 participants responded Yes and 14.42% of age between 33-42 participants responded Yes and 0.96% of age above 42 participants responded No . The Chi square value is 2.81. P value is 0.24 greater than 0.05 which is statistically insignificant.
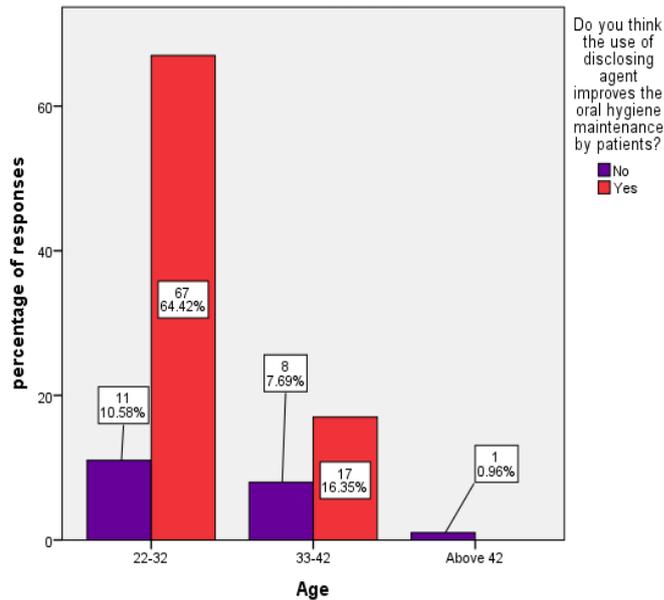
Figure 4 represents the association between the age and the number of responses for the use of disclosing agents to improve oral hygiene. The X axis represents the age and the Y axis represents the number of responses.The purple colour represents No and the crimson colour represents Yes. 64.42% of age 22-32 participants responded Yes and 16.35% of age 33-42 participants responded Yes and 0.96% of age above 42 participants responded No . The Chi square value is 8.31. P value is 0.016 greater than 0.05 which is statistically insignificant.
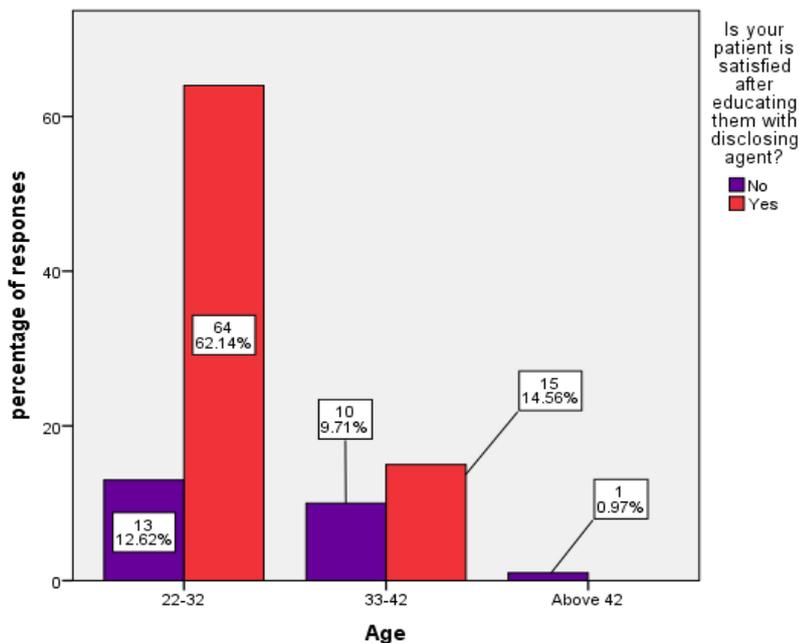

Figure 5 represents the association between the age and the number of responses for the patient's satisfaction after educating with the disclosing agent. The X axis represents the age and the Y axis represents the number of responses.The purple colour represents No and the crimson colour represents Yes. 62.14% of age 22-32 participants responded Yes and 14.56% of age 33-42 participants responded Yes and 0.97% of age above 42 participants responded No . The Chi square value is 9.37. P value is 0.009 less than 0.05 which is statistically significant.
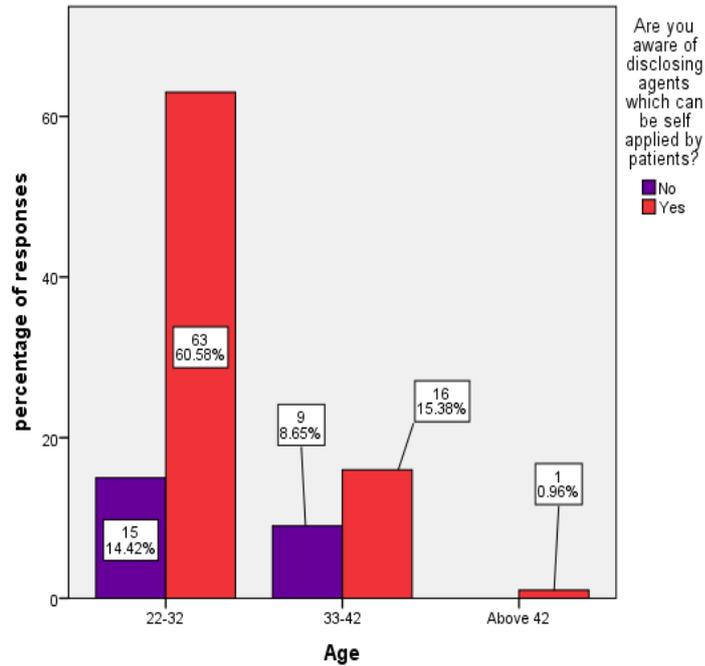
Figure 6 represents the association between the age and the number of responses for the disclosing agents which can be self applied. The X axis represents the age and the Y axis represents the number of responses.The purple colour represents No and the crimson colour represents Yes. 60.58% of age 22-32 participants responded Yes and 15.38% of age 33-42 participants responded Yes and 0.96% of age above 42 participants responded Yes . The Chi square value is 3.41. P value is 0.18 greater than 0.05 which is statistically insignificant.
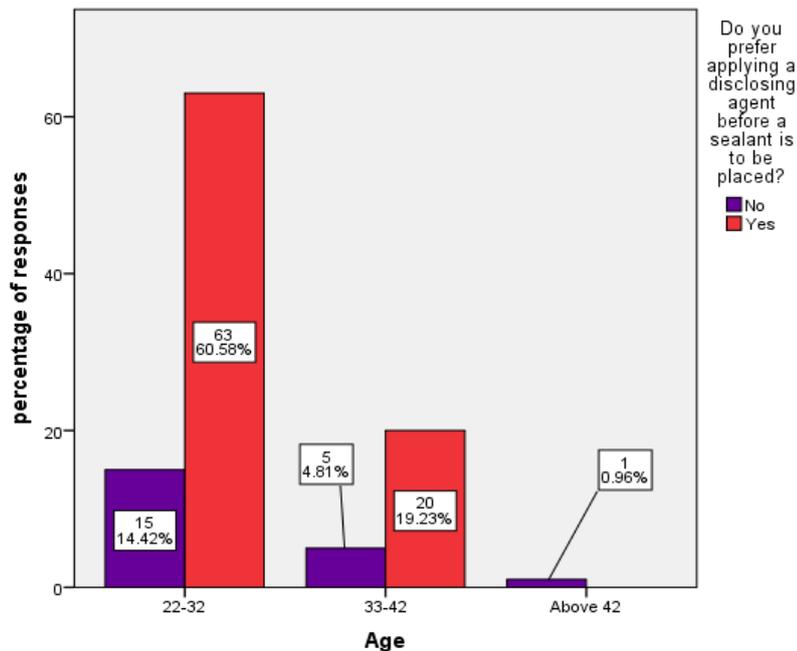

Figure 7: represents the association between the age and the number of responses for the applying disclosing agents before a sealant to place. The X axis represents the age and the Y axis represents the number of responses.The purple colour represents No and the crimson colour represents Yes. 60.58% of age 22-32 participants responded Yes and 19.23% of age 33-42 participants responded Yes and 0.96% of age above 42 participants responded No.The Chi square value is 4.05. P value is 0.13 greater than 0.05 which is statistically insignificant.

Figure 8: represents the association between the age and the number of responses for the applying disclosing agent on a tooth colour restoration . The X axis represents the age and the Y axis represents the number of responses.The purple colour represents No and the crimson colour represents Yes. 60.58% of age 22-32 participants responded Yes and 15.38% of age 33-42 participants responded Yes and 0.96% of age above 42 participants responded Yes . The Chi square value is 3.41. P value is 0.18 greater than 0.05 which is statistically insignificant.
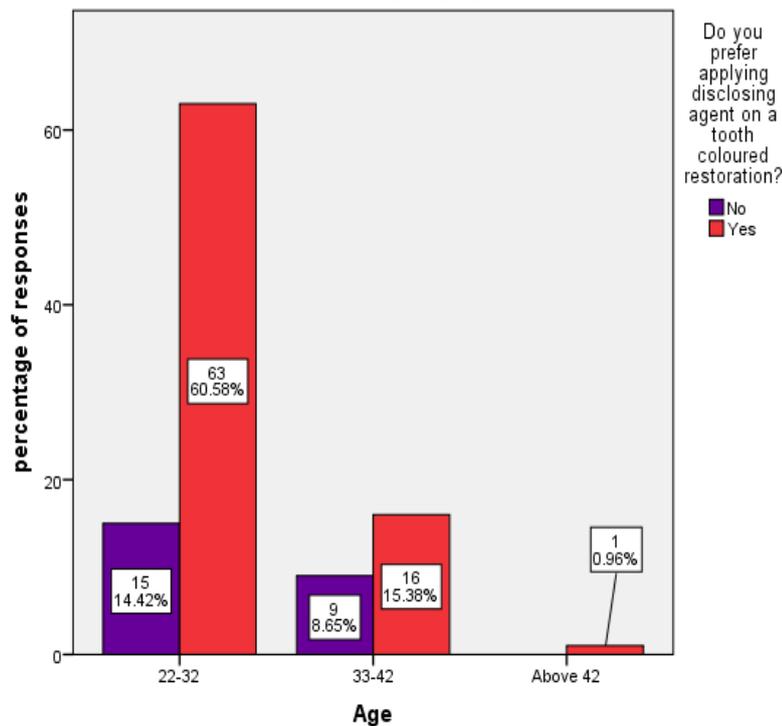
DISCUSSION

In the present study,the association between the age and the number of responses for are you using disclosing agents in private practice. 51.92% of age 22-32 participants responded Yes and 14.42% of age 33-42 participants responded Yes and 0.96% of age above 42 responded No . The Chi square value is 2.81. P value is 0.24 greater than 0.05 which is statistically insignificant. The association between the age and the number of responses for the use of disclosing agents to improve oral hygiene.64.42% of age 22-32 responded Yes and 16.35% of age 33-42 responded Yes and 0.96% of age above 42 responded No . The Chi square value is 8.31. P value is 0.016 greater than 0.05 which is statistically insignificant.The association between the age and the number of responses for the patient's satisfaction after educating with the disclosing agent .62.86% of age 22-32 responded Yes and 14.29% of age 33-42 responded Yes and 0.95% of age above 42 responded No . The Chi square value is 9.37. P value is 0.009 less than 0.05 which is statistically significant. This is the only one statistically significant.

The association between the age and the number of responses for the disclosing agents which can be self applied . 62.14% of age 22-32 responded Yes and 14.56% of age 33-42 responded Yes and 0.97% of age above 42 responded Yes . The Chi square value is 3.41. P value is 0.18 greater than 0.05 which is statistically insignificant. The association between the age and the number of responses for the disclosing agents which can be self applied . 60.58% of age 22-32 responded Yes and 15.38% of age 33-42 responded Yes and 0.96% of age above 42 responded No . The Chi square value is 4.05. P value is 0.13 greater than 0.05 which is statistically insignificant. The association between the age and the number of responses for the applying disclosing agent on a tooth colour restoration. 60.58% of age 22-32 responded Yes and 15.38% of age 33-42 responded Yes and 0.96% of age above 42 responded Yes . The Chi square value is 3.41. P value is 0.18 greater than 0.05 which is statistically insignificant.

In the previous study,Biofilm associated with plaque forms a layer which causes decreased oral hygiene . Biofilm detection points were recorded. The study did not find any differences in biofilm detection points between boys and girls.Age groups in which were classified according to educational level, show significant variations in biofilm detection points. At preschool age, an increased presence of biofilm is found on the upper anterior lingual and lower posterior buccal surfaces. This is probably because at this age, there is insufficient preventive dentistry training and skills in using oral hygiene tools. These reasons also affect differences between primary school children and secondary school children as well as the superiority of detecting biofilm on the

upper anterior lingual surface of the preschool and primary school children.Important differences in biofilm detection points between foreigners and Greek schoolchildren were investigated. The specific locations of biofilm in foreign schoolchildren (upper anterior labial, upper anterior lingual, upper posterior palatal, and lower posterior buccal surfaces) and in Greek schoolchildren (lower posterior buccal surface)(5).

Another study is related to the location of dental plaque according to BMI. In the group of overweight and obese children, dental plaque seemed to be concentrated on the upper posterior occlusal and buccal surfaces, as well as on the lower posterior occlusal surface. These findings are unique, as relevant to previous study. However, it could be assumed that biofilm localization on these surfaces, where one can expect biofilm to be removed by natural cleansing,may be because over- weight and obese children tend to swallow rather than chew their food,leads to limiting of self cleaning process . Nevertheless association studies between BMI, oral hygiene, and gingivitis in schoolchildren show conflicting results in these studies. In these study also highlighted the extremely high level of biofilm on the tongue, which is not affected by the presence or absence of dental caries. Thus, biofilm on the dorsal surface of the tongue can be independent and is not associated with that on the dental surface. Matsui's study argues that tongue cleaning has no obvious contribution to inhibiting dental plaque formation .Generally, this research is to the schoolchildren who were observed to be ignorant of the need to clean their lingual surfaces. These supports the relationship between periodontal disease and biofilm localisation(33). Thus, these study's findings may be used to guide schoolchildren, teachers, and parents or guardians in the right and efficient use of oral hygiene tools and as a basis for designing new research.

In the previous study, the Dental practitioners were not much aware of disclosing agents but they know about what is disclosing agents(34). Most of them were not using disclosing agents in private practice. People were not much aware of disclosing agents. Most of them prefer not to say to the patients that disclosing agents can be self applied. Most of the dental practitioners above the age of 33-42 are less aware of disclosing agents. Some dental practitioners above 42 are not aware of disclosing agents(33,35). The age between 22-32 around 52.39% of people are more aware of disclosing agents. The age between 33-42 around 15.34% of people were aware of disclosing(36). The young age people between 22-32 were using the disclosing agents in private practice. The ages between 33-42 were not much using disclosing agents in private practice. Majority of dental practitioners between the age of 22-32 were more aware of dental plaque disclosing agents and the age between 33-42 were less aware of disclosing agents.

CONCLUSION

Based on the results of the present study, dental practisioners in the age group of 22-32 years were found to exhibit more knowledge towards dental plaque disclosing solution and its use in dental practice. Identification of bacterial plaque with the assistance of exposing solution is one among accurate, easiest and fastest ways to look at bacterial plaque . It favours subsequent removal of the plaque. Self checking with plaque disclosing agents may play an important role in improving the right oral hygiene in children . However, further investigation is required alongside the establishment of public health programs that specialize in the importance of proper oral hygiene to limit inequalities and ignorance about oral hygiene.

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