Knowledge and Attitude on The Use of Nano Particle Based Herbal Mouthwash Among Dental Students – A Survey

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Abstract: Many investigations have pointed out widespread use of the herbal based nano system in various domains of dentistry such as prevention, prognosis, care, tissue regeneration and restoration. Nano material in mouthwashes to improve oral health performance. The main aim of the research to assess the knowledge and attitude on the use of nanoparticle based herbal mouthwash among dental students. A questionnaire based survey was conducted online among dental students regarding their knowledge and awareness about the mouth washing habits and awareness about nano based herbal mouthwashes. Total students participated: 100. Total questions asked: 13. Spss analysis with chi-square test is done for analysis. From the results it’s evident that among the total (100) students participating in the survey 51.52% were female, 48.48% male.83.84% of students were using mouthwash daily. 86.87% students prefer herbal mouthwash, 56.57% students were aware about nanoparticles, 79.80% students are aware about the purpose of using mouthwash, 18.18% students used nano particle mouthwash. 54.55% of students didn’t have dental problems. 56.57% of students, dentists motivate them to use mouthwash. 84.85% of students know that mouthwash has greater ability to reduce bacteria in the mouth, 78.79% of students know the usage of mouthwash in reducing dental caries. Among all students, 57.58% are aware about nano based herbal mouthwashes. This study concluded that more of them are aware about nanoparticle based herbal mouthwashes.

Keywords: Awareness, Mouthwash, Herbal, Nanoparticle, knowledge, dental students.

INTRODUCTION
Dental health is one of the aspects of human health that are often missed [(A and Gupta, 2018)]. Dental health problems in general are cracked cavities tooth the onset hygiene, an inevitable part personnel hygiene practices is a very important factor in maintaining the personal hygiene such as brushing techniques flossing and mouth rinsing habits[(Monsen, no date)] (Miller, Vandome and John, 2010)]. Out of all mouth washing habit plays a vital role in maintaining oral hygiene [(Institute and National Cancer Institute, 2020a)] [(Institute and National Cancer Institute, 2020c)]. If not, it leads to various dental problems [(Ashwini, Ezhilarasan and Anitha, 2017)] [(Rajeshkumar, Agarwal, et al., 2018)]. Due to bacterial accumulation on the surface of the tooth which creates caries. There are many mouthwashes available in the market which can be from a natural source and also from nanoparticles [(Institute and National Cancer Institute, 2020b)] [(Afkhami et al., 2015; Institute and National Cancer Institute, 2020b)]. Nano based herbal mouthwashes which have been proved to be efficient in many areas of dentistry were used as mouthwash and proven to decrease the pathogenic oral bacteria. Nano based herbal mouthwash is expected to show profitable growth in recent years because of growing professional recognition on nano based mouthwashes [(Ezhilarasan, Lakshmi, Nagaich, et al., 2017)] [(Rajeshkumar, Venkat Kumar, et al., 2018)]. Nanoparticles size ranging from 1 to 100 nm successfully used in many products of day today life [(Anitha and Ashwini, 2017)] [(Mehta et al., 2019)]. Nanoparticle is a promising novel alternate for dentistry [(Karthiga, Rajeshkumar and Annadurai, 2018)] [(Koch, 1967)]. Dental problems can arise because of the lack of minerals in the teeth and dental porous structure [(Inc. and Kernel Networks Inc., 2019)]. With regards to the small pore size, nanotechnology is an effective solution to deal with this. Use of mouthwash is very effective because of its ability to clean areas which are difficult with tooth brush and can damage the formation of plague [(Lakshmi et al., 2015)] [(Perumalsamy et al., 2018)]. The main purpose of the filling of innovation based mouthwash by using phytomedicine in nanotechnology is to produce dental health care products that are natural and effective for management of dental health [(Sharma et al., 2019)] (Ezhilarasan, Lakshmi, Vijayaragavan, et al., 2017; Sharma et al., 2019)]. The main aim of the research to assess the
knowledge and attitude on the use of nanoparticle based herbal mouthwash among dental students. Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarsaran, 2018; Ezhilarsaran, Sokal and Najimi, 2018a; Jeevanandan and Govindaraju, 2018; J et al., 2018; Menon et al., 2018; Prabakar et al., 2018; Rajeshkumar, Kumar, et al., 2018; Vishnu Prasad et al., 2018; Wahab et al., 2018; Dua et al., 2019; Duraisamy et al., 2019; Ezhilarsaran, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarsaran, 2019a; Malli Sureshbabu et al., 2019; Mehta et al., 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran et al., 2019; Rajeshkumar et al., 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma et al., 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi et al., 2020; Samuel, Acharya and Rao, 2020).

MATERIALS AND METHODS

A questionnaire based survey was conducted online among dental students regarding their knowledge and awareness about the mouth washing habits and awareness about nano based herbal mouthwashes. The questionnaire was conducted via online. No human and animal ethical approval needed because it’s a purely online based survey. It is a general health survey enquiring about nanoparticle mouthwash and health awareness among dental students and preferences for oral hygiene.

Questionnaire:
* Name
* Gender
* Are you using mouthwash daily
* What kind of mouthwash do you prefer
* Did you use nanoparticles mouthwash before
* Do you know about nanoparticles
* Are you aware about the purpose of mouthwash
* Do you have any dental problems
* Did your dentist motivate you to use mouthwashes
* Do you know that mouthwashes have greater ability to reduce bacteria in mouth
* Did you know the usage of mouthwashes in reducing risk of dental caries
* Are you aware about nano herbal mouthwashes
* Personal preference of oral hygiene

RESULT

From the results it’s evident that among the total (100) students participating in the survey 51.52% were female, 48.48% male (Figure 1). 16.16% of students are not using mouthwash daily , 83.84% of students were using mouthwash daily (Figure 2). 86.87% students prefer herbal mouthwash, 13.13% prefer chemical mouthwashes (Figure 3). 56.57% students were aware about nanoparticles, 43.43% students were not aware about nanoparticles (Figure 4). 79.80% students are aware about the purpose of using mouthwashes, 20.20% are not aware about it(Figure 5). 18.18% students used nano particle mouthwash and 81.82% students didn’t use nano particle mouthwash before (Figure 6). 54.55% of students didn’t have dental problems,45.45% didn’t have dental problems (Figure 7). 56.57% students, dentists motivate them to use mouthwash 43.43% students didn’t motivate them (Figure 8). 84.85% know that mouthwash has greater ability to reduce bacteria in the mouth, 15.15% don’t know about it (Figure 9). 78.79% students who know the usage of mouthwash in reducing dental caries, 21.21% are not aware about it (Figure 10). Among all students 57.58% aware about nano based herbal mouthwashes, 42.42% is not aware (Figure 11). Among all personal preferences, brushing 28.28%, mouthwash 18.18%, both 53.54% (Figure 12). Bar graph represents the association between gender and awareness about using mouthwash daily. X-axis represents the gender and Y-axis represents the percentage of awareness about using mouthwash daily. Chi-square test was done and association was found to be statistically not significant. Pearson’s chi square value=1.501, DF=2, (P value > 0.05). Hence there is no significance(Figure 13).

Bar graph represents the association between gender and preference of herbal and chemical mouthwash. X-axis represents the gender and Y-axis represents the percentage of preferences about herbal and chemical mouthwash. Chi-square test was done and preferences were found to be statistically not significant. Pearson’s chi square value=0.172, DF=2, (P value > 0.05). Hence there is no significance(Figure 14). Bar graph represents the association between gender and awareness about nano based herbal mouthwashes. X-axis represents the gender and Y-axis represents the percentage of awareness about nano based herbal mouthwashes. Chi square test was done and association was found to be statistically not significant. Pearson’s chi square value=0.925, DF=1 (P value >0.05). Hence there is no significance (Figure 15). Bar graph represents the association between gender and personal preference of Brushing, Mouth Washing or both. X-axis represents the gender and Y-axis represents the percentage of personal preferences about brushing, mouth washing and both. Chi square test was done and association was found to be statistically not significant. Pearson’s chi square =1.541, DF=2, (P value > 0.05)(Figure 16).
DISCUSSION
The use of mouthwash is an imperative aspect of oral care prevention, treatment of oral diseases. Dental and oral hygiene has been done by brushing teeth, but all that was not enough because the mouth has a complex environment and microbiota, so the use of mouthwash is indispensable.[Ezhilarasan, Sokal and Najimi, 2018b]. Gargle with mouthwash can eliminate bacteria between teeth that are not reached by the toothbrush. Mouth Washing the oral cavity with nano based herbal mouthwash helps to maintain the moisture in the mouth, removes remaining debris and reduces accumulation of plaque and infection.[Ezhilarasan, 2018] [(Lakshmi et al., 2018)]. However, Nano Based herbal mouthwashes are found to be comparably effective with the advantage of being safer. In our study most of them prefer herbal mouthwashes when compared to chemical mouthwash. Most of the participants preferred mouthwashing and brushing to use both for good Oral hygiene. Studies have said that the use of Nano Based herbal mouthwashes has become a routine part of daily infection control procedures.[(Gheena and Ezhilarasan, 2019b)]. Most of the participants are aware about mouthwashes protecting oral cavity from many oral diseases. Lot of variation exists in the type of mouthwashes prescribed there way of use, duration and efficiency perceived by various practitioners, specialists and patients should be properly told about the proper oral care and importance of outcome. There is a need for extensive research for the standardization and popularity of nano based herbal mouthwash among the population. The main aim of the research to assess the knowledge and attitude on the use of nanoparticle based herbal mouthwash among dental students. Our institution is passionate about high quality evidence based research and has excelled in various fields ([Pc, Marimuthu and Devadoss, 2018; Ramesh et al., 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai et al., 2019; Sridharan et al., 2019; Vijayashree Priyadharsini, 2019; Mathew et al., 2020)]

CONCLUSION
This study concluded that more of them are aware about nanoparticle based herbal mouthwashes. Mouthwashes are safely used by the majority of the population. Most people avoiding chemical mouthwashes prefer herbas for safety. Majority of them are willing to use nano based herbal mouthwashes, if it is recommended by professionals. Through this survey we would like to stress upon the need for extensive and active dialogue between the various treating specialists to reach a consensus on the use of nano based herbal mouthwashes.

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Fig. 1: The pie chart shows the distribution of Gender among the total students (100). 51.52% females (Green), 48.48% males (Blue).

Fig. 2: The pie chart shows the awareness of using mouthwash among the students (100). Based on the survey 16.16% are aware (Blue) and 83.84% are not aware (Green) of using mouthwash.
Fig. 3: The chart shows the preference of mouthwash among the students (100). Based on the survey 86.87% prefer herbal mouthwash (Blue), 13.13% prefer chemical mouthwashes (Green).

Fig. 4: The Pie chart shows the distribution of awareness about nano particles among the students (100). Based on the survey 56.57% are aware about nanoparticles (Blue), 43.43% are not aware about nanoparticles (Green).
Fig. 5: The pie chart shows the distribution of awareness about the purpose of mouthwash among the students (100). Based on the survey, 79.80% are aware (Blue) and 20.20% are not aware about the purpose and uses of mouthwash (Green).

Fig. 6: The pie chart shows the use of nanoparticle mouthwash among the students (100). Based on the survey, 18.18% used nanoparticle mouthwashes (Blue) and 81.82% didn't use nanoparticle mouthwashes (Green).
Fig. 7: The pie chart shows the total number of students suffering from dental problems among all (100). Based on the survey 45.45% of them have dental problems (Blue), 54.55% don't have dental problems (Green).

Fig. 8: The pie chart shows that if the dentist had motivated the participant to use mouthwashes. Based on the survey 56.57% of their dentists motivated them to use mouthwash (Blue), 43.43% of their dentists didn’t motivate them (Green).
Fig. 9: The Pie chart shows the distribution of awareness of mouthwash having a greater ability to reduce bacteria, among the students (100). Based on the survey 84.85% know that mouthwash has a greater ability to reduce bacteria in the mouth (Blue), 15.15% are not aware that mouthwash has a greater ability to reduce bacteria (Green).

Fig. 10: The Pie chart shows the awareness of usage of mouthwash in reducing the risk of dental caries among the students (100). Based on the survey 78.79% know the usage of mouthwash in reducing dental caries (Blue), 21.21% are not aware about the usage of mouthwash in reducing the risk of caries (Green).
Fig. 11: The Pie chart shows the awareness about the nano herbal mouthwash among the students (100), 57.58% aware about nano based herbal mouthwashes (Blue), 42.42% is not aware about the nano herbal mouthwash (Green).

Fig. 12: The Pie chart shows the personal preference of brushing, mouth washing, both among total students (100). Based on the survey, for the majority of participants, personal preference of oral hygiene was to perform brushing and using mouthwash 53.54% (Cream).
Fig. 13: Bar graph represents the association between gender and awareness about using mouthwash daily. X-axis represents the gender and Y-axis represents the number of responses. Majority of females (38.38%) are aware (blue) about using mouthwash daily than males (38.38%). Chi square test was done and association was found to be statistically not significant. Pearson’s chi square value = 1.501, DF = 2, (P value > 0.05). Both male and female participants were equally aware about the use of mouthwash.

Fig. 14: Bar graph represents the association between gender and preference of herbal and chemical mouthwashes. X-axis represents the gender and Y-axis represents the number of responses. Majority of females (45.45%) prefer herbal (blue) mouthwash when compared to males (41.41%). Chi-square test was done and preferences were found to be statistically not significant. Pearson’s chi square value = 0.172, DF = 2, (P value > 0.05). Hence there is no significant association between gender and preference of mouthwash.
Fig. 15: Bar graph represents the association between gender and awareness about nano based herbal mouthwashes. X-axis represents the gender and Y-axis represents the number of responses. Majority of males (30.30%) are aware (blue) of the nano based herbal mouthwashes than females (27.27%). Chi square test was done and the association was found to be statistically not significant. Pearson’s chi square value = 0.925, DF = 1, (P value > 0.05). Hence there is no significant association between gender and awareness about nano based herbal mouthwash.

Fig. 16: Bar graph represents the association between gender and personal preference of Brushing, Mouth Washing or both. X-axis represents the gender and Y-axis represents the number of responses. Majority of the male and female participants personally preferred brushing and the use of mouthwash (cream). Chi square test was done and association was found to be statistically not significant. Pearson’s chi square = 1.541, DF = 2, (P value > 0.05). Hence there is no significant association between gender and personal preference of oral hygiene.