KNOWLEDGE, ATTITUDE AND PRACTICE OF USING HERBAL AND CHEMICAL TOOTHPASTE AMONG VIJAYAWADA POPULATION

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ABSTRACT

Careful and frequent brushing with toothbrush and paste helps to prevent build-up of plaque on the teeth. Chemical toothpastes is the most widely used tooth cleansing agent, but now there has been a paradigm shift towards herbal toothpastes owing to the increased awareness regarding the side effects associated with the chemicals used.The purpose of this study is to evaluate the awareness of various herbal and chemical tooth cleaning agents. This is a cross-sectional descriptive survey that was conducted among hundred people in Vijayawada. The survey consists of 15 self administrative questions. This is a simple random method of sampling.84.62% of the population are aware of oral hygiene. 51.28% of the population are aware of the herbal toothpaste.55.56% of the population use separate toothpaste for the children.From the statistical results we can conclude that there is a average knowledge and awareness about the various chemical and herbal oral hygiene aids . The lack of proper practice of these oral hygiene measures can be restored by initiating awareness among the population inorder to reduce the burden of the various oral diseases.

Keywords : Oral hygiene, herbal toothpaste, plaque, chemical toothpaste, neem.

Introduction

Dental caries is the most common chronic disease worldwide. Over 80% of cavities occur inside fissures in teeth where brush cannot reach food left trapped after eating. Saliva and fluoride have no access to neutralize acid and remineralize demineralized teeth, unlike the self cleansing parts of the tooth, where fewer cavities occur.[1][2][3] Teeth cleaning helps to remove plaque and tartar from the teeth in order to prevent gingivitis,tooth decay, periodontitis etc.[4,5] Tooth plaque, also known as dental biofilm, is a sticky, yellow film comprising of a wide range of bacteria which attaches to the cervical region of the tooth.[6] It starts to reappear just minutes after the tooth surface has been cleaned, hence regular brushing is encouraged.

A high-sugar diet encourages the formation of plaque. Fermentable carbohydrate is converted into acid by the bacteria in the plaque and this acid then causes the dissolution of the inorganic substance and degeneration of the organic matrix leading to formation of dental caries.[7] It is commonly acknowledged that oral cleanliness is done through ordinary expulsion of dental plaque and food

stores which is a fundamental factor for causing caries in the tooth. [8,9]Technique for oral hygiene varies from nation to nation and culture to culture. Many people in olden days used natural tooth cleaning agents like chewing sticks .Whereas nowadays there is a huge development in the modern techniques in dentistry. Even now sticks and natural methods are being followed in many developing countries due to their old traditional practices.[10,11] There are several natural ways of cleaning the teeth like coconut oil pulling, apples cider vinegar, activated charcoal, lemon, orange or banana peel.

Chemical toothpastes is the most widely used tooth cleansing agent. But it contains certain chemicals like Sodium benzoate, methylparaben, and ethylparaben as preservatives which can cause potential toxicity.[12][13]. Hence now a days there is lot of advocating for herbal toothpaste which seems to be a wise and healthier choice for those who would like to minimize the amount of chemicals that could potentially endanger your general health.[14] The all natural solutions in organic toothpaste contain natural antibacterial ingredients such as spearmint and peppermint oils. These help to eliminate bacteria and keep your mouth healthy.

Oral hygiene plays an important role in the well-being of a person.A thrust on oral hygiene practices is important because oral health is a reflection of systemic health. Due to lack of oral hygiene there has been an increase in the number of oral diseases like gingivitis, periodontitis, tooth sensitivity, reactive lesions and also oral cancers.[15–18]). Hence creating awareness among the general population about the need for good oral hygiene is the need of the hour.

Numerous studies have been undertaken in the institution which has concentrated on recent technological advancements in dentistry.[19–24] Many surveys have also been conducted inorder to create awareness about oral health and diseases.[24–29]. These studies helped in forming a platform which enabled the current survey on creating awareness about various natural and chemical toothpastes among the Vijayawada population.

Materials and methods

This is a cross sectional descriptive survey conducted among 100 adults aged between 25-50 in Vijayawada.This survey consists of 15 self administered questions. The survey was conducted through an online platform. The survey was easy to create and the data was gathered among heterogeneous populations. The questionnaire was approved by the review board of saveetha dental college chennai. To eliminate the response bias we did simple random sampling .The collection was done using google forms. Followed by tabulation of data using excel sheets. The descriptive statistics, frequency analysis and association was done using SPSS software version 20.0. Chi square test was done using SPSS. Result was depicted using pie charts and bar graphs.

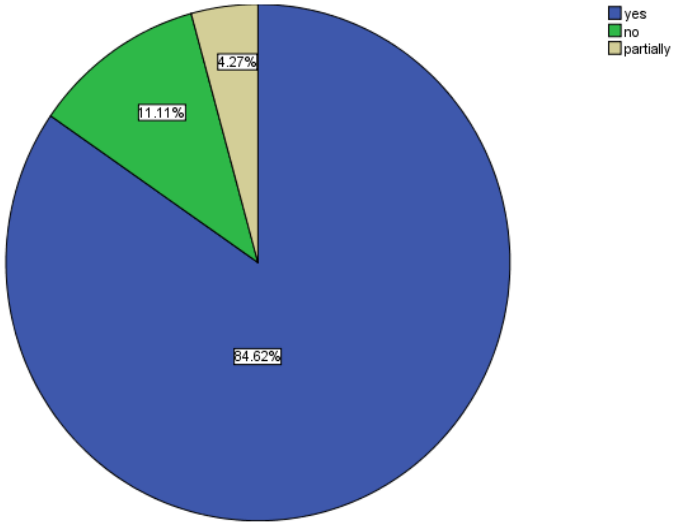

Figure 1: pie chart depicting the oral hygiene awareness among the participants 84.62% are aware of oral hygiene (Blue),11.11% are not aware of oral hygiene (green), 4.27% have partial awareness of oral hygiene(grey).

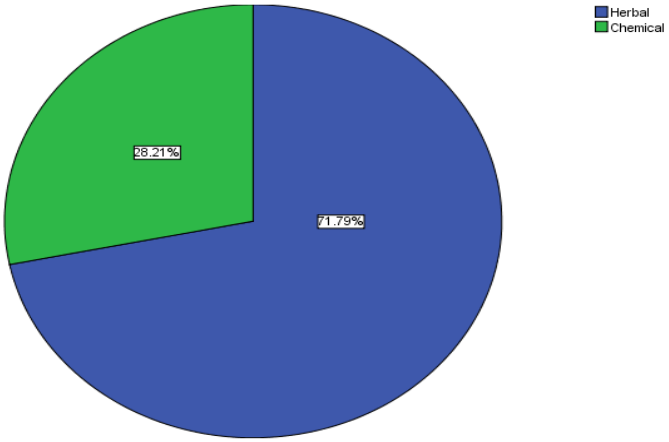

Figure 2: pie chart depicting the preference of toothpaste.71.79% prefer herbal toothpaste (blue). 29.21 % prefer chemical toothpaste (green).

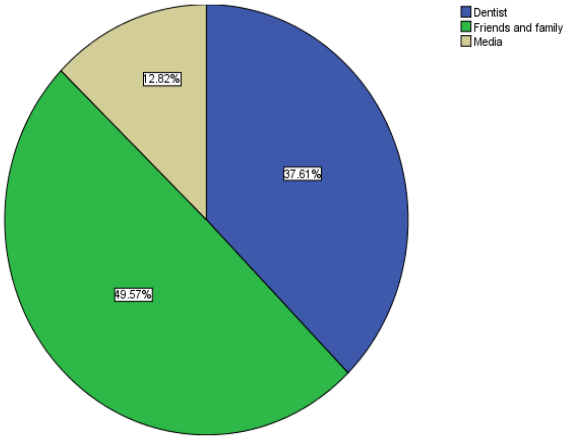

Figure 3: Pie chart depicting the influence on choice of toothpaste among the participants. 49.57% were influenced by friends and family(green), 37.61% by Dentists(blue) and 12.82% were influenced

by media (grey) .

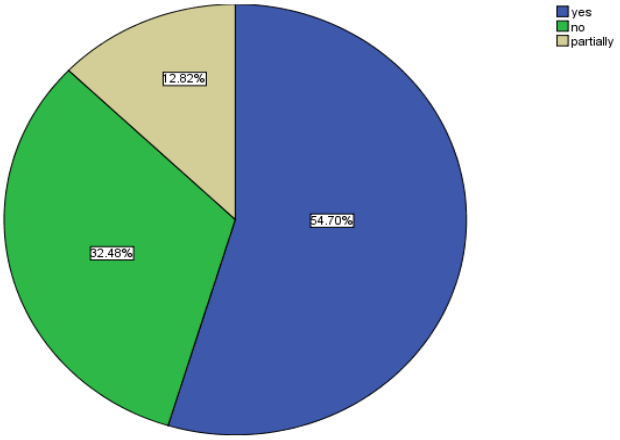

Figure 4 : Pie chart depicting the awareness of chemical toothpaste and its side effects among the participants.54.70% are aware that chemical toothpastes have side effects (blue).32.48% are unaware of it(green).12.82% have partial awareness(grey).

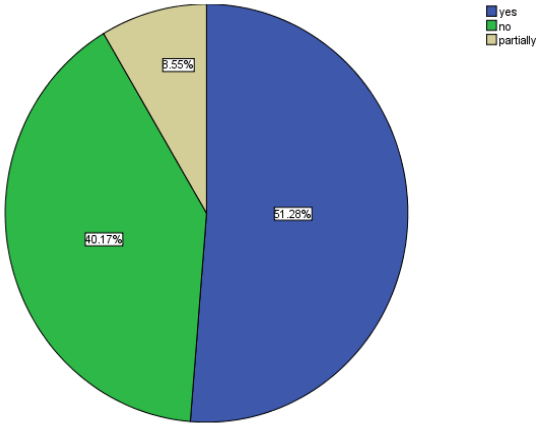

Figure 5 : Pie chart depicting the awareness of herbal toothpaste among the participants. 51.28% are aware of the herbal toothpastes (blue). 40.17% are unaware of it (green). 8.55% were partially aware of it (grey).

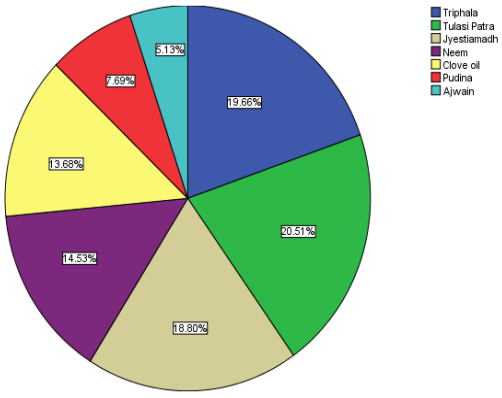

Figure 6 :Pie chart depicting the awareness of herbal contents in toothpaste among the participants. 20.51% were aware that jyestimath is used in herbal toothpaste(grey).19.66% were aware of neems

(purple),18.80% were aware of triphala(blue),14.53% were aware of tulasi patra (green),13.68% were aware of clove oil (yellow), 7.69 % were aware of pudina (red) and 5.13% were aware that ajwain is used in herbal toothpaste(sky blue).

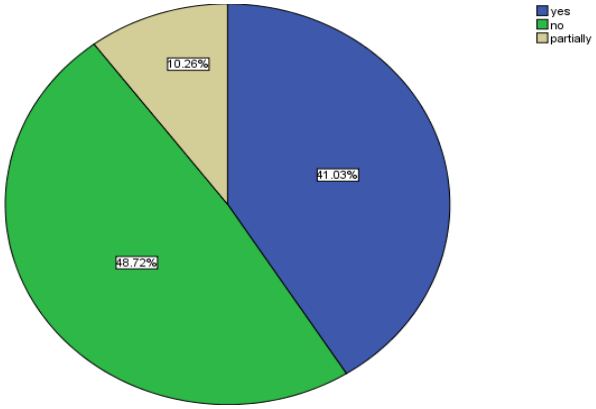

Figure 7: Pie chart depicting agreement that tooth powders are better than toothpaste.41.03% believed that tooth powders are better than toothpaste(green).48.72% disagreed with it (blue).10.26% were partially agreed to it (grey).

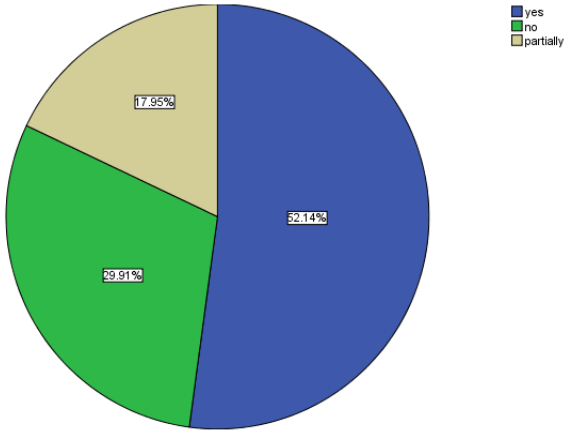

Figure 8 : Pie chart depicting the attitude towards herbal toothpaste being safer than chemical toothpaste.52.14% believed that herbal toothpaste being safer than chemical toothpaste(blue).29.91% didn't believe it(green) and 17.95% were partially believed that herbal toothpaste being safer than chemical toothpaste(grey).

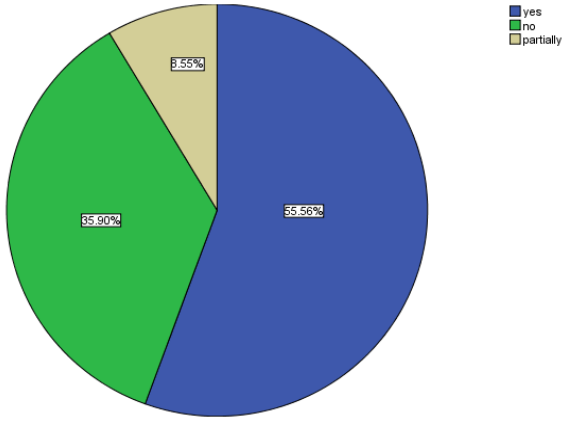

Figure 9 :Pie chart depicting the use of separate toothpaste for children. 55.56% used separate toothpaste for children(blue), 35.90%didn't use seperate toothpaste for children(green) and 8.55% partially used separate toothpaste for children(grey).

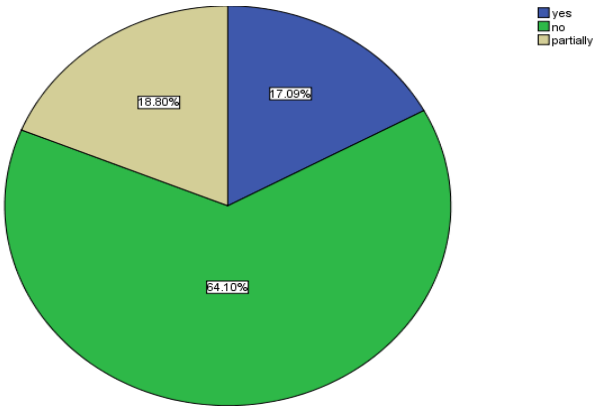

Figure 10 :Pie chart depicting the usage of fluoridated toothpaste . 64.10% did not use fluoridated toothpaste(green).17.09% used fluoridated toothpaste (blue) and 18.80% had partially used fluoridated toothpaste(grey).

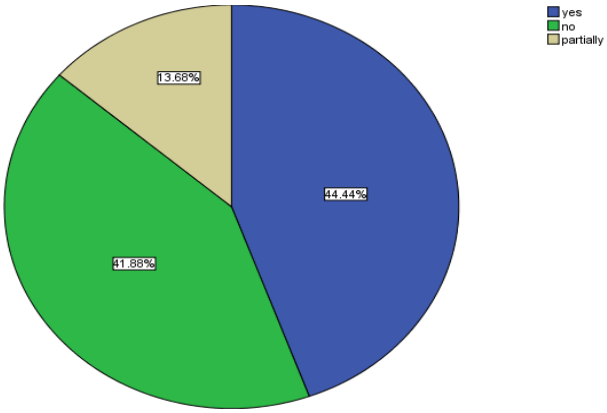

Figure 11 :Pie chart depicting the usage of desentizing toothpaste. 44.44% had used desensitizing toothpaste(blue), 41.88% had not used desensitizing toothpaste (green), 13.68% had partially used desensitizing toothpaste(grey).

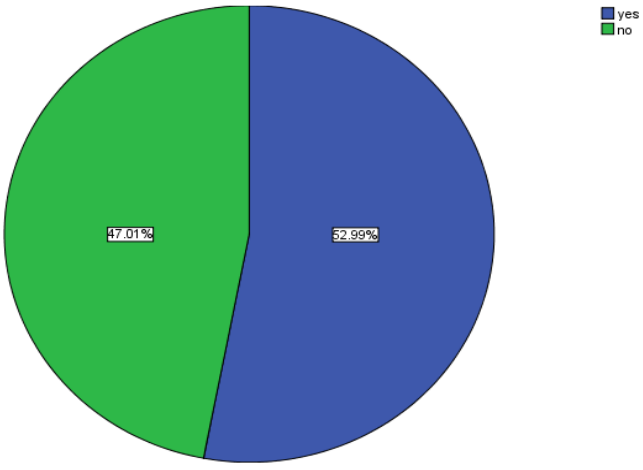

Figure 12 : Pie chart depicting the usage of whitening toothpaste. 52.99% had used whitening toothpaste(blue) and 47.01% didn't use whitening toothpaste(green).

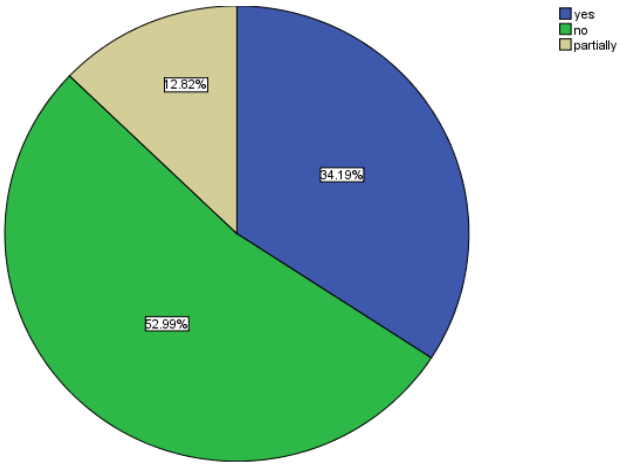

figure 13 :Pie chart depicting the response to the question,"Do you use spices to flavour the mouth and clean the teeth?". 34.19% had used spices (blue) and 52.99% haven't used spices (green), 12.82%

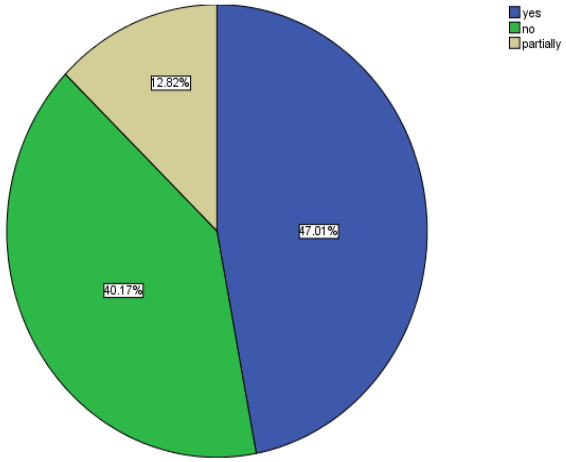

Figure 14: Pie chart depicting the practice of natural methods to clean the tooth. 47.01% practised the natural method(blue), 40.17% didn't practise natural methods(green) and 12.28% had partially used natural method(grey).

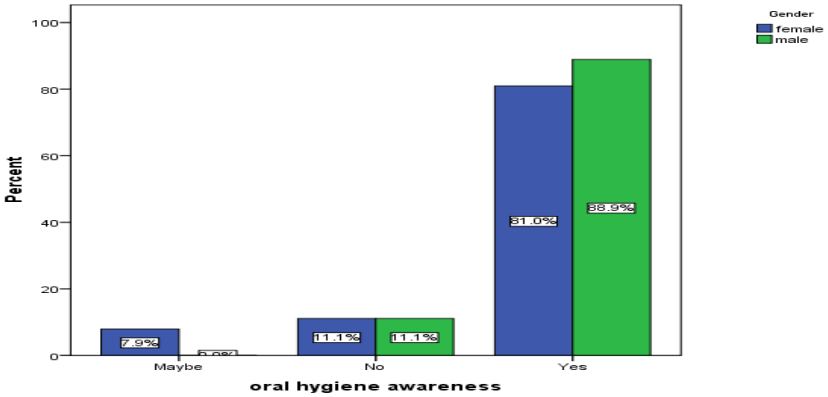

Figure 15: Bar graph showing the association of responses regarding awareness of oral hygiene with gender. X-axis represents the oral hygiene awareness and Y axis represents the percentage of responses. Blue depicts females and green depicts males. More awareness is seen among males than

the females. However, Chi square analysis (Chi square value = 4.502) did not show any statistical significance with p=0.105 (p>0.05).

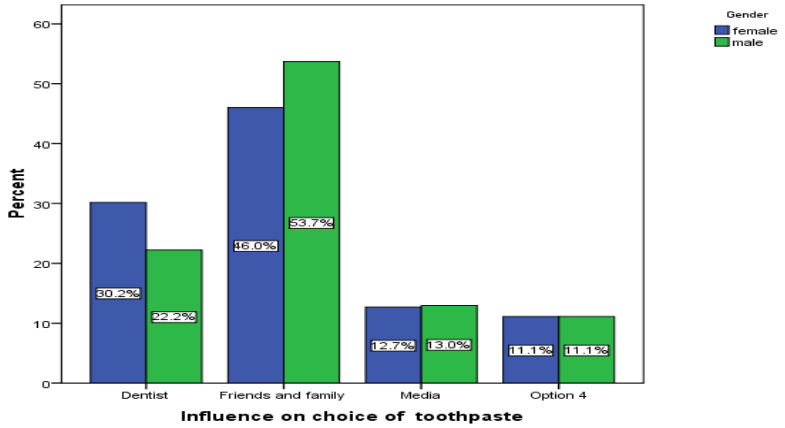

Figure 16: Bar graph showing the comparison of responses to the question "what influences you on your choice of toothpaste", with gender. X-axis represents the response regarding influence on choice of toothpaste and Y axis represents the percentage of responses. Blue depicts females and green depicts males. Maximum influence is by family and friends and males are more influenced compared to females. Chi square test (Chi square value = 1.038) did not show any statistical significance with p=0.792 (p>0.05).

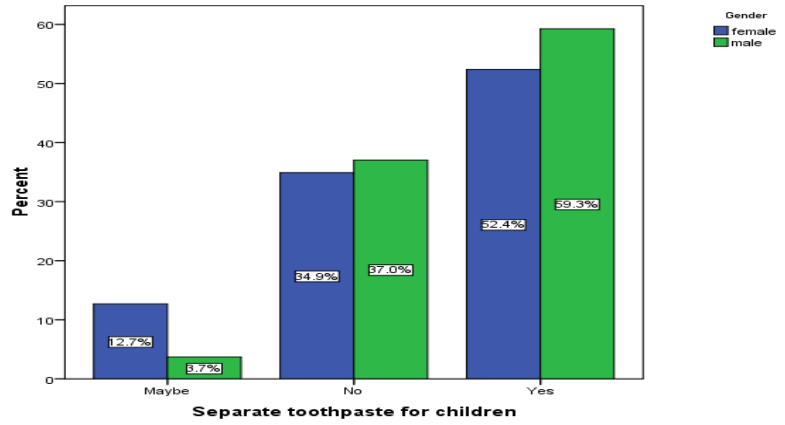

Figure 17:- Bar graph showing the association of responses to the question, "Do you use separate toothpaste for children?" with gender. X-axis represents the response for usage of separate toothpaste for children and Y-axis represents the percentage of responses. Blue depicts females and green depicts males. More awareness is seen among females than in males. Chi square analysis (Chi square value = 3.036) did not show any statistical significance with p=0.219 (p>0.05).

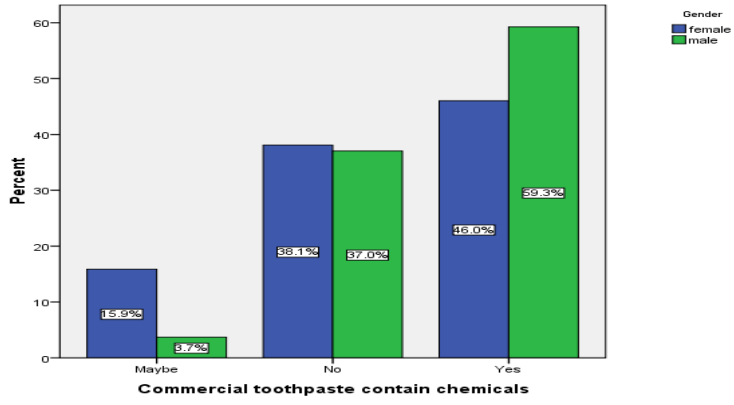

Figure 18:- Bar graph showing the association of responses to the question, “Are you aware that commercial toothpaste contains chemicals?” with gender. X-axis represents the response on the awareness of chemicals present in commercial toothpaste and Y axis represents the percentage of responses. Blue depicts females and green depicts males. More awareness regarding the presence of chemicals is seen among males than females. Chi square analysis (Chi square value =5.183) did not show any statistical significance with p=0.075 (p>0.05).

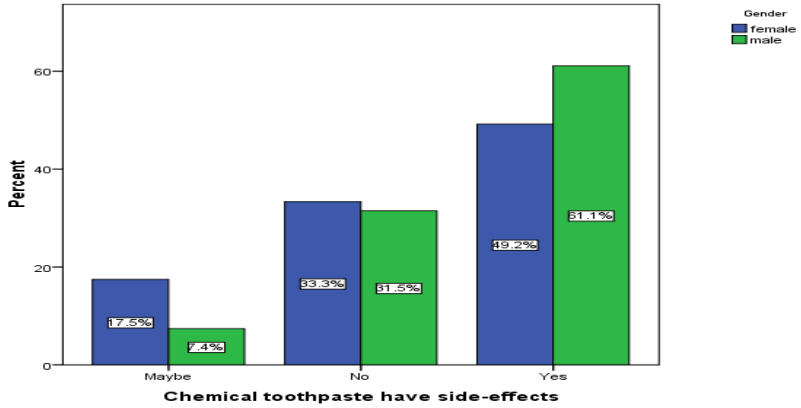

Figure 19:- Bar graph showing the association of responses to the question, “Do you think consuming chemical toothpaste can have side effects” with gender. X-axis represents the responses on the awareness of chemicals present in commercial toothpaste and Y axis represents the percentage of responses. Blue depicts females and green depicts males. More percentage of males are aware of the side effects of the chemical toothpaste than the females. Chi square analysis (Chi square value = 3.076) did not show any statistical significance with p=0.215 (p>0.05).

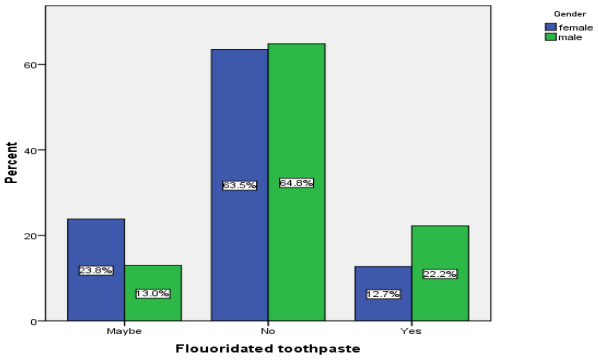

Figure 19:- Bar graph showing the association of responses to the question, “Do you use fluoridated toothpaste?” with gender. X-axis represents the responses regarding the awareness of fluoridated toothpaste and Y axis represents the percentage of responses. Blue depicts females and green depicts males. Majority of the population don't use fluoridated toothpaste.The females use fluoridated toothpaste more than the males. Chi square analysis (Chi square value = 3.370) did not show any statistical significance with p=0.185 (p>0.05).

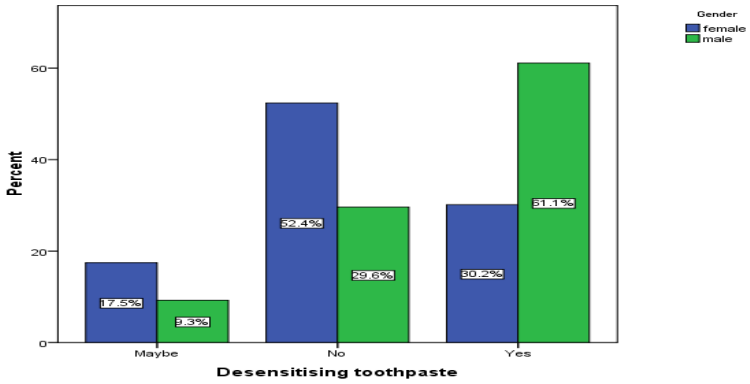

Figure 21:- Bar graph showing the association of responses to the question, "Have you used desensitizing toothpaste for sensitive teeth?" with gender. X-axis represents the responses regarding desensitising toothpaste and Y axis represents the percentage of responses. Blue depicts females and green depicts males. DEsensitizing toothpaste is used more commonly by males than females. Chi square analysis(Chi square value =11.292) shows statistical significance with p=0.004 (p<0.05). There is a significantly increased use of desensitising toothpaste among males than in females.

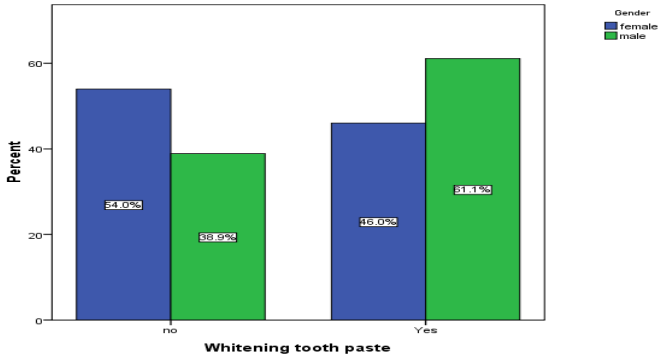

Figure 22:- Bar graph showing the association of responses to the question, "Have you used whitening toothpaste?" with gender. X-axis represents the responses on the awareness of whitening toothpaste and Y axis represents the percentage of responses. Blue depicts females and green depicts males. males used whitening toothpaste more than the females.Chi square analysis (Chi square value = 2.654) did not show any statistical significance with p=0.103(p>0.05).

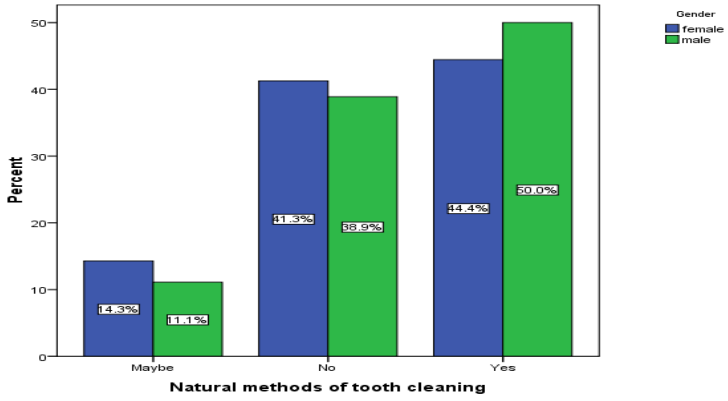

Figure 23:- Bar graph showing the association of responses to the question "Do you practice natural methods of tooth cleaning?" with gender. X-axis represents the responses yes,no and maybe and Y axis represents the percentage of responses. Blue depicts females and green depicts males. Males use natural methods of cleaning teeth more than the females. Chi square analysis (Chi square value =

0.461) did not show any statistical significance with p=0.794(p>0.05).

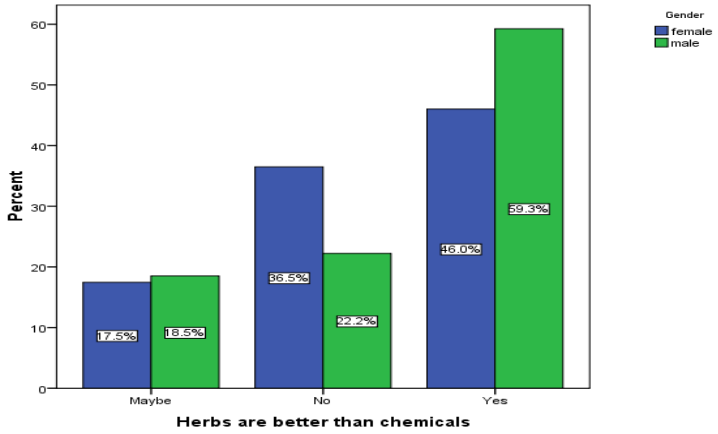

Figure 24: Bar graph showing the association of responses to the question, "Do you think older methods involving herbs are better and safer than the modern chemical tooth cleaning?" with gender. X-axis represents the responses yes and no and Y axis represents the percentage of responses. Blue depicts females and green depicts males. More males have answered that herbs are better and safer than chemicals when compared to females. However, Chi square analysis (Chi square value =2.978) did not show any statistical significance with p=0.096 (p>0.05).

Results and discussion

On assessing the knowledge level of the study participants 84.62% of the population are aware of oral hygiene. (Figure 1). 71.79% of the population prefer herbal toothpaste than a chemical toothpaste (Figure 2).Only 37.61% say that dentists influence the choice of their toothpaste, 19.57% agree with friends and family and the rest agree with the media .(Figure 3).Only 54.70% of the participants think that chemical toothpaste has side-effects. (Figure 4). 51.28% of the population are aware of herbal toothpaste(Figure 5). 20.5% of the population prefers jyeshtamadh to use in their toothpaste, whereas 19.66% prefer neem,13.69% prefer clove oil, 5.13% prefer Ajwada. 18.80% Prefer triphala and 14.53% prefer Tulasi patra (Figure 6).

47.1% of the study population practised natural tooth cleaning methods (Figure 7). 52.14% think that herbal paste is better and safer than the chemical ones (Figure 8). 55.56% of the population use separate toothpaste for the children (Figure 9).64.1% of the population uses Fluoridated Toothpaste (Figure 10).44.4% of the population have already used desensitising toothpaste for sensitive teeth (Figure 11).52.99% of the population use whitening toothpaste (Figure 12).34.19% of the population prefer spices for maintaining oral hygiene (Figure 13). 47.1% of the study population practised natural tooth cleaning methods (Figure 14).

When the responses were compared between the genders there was no statistical significance except for the use of desensitising toothpaste (Figure 15-24). There was a significantly increased use of desensitising paste among the males when compared to the females with p=0.004(Figure 21). Although the other variables did not show statistical significance, the males were found to have more awareness compared to the females.

In the survey conducted most of the participants are aware of the importance of oral hygiene, Which is in concordance with a study conducted by Isfahan, 2012, where 80.4% were aware. Oral hygiene

is the process of maintaining cleanliness of the oral cavity thereby protecting ourselves from the various oral diseases. As oral health is a reflection of systemic health, It is important to bring awareness about the importance of oral hygiene [12,30].

In the present study 65.81% of the participants agree with toothpaste to be the best aid to maintain oral hygiene which is in accordance with the study conducted by Isfahan *et al* in 2012 where 73.9% agree that toothpaste is the best aid to maintain oral hygiene. Toothpaste has several purposes, such as removing plaque from teeth, whitening teeth, reducing tooth sensitivity and freshening breath. when compared to other oral hygiene products like tooth powder and sticks, toothpaste shows more effective plaque removal [31,32]. This can be attributed to the abrasives and antimicrobial agents present in it.

In the present study 62.4% are aware that modern commercial toothpaste contains chemicals whereas in another study conducted by Isfahan *et al* only 79.6% are aware of it. In our study 67.52% agree that chemical toothpaste has side effects which is similar to the result by West *et al* in 2013 where 65% were aware of its side effects.[33] Sodium benzoate, methylparaben, and ethylparaben are common preservatives used in toothpaste and are known to cause potential side effects. Potentially harmful chemicals in toothpaste can affect your teeth and gums as well as your general health[12][13]. In the present study 64.1% use the fluoridated toothpaste whereas in a study by Tanya Walsh only 49% of the participants use fluoridated toothpastes[34,35]. Fluoride helps prevent tooth decay by slowing the breakdown of enamel and increasing the rate of the remineralization process.[34]

In the present study 55.56% of the population use separate toothpaste for the children when compared to the previous study done by maita in 2004 only 20.12% of their population use separate toothpaste for the children.Children's brands vary from 500ppmF to 1,450ppmF while adult brands vary from 1,000ppmF to 1,450ppmF. It's important for parents to buy a brand that has the right amount of fluoride for their child.[1]

In the present survey 71.79%prefers the herbal toothpaste as the best cleaning agent which is similar to the previous study where 72% agreed to the statement.Organic toothpaste does not contain dyes or artificial ingredients. They have the ability to clean your teeth gently and effectively while fighting bacteria with plant extracts, natural minerals and antiseptic essential oils. Natural and organic toothpaste refreshes the breath in the same way as conventional toothpaste[14]. Thus the survey has shown that the participants have moderate awareness about the various oral hygiene practices. It is the responsibility of dentists to instill awareness in the community in order to create an initiative to reduce the burden of oral diseases.

The limitations of the above survey is the limited collection of data and less survey sample size.
The future scope of the survey will increase the awareness and benefits of natural tooth cleaning agents and reduce the side effects of the chemical commercial toothpaste and help to maintain proper oral hygiene.

Conclusion

Based on the above survey results it can be concluded that there is average knowledge and awareness about the various chemical and herbal toothpastes among the Vijayawada population. The males were found to have more awareness than the females. The lack of proper practice of these oral hygiene measures can be restored by initiating awareness among the population inorder to reduce the burden of the various oral diseases.

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