

COMPARATIVE STUDY ON THE ATTITUDE OF GENERAL PUBLIC OF SOUTH INDIA ON USE OF TOOTHPASTE OR TOOTH POWDER FOR ORAL HYGIENE - A SURVEY

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ABSTRACT

Objective: *The state of one's mouth and dentition has a huge effect on one's life. As a result, everyone should strive for a safe mouth with a full complement of teeth. Toothbrush and toothpaste are the most regularly used oral hygiene tools. Apart from these two, people utilize other oral hygiene products either knowingly or on the recommendation of a dentist. While tooth powders are also used as a regular cleaning agent in some parts of the world, owing to their low cost. Literature on this subject is practically non-existent. As a result, it was deemed necessary to investigate the effectiveness of tooth powders in comparison to toothpastes as an oral hygiene regimen.*

Materials and Methods: *A descriptive cross sectional survey was conducted through a self administered questionnaire. The data was gathered, summarized in excel sheets, and analysed with SPSS software. The Chi square test was performed to examine the age of the participants as well as their preference for toothpaste or tooth powder in the general population of South India with statistical significance of $P < 0.05$.*

Results and Discussion: *Toothpaste was the most preferred and commonly used cleaning aid when evaluated among all the age groups. The correlation showed a p value of <0.05 which was statistically significant.*

Conclusion: *From this study it is concluded that the general population of south India prefer toothpaste over tooth powder and they are also aware of the pros and cons of both toothpaste and tooth powder.*

Keywords: *Dental Awareness, Oral hygiene, Tooth paste, Tooth powder.*

INTRODUCTION

According to the World Oral Health Report, oral disease is the fourth most expensive disease to treat, with dental treatment accounting for 5–10% of national public-health funding.^{[[1]]} The mouth is a "mirror" of one's overall health^{[[2], [3]]}. Nutritional status, cigarette smoking, alcohol, grooming, stress, and other factors are all related to a broad variety of oral diseases, forming the foundation of the traditional risk factor approach to oral disease prevention.^{[[4]]} The state of one's mouth and dentition has a huge effect on one's life. As a result, everyone should strive for a safe mouth with a full complement of teeth. Oral health awareness is regarded as a critical precondition for health-related actions^{[[5]]}. Poor knowledge of oral health results in inappropriate oral hygiene behaviors^{[[6]]}. Brushing your teeth is a useful tool for maintaining good oral hygiene.^{[[7]]} Brushing with toothpaste or tooth powder effectively eliminates dental plaque, which leads to dental caries^{[[8], [9]]}. Different styles of toothbrushes, pastes and powders, are now available on the market. The brand, amount, and quantity of toothpaste used by different people varies^{[[10]]}.

The most commonly used oral hygiene aids are a toothbrush and toothpaste. Apart from these two, there are other oral hygiene aids that people use knowingly or on the recommendation of a dentist. People's choices of oral hygiene products are affected by factors such as education, wages, media information

(advertisements), and personal preferences such as taste/flavor, color, and appearance ^{[[11]]}. Even though toothpastes are the ones we commonly use, other methods such as the wooden stick (miswak) and tooth powders, are also used as a regular cleaning agent in some parts of the world, owing to their low cost ^{[[12]]}. Tooth Powders are toothpastes that don't have a liquid humectants device. Tooth Powders have been the subject of just a few reports. As a consequence, literature on this subject is practically non-existent ^{[[13]]}. As a result, it was deemed necessary to investigate the effectiveness of tooth powders in comparison to toothpastes as an oral hygiene regimen.

Analysing and comparing the usage of toothpaste or tooth powder among the general public helps us to analyse the oral hygiene practices of the people also. Our research and knowledge have resulted in high-quality publications from our team ^{[[14-28]]} This study is to indicate which tooth cleansing aid is most commonly used among the general population. The aim of the study is to compare the attitude of the general public in south india on use of toothpaste or tooth powder for maintenance of oral hygiene.

MATERIALS AND METHODS

Study design: A cross sectional study was conducted in the month of March 2021 among 100 general public.

Study Subjects: Simple random sampling was used to select the 100 study participants. **Inclusion criteria:** All the participants who were willing to participate were included.

Ethical Considerations: Returning the completed questionnaire was considered implicit consent, and no written consent was required. The study's ethical permission is received from the Institutional Review Board (IRB) .

Study Methods: Self administered questionnaire of 14 close-ended questions was prepared and it was distributed among the general population in South India through online survey forms "GOOGLE FORMS". Demographic details were also included in the questionnaire.

Statistical Analysis: Data was analysed with SPSS version (22.0). Descriptive statistics as number and percent were calculated to summarise qualitative data. Chi square test was used to analyze and compare the data. The confidence level was 95% and of statistical significance $P < 0.05$. Finally, the result was presented by using bar charts and frequency tables.

RESULTS

Figure 1 represents the preferred aid for cleaning teeth among the adults. 71% of the participants chose toothpaste (blue) while 29% chose tooth powder (green) .

Figure 2 represents the preferred cleaning aid used by parents for their children. 57% of the participants chose toothpaste (blue) while 43% chose tooth powder (green).

Figure 3 represents the reason for preferring toothpaste over tooth powder. 13% of the participants feel its 'Used in cases of cavities' (red), 29% feel it 'Leaves your mouth and breath feeling fresh' (yellow), 7% use it as 'It contains fluoride' (purple), 21% use 'Due to different flavors' available (green) and 29% chose 'all the reasons' (blue) .1% chose it because it is 'It's easy to use' (lavender).

Figure 4 represents the disadvantages of tooth powder compared to toothpaste 8% of the participants don't use tooth powder as it 'enters into the respiratory tract' (red), 8% feel its 'Not easily usable' (purple), 25% feel 'Does not contain any flavouring agent' (green) and 59% chose 'all the reasons' (blue)

Figure 5 represents the association between the choice of the general public on use of toothpaste or tooth powder for cleaning teeth and age of the participants. Blue represents 'toothpaste' and green represents 'toothpowder'. Majority of 71% of them prefer toothpaste for cleaning their teeth, among them 52% were of the age 15 to 25 years, 8% were 26 to 35 years and 11% were of the age of 36 to 45 years. The association showed a p value of $0.00 < 0.05$ which was statistically significant.

Figure 6 represents the association between choice of the general public on use of cleansing aid for cavities and age of the participants. Majority of 46% prefer toothpaste for cavities, among them 31% were of the age 15 to 25 years, 1% were 26 to 35 years and 14% were of the age of 36 to 45 years. The association showed a p value of $0.00 < 0.05$ which was statistically significant.

Figure 7 represents the association between awareness of the general public on use of tooth powder as it is present in environmentally friendly packets and age of the participants. Majority of 74% of them prefer tooth powder as it is present in environment friendly packets, among them 31% were of the age 15 to 25 years, 22% were 26 to 35 years and 21% were of the age of 36 to 45 years. The association showed a p value of $0.00 < 0.05$ which was statistically significant.

DISCUSSION

In the present study the association between the preference of the general public of south India and their age was assessed using a questionnaire based survey, as the preference of use of different cleaning aids depend on the age of the person ^[29]. In the association between choice of general public on use of toothpaste or tooth powder for cleaning teeth and age of the participants. Majority chose toothpaste over tooth powder and showed a p value of $0.00 < 0.05$ which was statistically significant (Figure 5). Similarly toothpaste was the most preferred agent for cavities for all the age groups (Figure 6). The general public feel they use tooth powder as it is present in environmentally friendly packets (Figure 7).

The present study was done to compare the preference of the general population on use of toothpaste or tooth powder for cleaning their teeth among lesser sample sizes. Apart from this the tooth brushing techniques and the shape and size of the toothbrushes also influence oral hygiene ^{[30], [31]}. Further studies can be done on a large sample size and including the influence of other variables on a varied population in different geographic areas.

CONCLUSION

From this study it is concluded that the general population of South India prefer toothpaste over tooth powder and they are also aware of the pros and cons of both toothpastes and tooth powders. Most people prefer tooth powders because they are available in eco-friendly packets. If tooth pastes are available in the same environment friendly packets it would further increase the frequency of people using toothpastes.

Authors Contribution

Ashinie.C - Contributed to conception, design, data acquisition and interpretation, drafted and critically revised the manuscript.

Dr. Adimulapu Hima Sandeep - Contributed to conception, design, and critically revised the manuscript.

All authors gave final approval and agreed to be accountable for all aspects of the work.

Conflict of interest

The authors declare no conflict of interest.

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Table 1: Depicting the frequency and percentage of responses.

S.No	Question	Frequency	Percentage
1.	Age <ul style="list-style-type: none"> ● 15 to 25 years ● 26 to 35 years ● 36 to 45 years 	<ul style="list-style-type: none"> ● 56 ● 22 ● 22 	<ul style="list-style-type: none"> ● 56% ● 22% ● 22%
2.	Gender <ul style="list-style-type: none"> ● Male ● Female 	<ul style="list-style-type: none"> ● 13 ● 87 	<ul style="list-style-type: none"> ● 13% ● 87%
3.	Which among these would you prefer for cleaning your teeth ? <ul style="list-style-type: none"> ● Toothpaste ● Toothpowder 	<ul style="list-style-type: none"> ● 71 ● 29 	<ul style="list-style-type: none"> ● 71% ● 29%
4.	Which among these would you prefer for children? <ul style="list-style-type: none"> ● Toothpaste ● Toothpowder 	<ul style="list-style-type: none"> ● 57 ● 43 	<ul style="list-style-type: none"> ● 57% ● 43%
5.	Do you know that tooth powder should be used after diluting with water? <ul style="list-style-type: none"> ● No ● Yes 	<ul style="list-style-type: none"> ● 9 ● 91 	<ul style="list-style-type: none"> ● 9% ● 91%
6.	What type of tooth powder do you prefer for using on a daily basis ? <ul style="list-style-type: none"> ● Herbal or organic ● Synthetic 	<ul style="list-style-type: none"> ● 57 ● 43 	<ul style="list-style-type: none"> ● 57% ● 43%
7.	Why do you think people prefer toothpowder? <ul style="list-style-type: none"> ● Ability to destroy tartar ● Does not contain fluoride ● It whitens external stains ● Reduces plaque ● All of the above 	<ul style="list-style-type: none"> ● 21 ● 35 ● 6 ● 8 ● 30 	<ul style="list-style-type: none"> ● 21% ● 35% ● 6% ● 8% ● 30%
8.	Why do you think people prefer toothpaste? <ul style="list-style-type: none"> ● Due to different flavours ● Easy to use ● It contain fluoride ● leave your mouth and breath feeling fresh ● Used in cases of cavities 	<ul style="list-style-type: none"> ● 21 ● 1 ● 7 ● 29 	<ul style="list-style-type: none"> ● 21% ● 1% ● 7% ● 29%

	<ul style="list-style-type: none"> ● All of the above 	<ul style="list-style-type: none"> ● 13 ● 29 	<ul style="list-style-type: none"> ● 13% ● 29%
9.	<p>What do you think is the disadvantage of toothpaste ?</p> <ul style="list-style-type: none"> ● Hard brushing can increase risk of decay ● increase in the amount of fluoride will affect the health of teeth and bones ● It is not effective against major stains ● Reduces or scratches enamel ● All of the above 	<ul style="list-style-type: none"> ● 5 ● 21 ● 29 ● 7 ● 38 	<ul style="list-style-type: none"> ● 5% ● 21% ● 29% ● 7% ● 38%
10.	<p>What do you think is the disadvantage of tooth powder?</p> <ul style="list-style-type: none"> ● Does not contain any flavouring agents ● It has a high possibility of its entry into the respiratory tract. ● Not easily usable ● All of the above 	<ul style="list-style-type: none"> ● 25 ● 8 ● 8 ● 59 	<ul style="list-style-type: none"> ● 25% ● 8% ● 8% ● 59%
11.	<p>Which among these would you prefer for people with cavities?</p> <ul style="list-style-type: none"> ● Toothpaste ● Toothpowder ● Other 	<ul style="list-style-type: none"> ● 46 ● 12 ● 42 	<ul style="list-style-type: none"> ● 46% ● 12% ● 42%
12.	<p>Which among these do you prefer for whitening of teeth ?</p> <ul style="list-style-type: none"> ● Toothpaste ● Toothpowder 	<ul style="list-style-type: none"> ● 21 ● 79 	<ul style="list-style-type: none"> ● 21% ● 79%
13.	<p>Do you prefer toothpowder because it is present in environmentally friendly packets?</p> <ul style="list-style-type: none"> ● Maybe ● No ● Yes 	<ul style="list-style-type: none"> ● 22 ● 4 ● 74 	<ul style="list-style-type: none"> ● 22% ● 4% ● 74%

<p>14.</p>	<p>If toothpastes are present in environmentally friendly packets would you prefer toothpaste over toothpowder?</p> <ul style="list-style-type: none"> ● Maybe ● No ● Yes 	<ul style="list-style-type: none"> ● 56 ● 25 ● 19 	<ul style="list-style-type: none"> ● 56% ● 25% ● 19%
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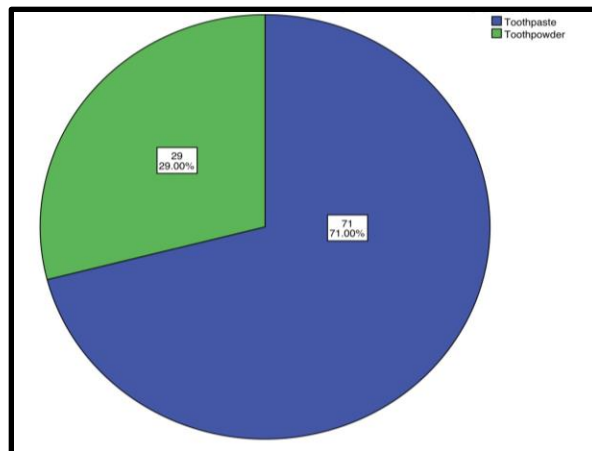


Figure 1: Pie chart depicts the choice of the general public on use of toothpaste or tooth powder for cleaning teeth. 71% of the participants chose toothpaste (blue) while 29% chose tooth powder (green) .

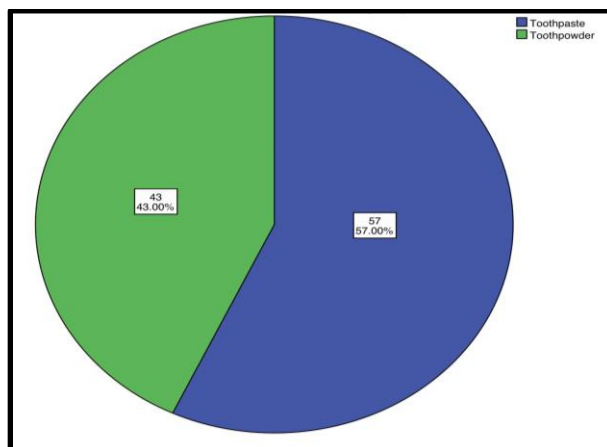


Figure 2: Pie chart depicts the preference of the general public on use of toothpaste or tooth powder for cleaning teeth in children. 57% of the participants chose toothpaste (blue) while 43% chose tooth powder (green).

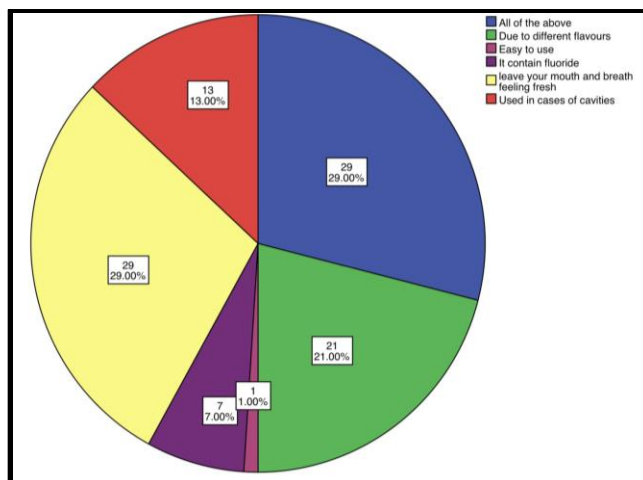


Figure 3: Pie chart depicts the reasons for preference of toothpaste among the general public. 13% of the participants chose 'Used in cases of cavities' (red), 29% chose 'Leave your mouth and breath feeling fresh' (yellow), 7% chose 'It contains fluoride' (purple), 1% chose 'Its easy to use' (lavender), 21% chose 'Due to different flavors' (green) and 29% chose 'all the reasons' (blue) .

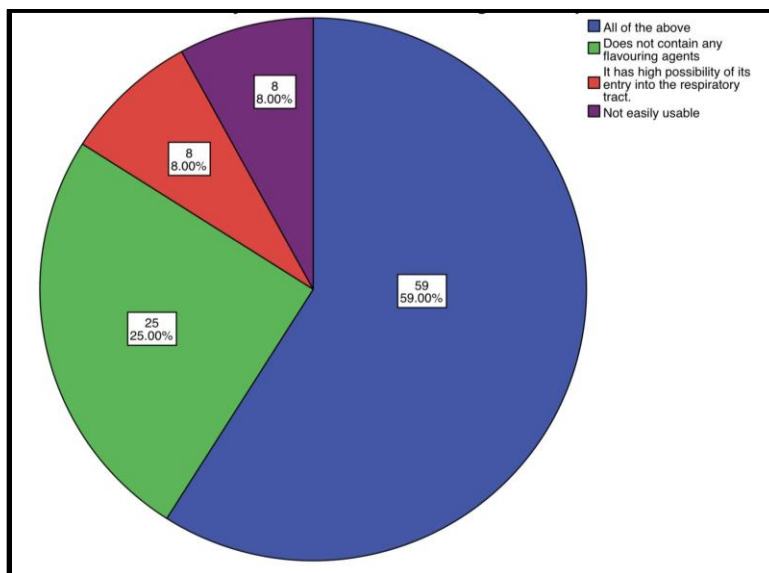


Figure 4: Pie chart depicts the knowledge of the general public on the disadvantage of toothpowder. 8% of the participants chose 'entry into the respiratory tract' (red), 8% chose 'Not easily usable' (purple), 25% chose 'Does not contain any flavouring agent' (green) and 59% chose 'all the reasons' (blue).

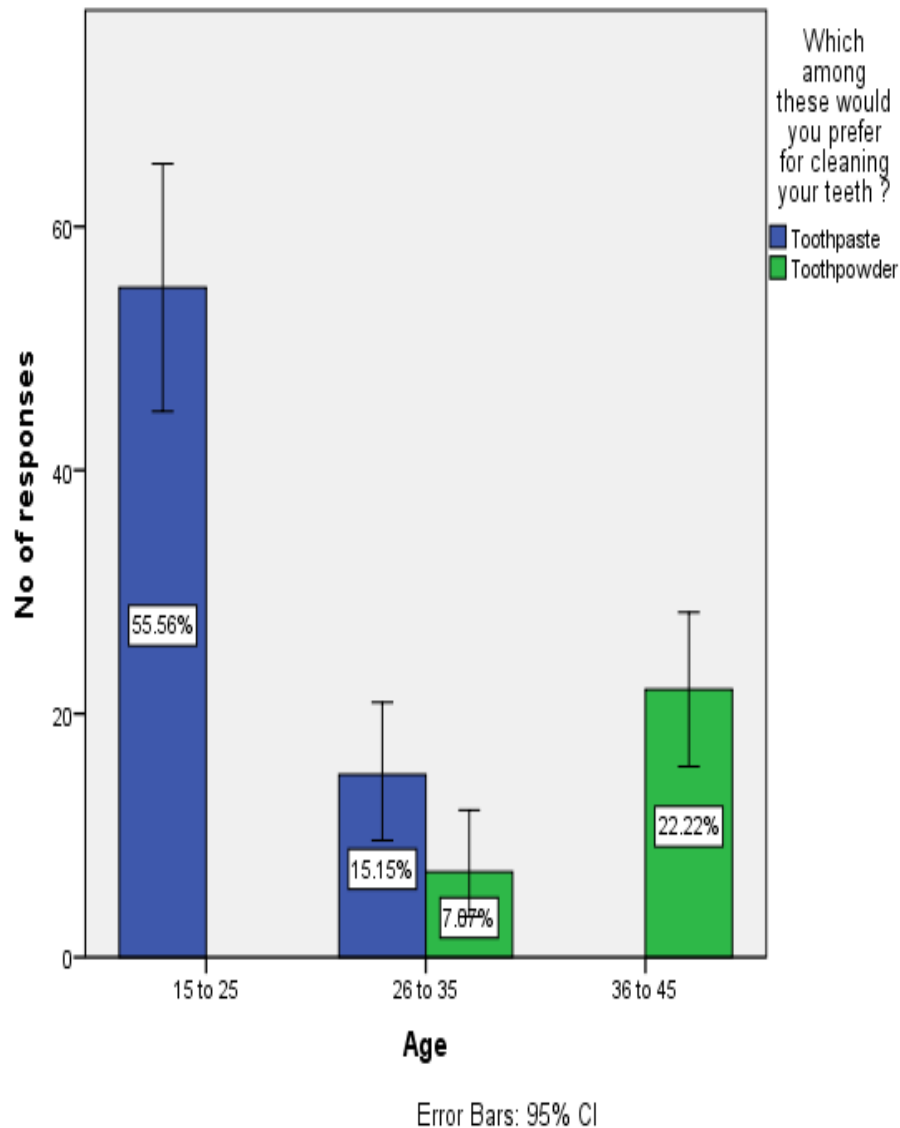


Figure 5: Bar graph representing the association between choice of general public on use of toothpaste or tooth powder for cleaning teeth and age of the participants. X axis represents the age of the participants and Y axis represents the number of respondents. Blue represents 'toothpaste' and green represents 'toothpowder'. Majority of 71% of them prefer toothpaste for cleaning their teeth, among them 52% were of the age 15 to 25 years, 8% were 26 to 35 years and 11% were of the age of 36 to 45 years. The association showed a p value of $0.00 < 0.05$ which was statistically significant.

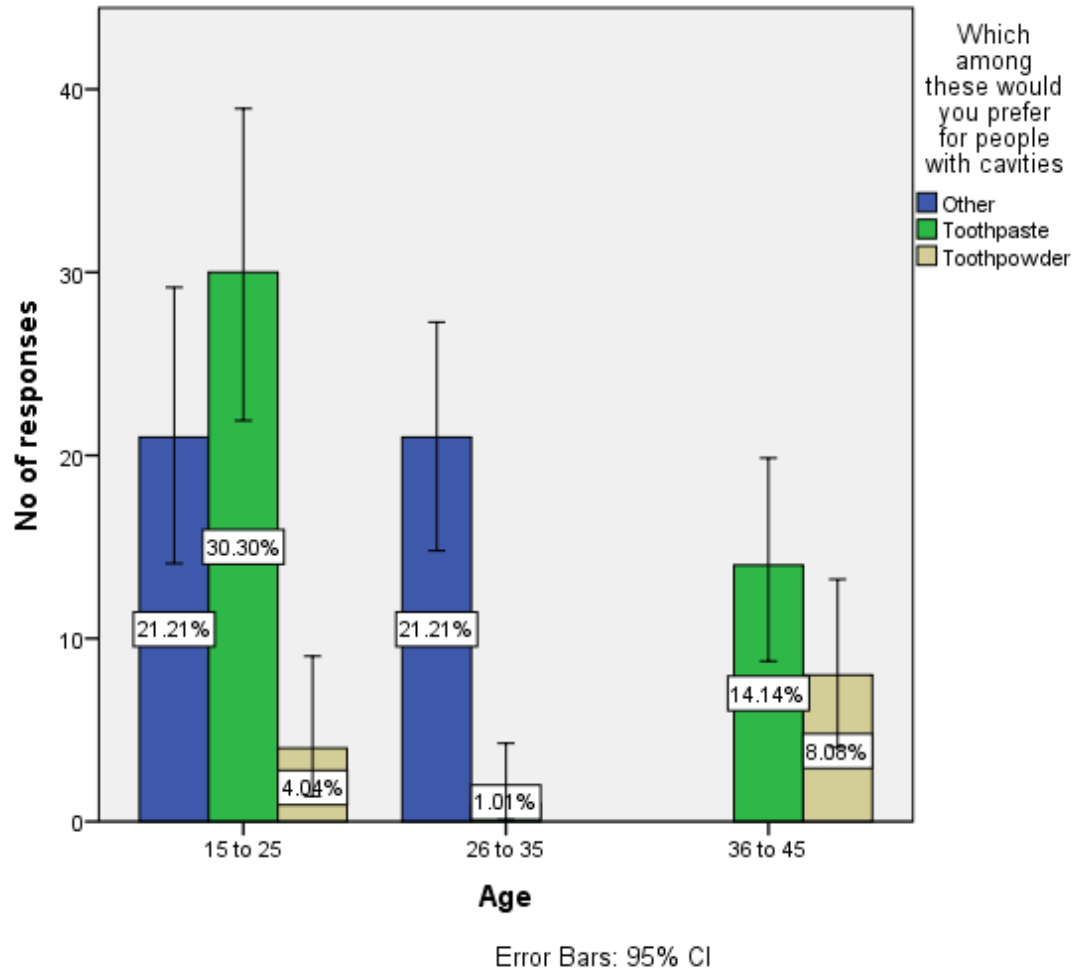


Figure 6: Bar graph representing the association between choice of general public on use of cleansing aid for cavities and age of the participants. X axis represents the age of the participants and Y axis represents the number of respondents. Green represents 'toothpaste', red represents 'toothpowder' and blue represents 'other'. Majority of 46% prefer toothpaste for patients with cavities, among them 31% were of the age 15 to 25 years, 1% were 26 to 35 years and 14% were of the age of 36 to 45 years. The association showed a p value of $0.00 < 0.05$ which was statistically significant.

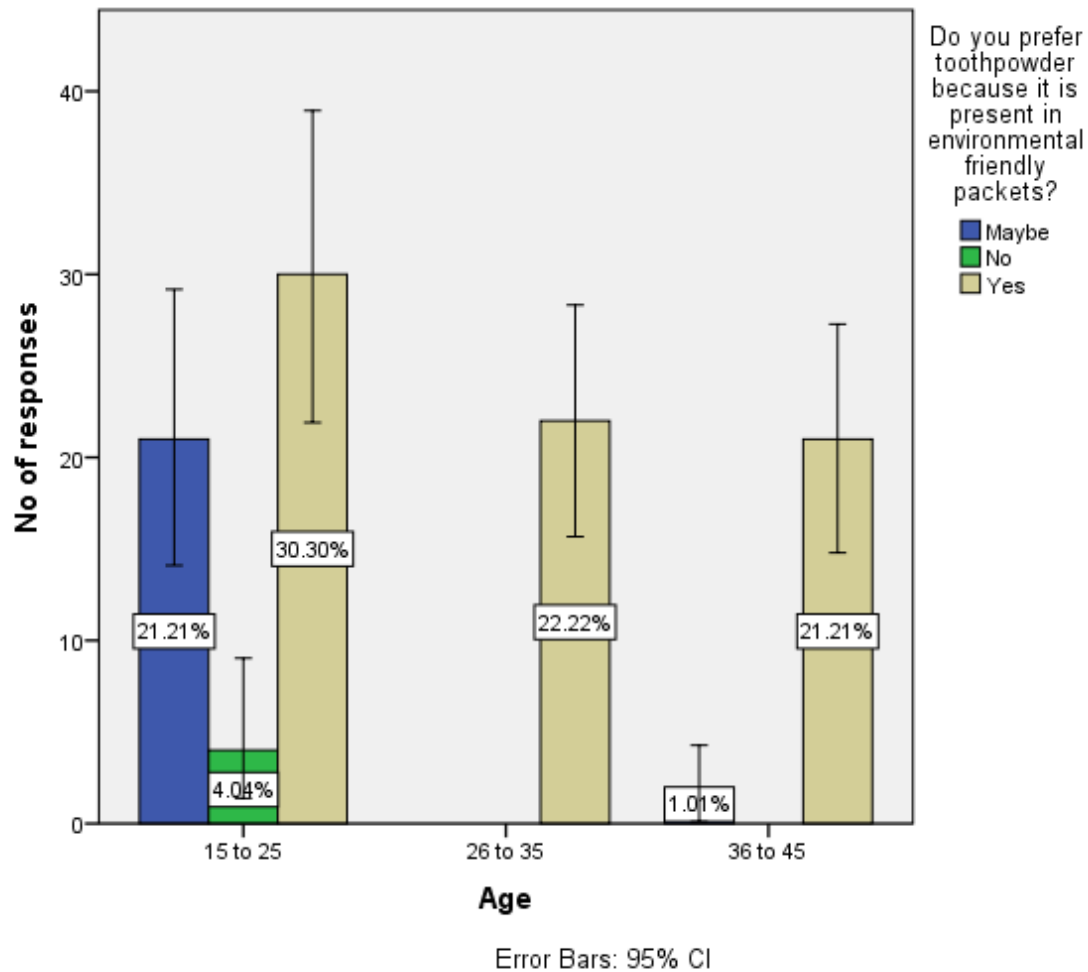


Figure 7: Bar graph representing the association between awareness of the general public on use of tooth powder as it is present in environmentally friendly packets and age of the participants. Red represents 'yes', green represents 'no' and blue represents 'maybe'. X axis represents the age of the participants and Y axis represents the number of respondents. Majority of 74% of them prefer tooth powder as it is present in environment friendly packets, among them 31% were of the age 15 to 25 years, 22% were 26 to 35 years and 21% were of the age of 36 to 45 years. The association showed a p value of $0.00 < 0.05$ which was statistically significant.