

Analytical Study to Assess People's Awareness of Toothbrush and Toothpaste Selection in Saudi Arabia

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Introduction: Toothbrush and toothpaste are the basic requirements for maintaining good oral hygiene. Daily and regular use of them can improve one's oral health and help to prevent several oral diseases such as caries and periodontal conditions. **Materials and methods:** This is a survey-based study conducted among the Saudi general public using an online questionnaire. A total of 816 Saudis participated in the survey which included questions related to their demographics, brushing habits, and knowledge about different kinds of toothbrushes and toothpaste. **Results:** The study which was carried out displayed the general statistics initially that about 69% of the total study was females whereas the rest of the 31% comprised males. Also, the majority of them who had been inquired about the survey where the ones who fell into the age group of 19 – 39 years and the rest were the ones with the age group of 40 – 59 years. **Significant differences in knowledge and attitude were observed between male and female participants. Conclusions:** Overall knowledge of participants was satisfactory. Age and educational levels were not associated with brushing habits and knowledge levels.

Keywords: Tooth brushing, Toothpaste, Dentifrices, General public, Knowledge.

INTRODUCTION

Oral health is now really being prioritized to such a level that it is likely significant as general health. Hygiene of the oral cavity is the reflection of general health. Several risk factors have been named by WHO which ultimately leads to the number of oral maladies which include alcohol consumption, tobacco smoking, stress, nutritional status, hygiene, etc. Oral health can be conserved and many of the oral maladies can be prevented if oral hygiene is kept well. To keep good care of the oral tissues, it demands the preservation of worthy oral hygiene which can be achieved by plaque control as it causes numerous gingival and dental maladies (Brothwell, 2012).

The most practiced oral cleanliness utilities are toothpaste and toothbrush. Other than these two, other utilities are either advised by the dentists or willingly used to maintain oral hygiene. Utilities that are used for oral health care are influenced by many factors which include, income, awareness through media, education, personal preferences e.g., color, appearance, and taste. The chief sources previously for oral health maintenance used to be dental literatures, mass media

and dental professionals. There is a great deal of data presented about what utilities are used for maintaining oral health but why specific merchandise is used is never highlighted (Browning, Cho & Deschepper, 2011).

Smile is one of the most important assets of a person and plays an important role in the improvement of social life. The use of toothbrush and toothpaste is of high priority when it comes to the maintenance of oral hygiene. They aid in plaque control as well as improving the esthetics of the consumer (Sarkar, Yousuf & Monzoor, 2013; Stallard, 1981).

The use of toothpaste and toothbrush is effective in combating dental caries, gum disease, malodor, calculus, erosion, and dentin hypersensitivity. Furthermore, toothpastes contain abrasives to clean and whiten teeth, flavors for breath freshening and dyes for better visual appeal. Effective toothpastes are those that are formulated for maximum bioavailability of their actives (Carranza, 2003). Attitude is a comparatively strong group of principles about a concept, object or subject which influences one to answer in a certain

avored way. People exhibit a great diversity of attitudes for dental professionals and dental care. Attitude towards oral health behavior is determined by several factors which include individual understanding, cultural insight, familial values, and other life experiences. Establishment of accurate health care services is very significant as they formulate the model of tactical development and decision forming so we should assess the existing data, activities, and attitude. Oral diseases have great occurrences and importance and so they are a great danger for public health. Articles already present relate different factors that lead to dental disease levels with fewer dental appointments, insufficient health awareness, low financial condition, cultural variations, decrease educational standards, highly cariogenic diets, and inadequate oral cleanliness.

One of the important reasons for irregular oral health aids is the absence of knowledge. People are careful about their oral hygiene due to several factors such as dental complications which are critical, dental treatment that is beneficial, and the thought of being exposed to dental maladies. Researchers have proved that there is a relation between more awareness and improved dental hygiene. If awareness is provided at individual and community levels, a great percentage of these maladies can be avoided; therefore, increasing the practices and dental knowledge amongst the individuals like regular brushing is important to disinfect gums and teeth efficiently (De Boer, Duinkerke & Arends, 1985).

AIMS OF THE STUDY

- To determine the factors associated with the selection of toothbrush and toothpaste.
- Knowledge and attitude of the public regarding the use of toothbrushes and toothpastes.
- Comparison of knowledge and attitude on the basis of gender, age, educational level, and monthly income.

MATERIALS AND METHODS

Study Design: This was a cross-sectional study conducted among the Saudi general public using an online survey.

Study Sample: Eastern region and central region based Saudis (male and female) and more than 18 years of age willing to participate in this study were requested to fill up the survey. A total of 800 citizens filled the survey using social media.

Study Instrument: An online questionnaire was designed using Google Forms with questions related to personal and demographic information followed by knowledge and practice related questions.

Statistical Analysis: Collected data were analyzed using SPSS version 22, where descriptive as well as inferential statistics were conducted. Comparisons between groups will be made with the value of significance kept under 0.05 using the Chi-square test.

RESULTS

The study which was carried out displayed the general statistics initially that about 69% of the total study was females whereas the rest of the 31% comprised of the males. Also, the majority of them who had been inquired about the survey

where the ones who fell into the age group of 19 – 39 years and the rest were the ones with the age group of 40 – 59 years. Similarly, the highest inquired people from the respective survey were the ones who were university attendants and also from the Eastern region which comprised 67% of the total. On the contrary, the highest answers were received from the ones who had significant answers and earned 9000+ SR as their earning and encompassed for 54% of the complete survey but similarly the occupation they belonged varied from 27% of them who did not work and 36% who were students and the rest being distributed among government and private jobs. The last question queried embraced the brushes which they've used and 51% answered soft and the other majority, 39% used extra soft.

When discussing on the basis of gender, the participants were inquired regarding the techniques they use to brush their teeth and the P-value recorded for their response was 0.000 which was statistically significant. Furthermore, they were questioned whether they clean their tongue while brushing, and the response was statistically significant with a P-value of 0.015. We also asked them what type of toothbrush they use for brushing their teeth and the response was statistically significant as it was in the P-value of 0.034. Lastly, they were inquired when their toothbrush should be changed and the response suggested statistically significant differences with P-value 0.000.

Participants' responses were also compared based on age groups, which revealed a statistically significant association when inquired about the type of brushing technique (p-value: 0.009), cleaning tongue habit (p-value: 0.033), type of toothpaste used (p-value: 0.008) and using toothpaste if containing fluoride (p-value: 0.000). However, the rest of the survey questions revealed no significant relationship.

We also determined the relationship between age groups and awareness of toothbrush and toothpaste. The results suggested that most of the comparisons were not statistically significant. However, significant results were seen when inquired about technique of tooth brushing (p-value: 0.009), cleaning tongue practice (p-value: 0.033), type of toothpaste used (p-value: 0.008) and choosing toothpaste if it contains fluoride (p-value: 0.000).

When the responses were compared on the basis of educational level, a significant value of 0.032 was achieved when inquired about using mouthwash and dental floss as oral hygiene aids, university graduates showed a better attitude towards it. Educational level was also associated with the decision of replacing old toothbrush when university graduates revealed their intent to do so whenever the old toothbrush bristles were frayed (p-value: 0.005). Additionally, purpose of brushing (p-value: 0.017), type of dentifrice used (p-value: 0.002) and using toothpaste when containing fluoride (p-value: 0.000) also showed a statistically significant relationship.

Discussing the income level, the P-value of 0.000 was recorded when the participants responded to the question of what type of toothpaste they used, which was statistically significant. Moreover, when asked about choosing fluoride-containing toothpaste, a statistically significant P-value 0.018 was recorded.

DISCUSSION

Health is a worldwide human necessity, and it cannot be fully achieved if we don't include oral health in it. With changing dates and passing time, humans have developed and thought about dental health and practices modernizing every day.

Table 1: Demographics of study participants

Gender:	
Male	252 (31%)
Female	550 (69%)
Age:	
19-39 Years	624(78%)
40-59 Years	167(21%)
60-79 Years	11 (1%)
Education level:	
Primary	8(1%)
Intermediate	41 (5%)
Secondary	235 (29%)
University	518 (65%)
Region:	
Central Region	267 (33%)
Eastern Region	535 (67%)
Income:	
0-3000 SR	75 (9%)
3000- 6000 SR	151 (19%)
6000- 9000 SR	145 (18%)
9000+ SR	431 (54%)
Occupation:	
Government Job	107 (13%)
Private Job	190 (24%)
Student	291 (36%)
Not Working	214 (27%)
Brush Type of:	
Extra Soft	57 (7%)
Soft	314 (39%)
Medium	411 (51%)
Hard	20 (3%)

Fig. 1: Gender Ratio

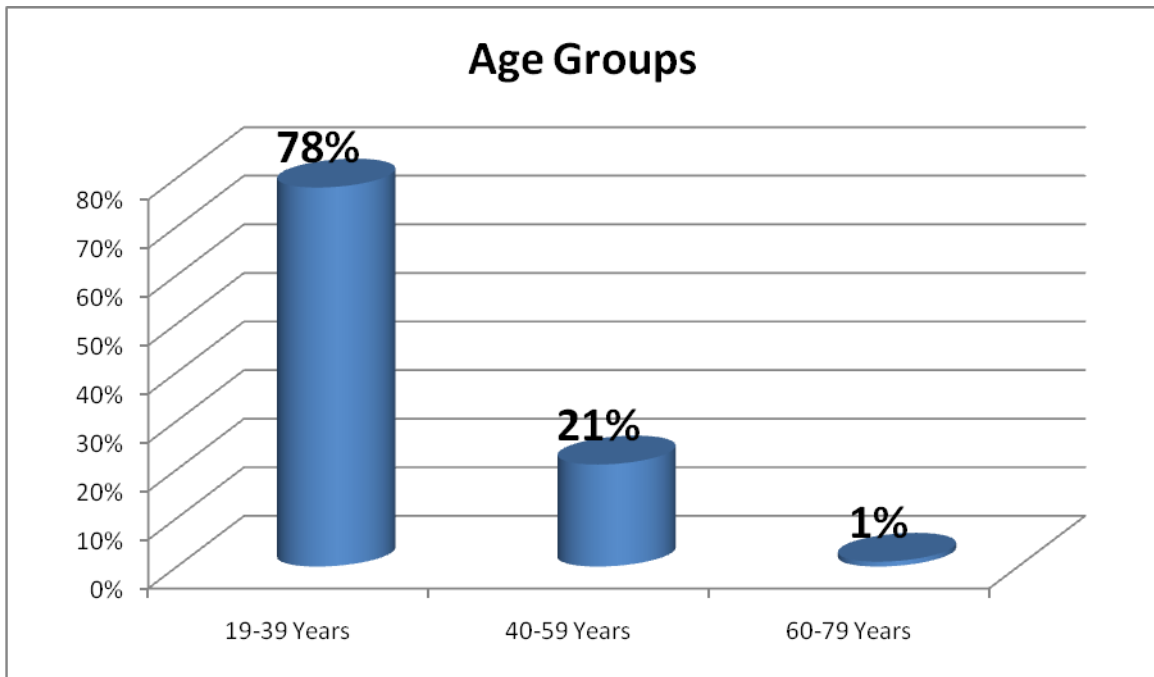


Fig. 2: Age Groups Distribution of study participants

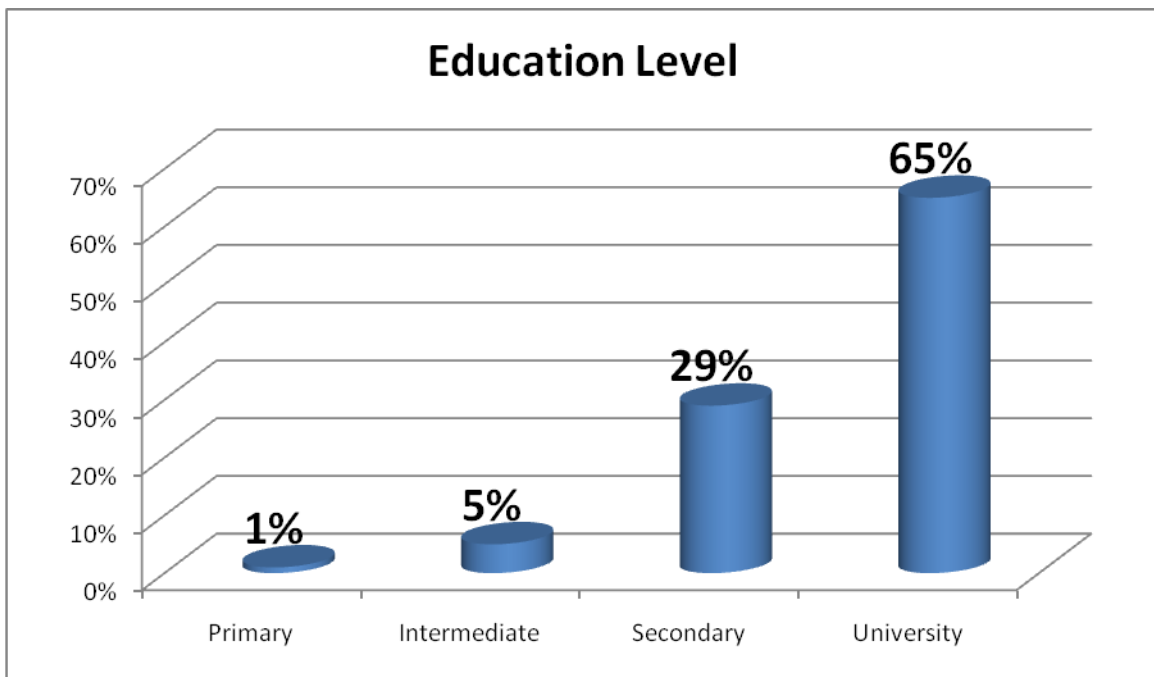


Fig. 3: Education Level distribution of Study Participants

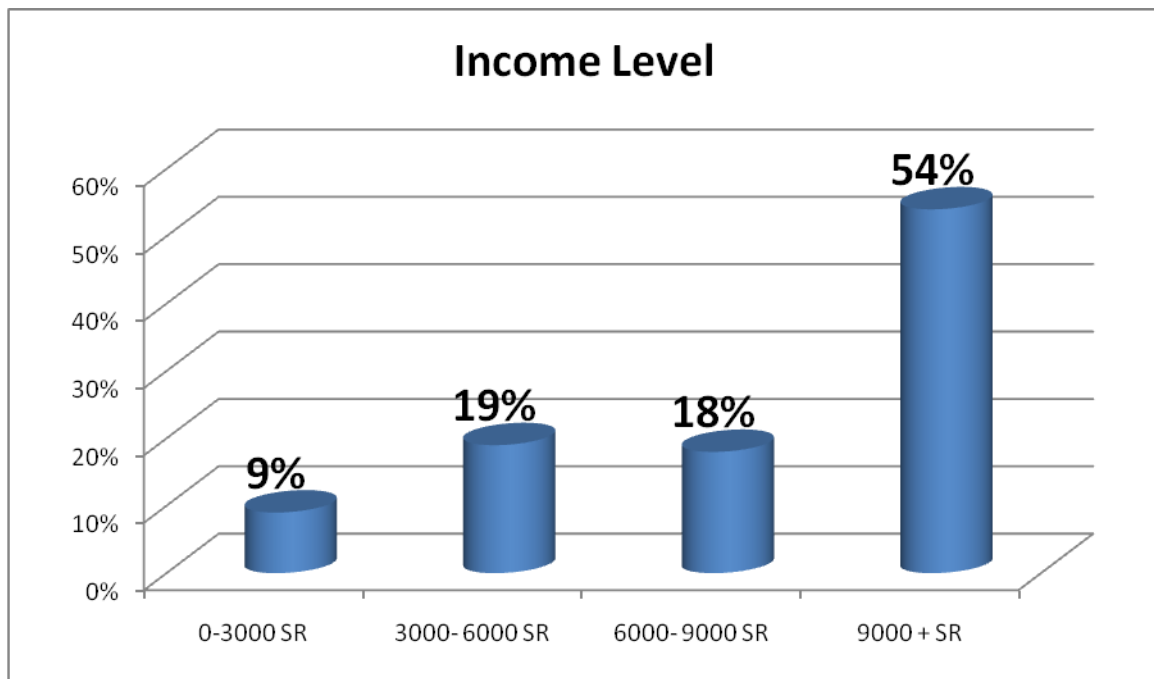


Fig. 4: Income Level distribution of Study Participants

Table 2: Comparison on the basis of Gender

Item	Male	Female	P- Value
What type of toothbrush bristles do you use?	Extra Soft 6% Soft 40% Medium 49% Hard 5%	Extra Soft 8% Soft 39% Medium 52% Hard 1%	0.034
What is the purpose of toothbrushing?	Clean Bright Teeth 22% Prevention of tooth decay and gum disease 75% Prevention of oral ulcers 2% Don't know 2%	Clean Bright Teeth 20% Prevention of tooth decay and gum disease 77% Prevention of oral ulcers 2% Don't know 1%	0.739
How many times in a day do you brush your teeth?	Once 38% Twice 53% Thrice or more 9%	Once 27% Twice 58% Thrice or more 15%	0.002
When do you brush your teeth?	In the morning 24% In the morning and before going to bed 67% In the morning, before going to bed and after eating sweet/ meals 9%	In the morning 19% In the morning and before going to bed 65% In the morning, before going to bed and after eating sweet/ meals 15%	0.020
What should be the interval for change of a toothbrush?	1-3 months 43% 4-6 months 33% 7-12 months	1-3 months 42% 4-6 months 43% 7-12 months	0.000

	5% Don't know 19%	7% Don't know 9%	
What material do you use for brushing your teeth?	Toothpaste with brush 94% Tooth power or others with finger 0% Tooth powder with brush 2% Meswak 5%	Toothpaste with brush 96% Tooth power or others with finger 1% Tooth powder with brush 1% Meswak 2%	0.068
Why would you choose to change your toothbrush?	Fraying of Bristles 90% New toothbrush deign available in market 8% After breakage of toothbrush handle 2%	Fraying of Bristles 87% New toothbrush deign available in market 11% After breakage of toothbrush handle 2%	0.445
Which technique do you use while brushing	Horizontal 36% Vertical 23% Circular 40%	Horizontal 25% Vertical 18% Circular 57%	0.000
How long do you normally take to brush your teeth?	About 30 seconds 20% About 1 minute 37% About 2 minutes 35% Don't know 8%	About 30 seconds 21% About 1 minute 41% About 2 minutes 27% Don't know 11%	0.094
Do you clean your tongue?	Yes 69%	Yes 69%	0.015
Do you use electric toothbrush?	Yes 11%	Yes 13%	0.517
Do you use any of the oral hygiene aid ?	Dental Floss 29% Mouthwash 27% No 44%	Dental Floss 37% Mouthwash 26% No 37%	0.055
Which type of toothpaste do you use?	desensitizing toothpaste 18% Fluoride toothpaste 54% Anti-decay toothpaste 14% whitening toothpaste 13%	desensitizing toothpaste 21% Fluoride toothpaste 53% Anti-decay toothpaste 11% whitening toothpaste 15%	0.402
If toothpaste does it contain fluoride?	Yes 77% No 2% Don't know 21%	Yes 70% No 3% Don't know 26%	0.163

Table 3: Comparison on the basis of Age Groups

Item	19-39 Years	40-59 Years	60-79 Years	P- Value
What type of toothbrush bristles do you use?	Extra Soft 8% Soft 41% Medium 49% Hard 2%	Extra Soft 5% Soft 33% Medium 59% Hard 2%	Extra Soft 0% Soft 27% Medium 73% Hard 0%	0.216
What is the purpose of toothbrushing?	Clean Bright Teeth 21% Prevention of tooth decay and gum disease 76% Prevention of oral ulcers 2% Don't know 1%	Clean Bright Teeth 18% Prevention of tooth decay and gum disease 76% Prevention of oral ulcers 4% Don't know 2%	Clean Bright Teeth 18% Prevention of tooth decay and gum disease 73% Prevention of oral ulcers 0% Don't know 9%	0.156
How many times in a day do you brush your teeth?	Once 30% Twice 57% Thrice or more 13%	Once 31% Twice 58% Thrice or more 11%	Once 45% Twice 27% Thrice or more 27%	0.328
When do you brush your teeth?	In the morning 21% In the morning and before going to bed 65% In the morning, before going to bed and after eating sweet/ meals 13%	In the morning 16% In the morning and before going to bed 72% In the morning, before going to bed and after eating sweet/ meals 12%	In the morning 36% In the morning and before going to bed 36% In the morning, before going to bed and after eating sweet/ meals 27%	0.116
What should be the interval for change of a toothbrush?	1-3 months 43% 4-6 months 39% 7-12 months 6% Don't know 12%	1-3 months 43% 4-6 months 39% 7-12 months 6% Don't know 12%	1-3 months 36% 4-6 months 45% 7-12 months 0% Don't know 18%	0.974
What material do you use for brushing your teeth?	Toothpaste with brush 96% Tooth power or others with finger 1% Tooth powder with brush 1% Meswak 3%	Toothpaste with brush 93% Tooth power or others with finger 0% Tooth powder with brush 2% Meswak 4%	Toothpaste with brush 100% Tooth power or others with finger 0% Tooth powder with brush 0% Meswak 0%	0.570
Why would you choose to change your toothbrush?	Fraying of Bristles 88% New toothbrush deign available in market 11% After breakage of toothbrush handle 1%	Fraying of Bristles 90% New toothbrush deign available in marke 7% After breakage of toothbrush handle 2%	Fraying of Bristles 82% New toothbrush deign available in market 9% After breakage of toothbrush handle 9%	0.130
Which technique do you use while brushing	Horizontal 29% Vertical 17% Circular 54%	Horizontal 26% Vertical 27% Circular 47%	Horizontal 27% Vertical 45% Circular 27%	0.009

How long do you normally take to brush your teeth?	About 30 seconds 21% About 1 minute 40% About 2 minutes 28% Don't know 10%	About 30 seconds 21% About 1 minute 36% About 2 minutes 34% Don't know 9%	About 30 seconds 9% About 1 minute 55% About 2 minutes 27% Don't know 9%	0.677
Do you clean your tongue?	Yes 68%	Yes 57%	Yes 64%	0.033
Do you use electric toothbrush?	Yes 13%	Yes 9%	Yes 9%	0.329
Do you use any of the oral hygiene aid ?	Dental Floss 34% Mouthwash 27% No 38%	Dental Floss 37% Mouthwash 24% No 40%	Dental Floss 9% Mouthwash 18% No 73%	0.175
Which type of toothpaste do you use?	desensitizing toothpaste 19% Fluoride toothpaste 53% Anti-decay toothpaste 12% whitening toothpaste 17%	desensitizing toothpaste 26% Fluoride toothpaste 56% Anti-decay toothpaste 11% whitening toothpaste 6%	desensitizing toothpaste 9% Fluoride toothpaste 55% Anti-decay toothpaste 27% whitening toothpaste 9%	0.008
If toothpaste does it contain fluoride?	Yes 68% No 4% Don't know 29%	Yes 89% No 1% Don't know 10%	Yes 73% No 0% Don't know 27%	0.000

Table 4: Comparison on the basis of Education Levels

Item	Primary	Intermediate	Secondary	University	P- Value
What type of toothbrush bristles do you use?	Extra Soft 13% Soft 50% Medium 38% Hard 0%	Extra Soft 0% Soft 39% Medium 61% Hard 0%	Extra Soft 8% Soft 34% Medium 55% Hard 3%	Extra Soft 7% Soft 41% Medium 49% Hard 3%	0.376
What is the purpose of toothbrushing?	Clean Bright Teeth 0% Prevention of tooth decay and gum disease 75% Prevention of oral ulcers 13% Don't know 13%	Clean Bright Teeth 15% Prevention of tooth decay and gum disease 78% Prevention of oral ulcers 5% Don't know 2%	Clean Bright Teeth 19% Prevention of tooth decay and gum disease 77% Prevention of oral ulcers 1% Don't know 3%	Clean Bright Teeth 22% Prevention of tooth decay and gum disease 75% Prevention of oral ulcers 2% Don't know 1%	0.017
How many times in a day do you brush your teeth?	Once 38% Twice 50% Thrice or more 13%	Once 22% Twice 63% Thrice or more 15%	Once 32% Twice 56% Thrice or more 12%	Once 43% Twice 57% Thrice or more 13%	0.934
When do you brush your teeth?	In the morning 50% In the morning and before going to bed 13% In the morning,	In the morning 20% In the morning and before going to bed 68% In the morning,	In the morning 23% In the morning and before going to bed 65% In the morning,	In the morning 19% In the morning and before going to bed 67% In the morning,	

	before going to bed and after eating sweet/ meals 38%	before going to bed and after eating sweet/ meals 12%	before going to bed and after eating sweet/ meals 12%	before going to bed and after eating sweet/ meals 14%	0.058
What should be the interval for change of a toothbrush?	1-3 months 38% 4-6 months 13% 7-12 months 25% Don't know 25%	1-3 months 41% 4-6 months 41% 7-12 months 5% Don't know 12%	1-3 months 37% 4-6 months 45% 7-12 months 4% Don't know 14%	1-3 months 45% 4-6 months 37% 7-12 months 7% Don't know 11%	0.054
What material do you use for brushing your teeth?	Toothpaste with brush 75% Tooth power or others with finger 0% Tooth powder with brush 13% Meswak 13%	Toothpaste with brush 88% Tooth power or others with finger 2% Tooth powder with brush 7% Meswak 2%	Toothpaste with brush 97% Tooth power or others with finger 0% Tooth powder with brush 1% Meswak 2%	Toothpaste with brush 95% Tooth power or others with finger 1% Tooth powder with brush 1% Meswak 3%	0.002
Why would you choose to change your toothbrush?	Fraying of Bristles 63% New toothbrush deign available in market 25% After breakage of toothbrush handle 13%	Fraying of Bristles 78% New toothbrush deign available in marke 15% After breakage of toothbrush handle 7%	Fraying of Bristles 89% New toothbrush deign available in market 10% After breakage of toothbrush handle 1%	Fraying of Bristles 89% New toothbrush deign available in market 10% After breakage of toothbrush handle 1%	0.005
Which technique do you use while brushing	Horizontal 38% Vertical 38% Circular 25%	Horizontal 32% Vertical 20% Circular 49%	Horizontal 29% Vertical 19% Circular 52%	Horizontal 29% Vertical 19% Circular 52%	0.806
How long do you normally take to brush your teeth?	About 30 seconds 13% About 1 minute 38% About 2 minutes 38% Don't know 13%	About 30 seconds 24% About 1 minute 29% About 2 minutes 29% Don't know 17%	About 30 seconds 22% About 1 minute 40% About 2 minutes 26% Don't know 11%	About 30 seconds 20% About 1 minute 40% About 2 minutes 31% Don't know 9%	0.676
Do you clean your tongue?	Yes 75%	Yes 66%	Yes 63%	Yes 67%	0.748
Do you use electric toothbrush?	Yes 13%	Yes 7%	Yes 10%	Yes 14%	0.350
Do you use any of the oral hygiene aid ?	Dental Floss 38% Mouthwash 13% No 50%	Dental Floss 22% Mouthwash 24% No 54%	Dental Floss 29% Mouthwash 26% No 46%	Dental Floss 38% Mouthwash 27% No 35%	0.032
Which type of toothpaste do you use?	desensitizing toothpaste 0% Fluoride toothpaste 38% Anti-decay toothpaste 38% whitening toothpaste 25%	desensitizing toothpaste 24% Fluoride toothpaste 46% Anti-decay toothpaste 20% whitening toothpaste 10%	desensitizing toothpaste 23% Fluoride toothpaste 51% Anti-decay toothpaste 11% whitening toothpaste 15%	desensitizing toothpaste 19% Fluoride toothpaste 56% Anti-decay toothpaste 11% whitening toothpaste 14%	0.172

If toothpaste does it contain fluoride?	Yes 25% No 0% Don't know 75%	Yes 49% No 2% Don't know 49%	Yes 69% No 3% Don't know 29%	Yes 77% No 3% Don't know 20%	0.000
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Table 5: Comparison on the basis of Income

Item	0-3000 SR	3000-6000 SR	6000-9000 SR	9000 + SR	P- Value
What type of toothbrush bristles do you use?	Extra Soft 7% Soft 31% Medium 60% Hard 3%	Extra Soft 8% Soft 33% Medium 56% Hard 3%	Extra Soft 6% Soft 38% Medium 54% Hard 2%	Extra Soft 7% Soft 43% Medium 47% Hard 2%	0.468
What is the purpose of toothbrushing?	Clean Bright Teeth 19% Prevention of tooth decay and gum disease 72% Prevention of oral ulcers 4% Don't know 5%	Clean Bright Teeth 19% Prevention of tooth decay and gum disease 77% Prevention of oral ulcers 2% Don't know 1%	Clean Bright Teeth 18% Prevention of tooth decay and gum disease 79% Prevention of oral ulcers 2% Don't know 1%	Clean Bright Teeth 22% Prevention of tooth decay and gum disease 75% Prevention of oral ulcers 2% Don't know 1%	0.219
How many times in a day do you brush your teeth?	Once 36% Twice 52% Thrice or more 12%	Once 34% Twice 52% Thrice or more 15%	Once 27% Twice 63% Thrice or more 10%	Once 30% Twice 57% Thrice or more 13%	0.456
When do you brush your teeth?	In the morning 28% In the morning and before going to bed 57% In the morning, before going to bed and after eating sweet/ meals 15%	In the morning 23% In the morning and before going to bed 63% In the morning, before going to bed and after eating sweet/ meals 14%	In the morning 19% In the morning and before going to bed 71% In the morning, before going to bed and after eating sweet/ meals 10%	In the morning 19% In the morning and before going to bed 67% In the morning, before going to bed and after eating sweet/ meals 14%	0.402
What should be the interval for change of a toothbrush?	1-3 months 45% 4-6 months 33% 7-12 months 7% Don't know 15%	1-3 months 40% 4-6 months 44% 7-12 months 4% Don't know 12%	1-3 months 48% 4-6 months 34% 7-12 months 11% Don't know 7%	1-3 months 41% 4-6 months 41% 7-12 months 5% Don't know 13%	0.065
What material do you use for brushing your teeth?	Toothpaste with brush 95% Tooth power or others with finger 0% Tooth powder with brush 1% Meswak 4%	Toothpaste with brush 95% Tooth power or others with finger 1% Tooth powder with brush 1% Meswak 3%	Toothpaste with brush 94% Tooth power or others with finger 1% Tooth powder with brush 1% Meswak 3%	Toothpaste with brush 96% Tooth power or others with finger 0% Tooth powder with brush 2% Meswak 2%	0.921
Why would you choose to change your toothbrush?	Fraying of Bristles 84% New toothbrush deign available in market	Fraying of Bristles 83% New toothbrush deign available in marke	Fraying of Bristles 92% New toothbrush deign available in market	Fraying of Bristles 89% New toothbrush deign available in market	0.198

	12% After breakage of toothbrush handle 4%	15% After breakage of toothbrush handle 2%	8% After breakage of toothbrush handle 1%	10% After breakage of toothbrush handle 1%	
Which technique do you use while brushing	Horizontal 35% Vertical 19% Circular 47%	Horizontal 26% Vertical 23% Circular 51%	Horizontal 27% Vertical 18% Circular 55%	Horizontal 29% Vertical 19% Circular 52%	0.802
How long do you normally take to brush your teeth?	About 30 seconds 27% About 1 minute 33% About 2 minutes 24% Don't know 16%	About 30 seconds 17% About 1 minute 40% About 2 minutes 30% Don't know 13%	About 30 seconds 21% About 1 minute 47% About 2 minutes 23% Don't know 9%	About 30 seconds 21% About 1 minute 38% About 2 minutes 32% Don't know 9%	0.147
Do you clean your tongue?	Yes 63%	Yes 66%	Yes 61%	Yes 68%	0.440
Do you use electric toothbrush?	Yes 8%	Yes 9%	Yes 11%	Yes 14%	0.209
Do you use any of the oral hygiene aid ?	Dental Floss 24% Mouthwash 27% No 49%	Dental Floss 30% Mouthwash 28% No 42%	Dental Floss 30% Mouthwash 30% No 40%	Dental Floss 39% Mouthwash 25% No 36%	0.074
Which type of toothpaste do you use?	desensitizing toothpaste 23% Fluoride toothpaste 44% Anti-decay toothpaste 24% whitening toothpaste 9%	desensitizing toothpaste 25% Fluoride toothpaste 49% Anti-decay toothpaste 15% whitening toothpaste 11%	desensitizing toothpaste 27% Fluoride toothpaste 45% Anti-decay toothpaste 10% whitening toothpaste 19%	desensitizing toothpaste 16% Fluoride toothpaste 60% Anti-decay toothpaste 10% whitening toothpaste 15%	0.000
If toothpaste does it contain fluoride?	Yes 65% No 1% Don't know 33%	Yes 68% No 5% Don't know 27%	Yes 66% No 3% Don't know 30%	Yes 77% No 2% Don't know 21%	0.018

When our findings were compared on the basis of gender, it was noted that the majority of the male subjects did not know about the proper time and replacement frequency of tooth brushing as compared to results presented by Alanazi (2017). These differences in males and females were statistically significant and 19% of the males did not know when the right time to replace their toothbrush is.

Participants showed satisfactory findings when inquired about the time of brushing, with 53% males and 58% females brushing twice a day. Such practice is essential in the maintenance of oral healthcare and patients must be educated to follow these habits (Mellette, 1976).

The selection of toothbrush in this article has been determined by the quality of the bristle than any other cause. This is the similarity between other researchers who agree on the importance of bristle strength that leads to the selection of toothbrushes. Amongst medium and soft textures, soft texture is preferred more than medium texture (Леонтьева et al., 2013). However, our study showed that the majority of the participants used medium bristled toothbrushes. This

difference was found to be statistically significant among gender only, but not significant among age groups, educational levels, and monthly income.

A study showed there were no preferences for the texture of the bristle based on gender, but our study concluded that males usually preferred hard toothbrush in comparison with females being statistically significant. The choice of male majority ended up with hard textured bristle toothbrushes as in our society may be a result of the smoking and coffee community being male-dominated. Both factors leave superficial strains and yet to get rid of them the preference is hard textured bristle toothbrushes (Parthiban et al., 2018).

About half of the participants responded that they bought toothpastes that contained fluoride, which was dissimilar to other researches. Other researchers said that this number in their researches was considerably less than this as more people tend to buy whitening toothpastes for esthetic reasons (Niwa et al, 2001).

In a similar study conducted by Anas et al (2018), nearly 82% of the people stated that they had been using tooth brushing as a source of oral hygiene. Also, nearly 7% had answered that they had been using chewing stick alone for oral hygiene. The participants were inquired about their knowledge regarding oral hygiene and how toothbrushes are supposed to be used properly. Statistically, significant comparisons were achieved among study groups with p-value <0.05.

Another investigation done by Lee, Kim & Lee (2010) revealed the oral healthcare behaviors of Korean citizens. Their findings were similar to those found in our study, with average responses from the participants when inquired about their knowledge about toothbrush. Statistically significant results were observed when these responses were compared on the basis of gender, with similar results being observed in our study.

Furthermore, another study from Korea aimed to determine the knowledge levels of the general public regarding the use of toothbrushes and toothpastes. It was noted from the findings that there was a significant relationship between education and knowledge of participants (Yum et al, 2014). Similar results were observed in our study where statistically significant differences among various educational levels were revealed with higher education levels showing better knowledge (p-value <0.05).

This study also investigated the relationship between socioeconomic status and knowledge about toothbrush. Overall, no statistically significant comparisons were achieved as all groups based on monthly income showed similar responses. However, this result was contrary to the one achieved by Almas et al (2003) where a Saudi based study revealed a significant difference. Lower socioeconomic groups showed a better level of knowledge regarding tooth brushing as compared to higher socioeconomic groups.

When tooth brushing time was inquired from the participants, it was noted that the majority of them brushed their teeth both in the morning and at night. Different findings were observed in a study conducted in India where more than half of the public reported the use of toothbrushes in the morning (Gopikrishna et al, 2016). Another study conducted in China revealed that only 5% of the old aged participants used fluoridated toothpaste, whereas majority of them did not pay attention to their oral hygiene (Zhu et al, 2011). Similar findings were noted in our study where the old aged participants showed a low level of knowledge and practice towards the use of toothbrush and fluoridated toothpaste.

CONFLICT OF INTEREST

There was no conflict of interest among the authors.

CONCLUSIONS

- Overall knowledge of study participants about the use of toothbrush is satisfactory.
- The majority of the participants are aware of the importance of fluoride in toothpaste.
- Females showed better knowledge and attitude towards the use of toothbrush and toothpaste.

- No significant difference among age groups, educational levels, and monthly income was achieved as far as their knowledge and attitude were concerned.
- The general public needs to be educated about the proper use of toothbrushes and toothpastes.

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