CAHIERS MAGELLANES-NS
Volume 06 Issue 2
2024

ISSN:1624-1940
http://magellanes.com/

KNOWLEDGE AND AWARENESS LEVEL OF ORAL HYGIENE AND ORAL HYGIENE AIDS AMONG SAUDI POPULATION

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Abstract

Background: Generally, oral hygiene plays an important role in general health and maintaining good oral hygiene may include brushing, flossing and rinsing with water or mouthwash**,** adopting good oral hygiene habits from a young age is important for lifelong dental health**,** this article discusses various aspects of oral hygiene (Periodontics), focusing on effective brushing and flossing techniques. Maintaining optimal oral health is vital for preventing dental issues such as cavities, gum disease, and halitosis (bad breath). Proper brushing and flossing not only help in removing plaque and food debris but also contribute to healthier gums and teeth. This study aims to assess knowledge and awareness of oral hygiene and oral hygiene aids among the Saudi population.
Methods: Methodology: This is an observational cross-sectional study conducted between July – November 2024 in Saudi Arabia. A sample recruiting from social media platforms (such as X, WhatsApp and Telegram). The inclusion criteria were Saudi population, males and females, ages ranging from 18 to 60, from all provinces of Saudi Arabia, Exclusion Criteria were males and females under 18 years old. The minimum target sample size is 384 was calculated using a formula based on prevalence estimation, 95% confidence level, and 5% acceptable error.
Results: The study surveyed 932 participants to evaluate knowledge and awareness of oral hygiene among the Saudi population. Findings revealed that while 58.8% of respondents brush for the recommended two minutes, a concerning 26.6% brush for less than a minute. A strong majority (77.5%) understood that regular brushing and flossing can prevent gum bleeding, though misconceptions remain, with 26.2% incorrectly believing that gum bleeding doesn't signal inflamed gums. Most participants (88.8%) recognized the importance of dental floss, and 83.3% were aware of the link between general health and dental conditions, such as gum disease and diabetes. However, toothbrush replacement practices varied, with only 48.3% replacing theirs every three months. The data also highlighted a high prevalence of tooth brushing habits (97.2%) and the use of interdental aids (71.2%), yet 28.8% did not engage in any interdental cleaning, potentially raising caries risk. Approximately 44.0% of participants

ISSN:1624-1940
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exhibited high knowledge about oral hygiene, while 32.2% had low knowledge, signaling the need for improved oral health education. Furthermore, awareness levels were significant, with 51.9% demonstrating high awareness but 34.1% showing low awareness.
Conclusion: The study revealed a concerning gap in the knowledge and awareness of oral hygiene practices among the Saudi population, with critical findings indicating that while 97.2% of participants regularly brush their teeth, only 58.8% adhere to the recommended two minutes of brushing. A staggering 26.6% brush for less than a minute, and only 48.3% regularly replace their toothbrushes every three months. Awareness of the connection between oral health and general health was high, with 83.3% acknowledging this link; however, 76% lacked knowledge about interdental aids, contributing to 28.8% not engaging in any interdental cleaning. Overall, only 44.0% of participants exhibited high knowledge of oral hygiene, underscoring the urgent need for tailored educational interventions

Keywords: Knowledge, Awareness, Oral hygiene, Oral hygiene aids, Saudi Arabia.

Introduction: Oral health is as important as general health for an individual's well-being because the oral cavity reflects the status of general health, although brushing alone eliminates up to 60% of plaque on interproximal surfaces, especially in molars and premolars, which are more likely to accumulate plaque, yet it doesn't considered an effective way of cleaning [1]. It is essential to employ extra interdental aids to achieve thorough oral hygiene, as oral biofilm is the primary cause of many diseases [1,2]. Maintaining good dental hygiene and using efficient teeth-cleaning methods are essential for fostering general oral health [3]. Dental problems including caries, periodontal disease, and malodor can be avoided by regular brushing, flossing, and usage of mouthwash [3].
The technique of maintaining a clean, healthy mouth by regular brushing and flossing to ward against periodontal disease and dental caries is known as oral hygiene. It has been demonstrated that maintaining good oral hygiene significantly helps to prevent oral diseases [4]. Brushing is still a commonly recognized and utilized component of dental hygiene [5]. In dental practice, avoiding oral illnesses is largely dependent on having an adequate understanding of and using any interdental aids effectively [5]. Studies have been published on the perception and knowledge of oral hygiene among the Saudi population, the study revealed that 18% of participants don't brush their teeth, and 60% revealed that they cleaned their teeth with a toothbrush and toothpaste. Most individuals did not report using simple methods like tongue brushing while 16% of participants did not use interdental aids [6].
Women knew more about oral hygiene practices than males did out of the 1,000 study participants who were evaluated for this study, with a significant difference (p-value < 0.05) between the two genders [7].In 2024, a research has been conducted to assess the interdental cleaning aids, 76% of patients lacked awareness about inter-dental aids [8]. This finding correlated with the fact that 77% of patients did not use any inter-dental aids, and 68% relied solely on a toothbrush for maintaining oral hygiene [8]. Existing studies indicate a lack of comprehensive awareness and knowledge about oral hygiene practices and the use of interdental aids in various populations. Still, there's limited specific data on the Saudi population. This study aimed to assess knowledge and awareness of oral hygiene and oral hygiene aids among the Saudi population**.**

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Methodology:

Study Design and Setting:
This is an observational cross-sectional study conducted between August – November 2024 in KSA. A sample recruiting from social media platforms (such as X, WhatsApp and Telegram). The study's population consisted of Saudi adults over the age of 18, participants took apart during July to November 2024 from people receiving the questionnaire.

Sample size:
Calculation of sample size was done to ensure the minimum number of respondents needed to be a representative sample for the whole population. The sample size was determined using Raosoft sample size calculator. Keeping an indicator percentage of 0.50, margin of error of 5 % and confidence interval (CI) of 95%, the calculated sample size was 384.

Inclusion and Exclusion Criteria:
The inclusion criteria were Saudi population, males and females, ages ranging from 18 to 60, from all provinces of Saudi Arabia, Exclusion Criteria were males and females under 18 years old.

Method for data collection, instrument, and score system:
Data collection was done in the form of the participant's answers to the survey questions. The questionnaire consists of four parts. Part 1, starts with a brief description of the study and the consent question. Part 2, includes demographic features such as gender, age, marital status, educational qualifications, region, occupation and income. Part 3 and 4, The participants asked about their knowledge and awareness of oral hygiene and oral hygiene aids. With the author's permission, some of the survey questions were relied upon from their questionnaire form [5].
Scoring system:
In all, 28 statements served to assess the participants' attitudes and degree of knowledge. 7 statements for demographics, 9 for knowledge, and 12 for awareness. One point is given for correct answers, and zero points are given for incorrect answers or "I don't know". For scoring, we utilized Likert scales (Dichotomous, Three-Point, and Quality Scales) The maximum score was 19 and divided as follows: The original Bloom's cut-off points, 80.0%-100.0%, 60.0%-70%, and 59.0%, The participants divided into three groups based on their scores. knowledge score varied from 0 to 9 points and was classified into three levels as follows: those with a score of 5 or below (≤ 5) were classified as having a **low level of knowledge**, those with score of 6 as having a **moderate level of knowledge**, and those with scores 7 or above (≥7) as a **high level of knowledge**.

Awareness scores varied from 0 to 10 points and were classified into three levels as follows: those with a score of 6 or below (≤ 6) were classified as having a **low level of awareness**, those with a score of 7 as having a **moderate level of awareness**, and those with scores 8 or above (≥8) as having a **high level of awareness**.

Pilot test:
The questionnaire was distributed to 384 individuals and asked to fill it out. This was done to test the simplicity of the questionnaire and the feasibility of the study. Data from the pilot study was excluded from the final data of the study.

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Analyzes and entry method: Data was entered on the computer using the "Microsoft Office Excel Software" program (2016) for Windows. Data was then transferred to the Statistical Package of Social Science Software (SPSS) program, version 25 (IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.) to be statistically analyzed.

Results:

Table (1) displays various demographic parameters of the participants with a total number of (932). Notably, the age distribution demonstrates a significant concentration of participants in the 35 to 45-year bracket, accounting for 25.1% of the cohort, while younger adults (under 23 years) represent a comparatively smaller segment at 21.7%. Gender representation leans towards females, with 55.2% compared to 44.8% males, indicating a slightly higher participation among women. The marital status data shows a predominant trend towards married individuals, comprising 53.4% of respondents, followed by a substantial number of singles at 39.7%. Regarding education, the majority hold bachelor's degrees (54.3%), reflecting a well-educated sample. Geographically, the central region is the most represented (65.7%), which may have implications for regional insights. Occupationally, the data indicates a notable percentage of students (25.1%) and unemployed individuals (16.1%), while monthly income varies, with a significant proportion earning less than 5000.

Table (1): Sociodemographic characteristics of participants (n=932)

Parameter		***No.***	***Percent (%)***
Age ***(Mean: 37.6, STD:14.6)***	less than 23 years	202	21.7
	23 to 34	216	23.2
	35 to 45	234	25.1
	46 to 55	150	16.1
	more than 55 years	130	13.9
Gender	Female	514	55.2
	Male	418	44.8
Marital status	Single	370	39.7
	Married	498	53.4
	Divorced	36	3.9
	Widowed	28	3.0
Educational level	Primary school	4	.4
	Middle school	20	2.1
	High school	190	20.4
	Diploma	72	7.7
	Bachelor's degree	506	54.3
	Postgraduate degree	140	15.0
Region of residence	Northern region	72	7.7
	Southern region	64	6.9
	Central region	612	65.7
	Eastern region	62	6.7
	Western region	122	13.1

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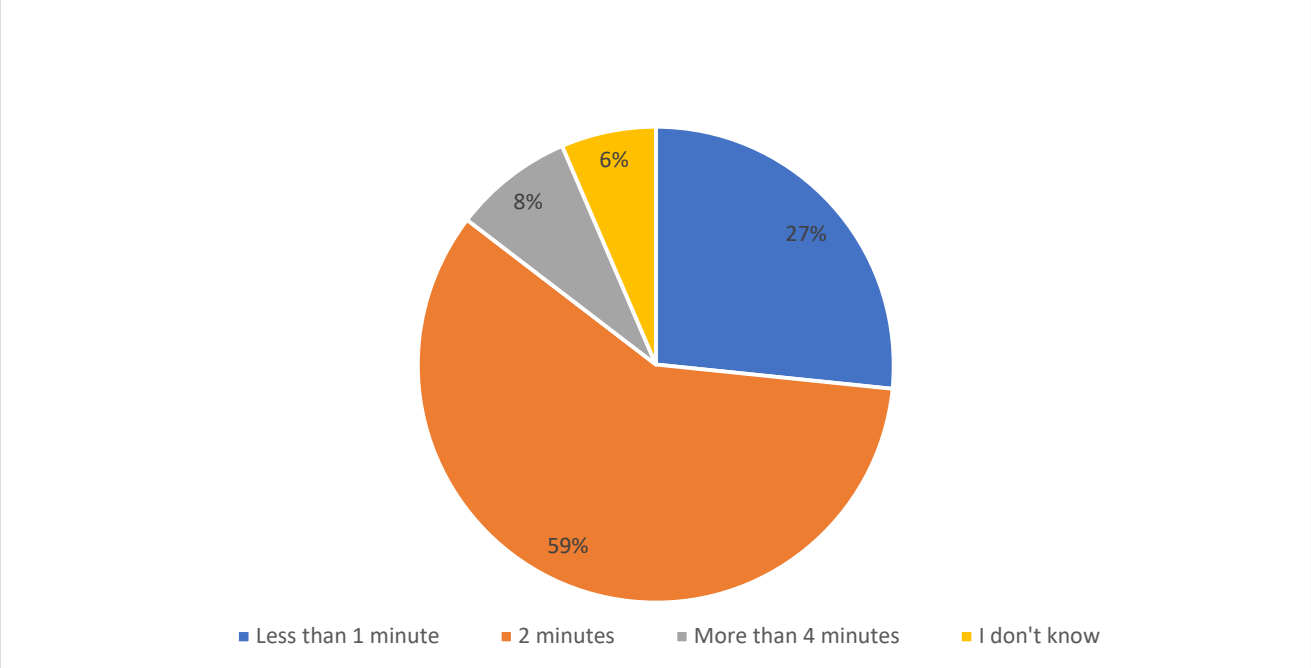
Occupational status	Health sector employee	58	6.2
	Non health sector employee	306	32.8
	Unemployed	150	16.1
	Student	234	25.1
	Retired	136	14.6
	Freelancer	48	5.2
Monthly income	Less than 5000	344	36.9
	From 5000 to 10000	190	20.4
	From 10001 to 15000	126	13.5
	More than 15000	272	29.2

As shown in figure 1, The data indicates that most respondents, 548 individuals (55%), reported brushing their teeth for 2 minutes, which aligns with the standard dental recommendation. However, a notable 248 respondents (25%) admitted to brushing for less than 1 minute, a duration considered insufficient for optimal oral hygiene. Only 76 people (8%) spent more than 4 minutes brushing, while 60 individuals (6%) were uncertain about the time they spend brushing their teeth.

Figure (1): Illustrates the time spent brushing among participants.



As illustrated in table (2), The data, derived from a sample of 932 participants, provides significant insights into public knowledge and practices related to oral hygiene. Notably, a substantial majority, 58.8%, of respondents reported spending the recommended two minutes brushing their teeth, although a concerning 26.6% indicated they brush for less than one minute. Additionally, 77.5% of participants acknowledged that regular brushing and flossing can prevent gum bleeding, suggesting a strong

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awareness of basic periodontal health. However, misconceptions persist, as 26.2% held the false belief that gum bleeding does not indicate inflamed gums. Moreover, a remarkable 88.8% recognized the necessity of dental floss for comprehensive oral hygiene, encapsulating a well-informed perception. The interconnection between general health and dental health is also evident, with 83.3% affirming their awareness of potential links, such as the relationship between gum disease and diabetes. Nonetheless, toothbrush replacement practices vary; while nearly half (48.3%) correctly replace their toothbrushes every three months, a notable portion remains uncertain or follows less frequent replacement schedules, reflecting a gap in optimal dental hygiene practices.

Table (2): Parameters related to knowledge about oral hygiene and oral hygiene aids (n=932).

Parameter		***No.***	***Percent (%)***
Time spent brushing	Less than 1 minute	248	26.6
	2 minutes	548	58.8
	More than 4 minutes	76	8.2
	I don't know	60	6.4
Gum bleeding can be avoided with regular brushing and flossing.	No	210	22.5
	Yes	722	77.5
Gum bleeding means inflamed gums	No	244	26.2
	Yes	688	73.8
Why is using dental floss necessary?	Maintaining oral hygiene	36	3.9
	Preventing gum diseases	24	2.6
	Reducing bad breath	44	4.7
	All the above	828	88.8
Do you believe that general health and dental health are related in any way? ex (Gum disease can result from diabetes)	No	156	16.7
	Yes	776	83.3
How often should you replace your toothbrush?	Once per month	112	12.0
	Once per 3 months	450	48.3
	Once per 6 months	206	22.1
	Once per year	12	1.3
	When needed	152	16.3
Kind of toothbrush:	Soft	416	44.6
	Medium	446	47.9
	Hard	22	2.4
	I don’t know	48	5.2
Oral cancer, periodontitis, and dental cavities are all influenced by diet:	Yes	604	64.8
	No	30	3.2
	I don’t know	298	32.0
Which brushing method do you use?	Horizontal	52	5.6

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	Vertical	158	17.0
	Circular	136	14.6
	Combination	580	62.2
	I dont know	6	.6

As shown in figure (2), The data reveals varying usage patterns of interdental aids. A significant portion of respondents, 350 individuals (35%), use interdental aids once a day, which reflects good oral hygiene habits. However, 144 respondents (14%) admitted to never using interdental aids, and 188 (19%) use them rarely. This suggests that a combined 33% of respondents may not be cleaning between their teeth effectively. Additionally, 126 respondents (13%) use interdental aids once a week, and 124 (12%) utilize them several times a week.

Figure (2): Illustrates rate of usage of interdental aids among participants.

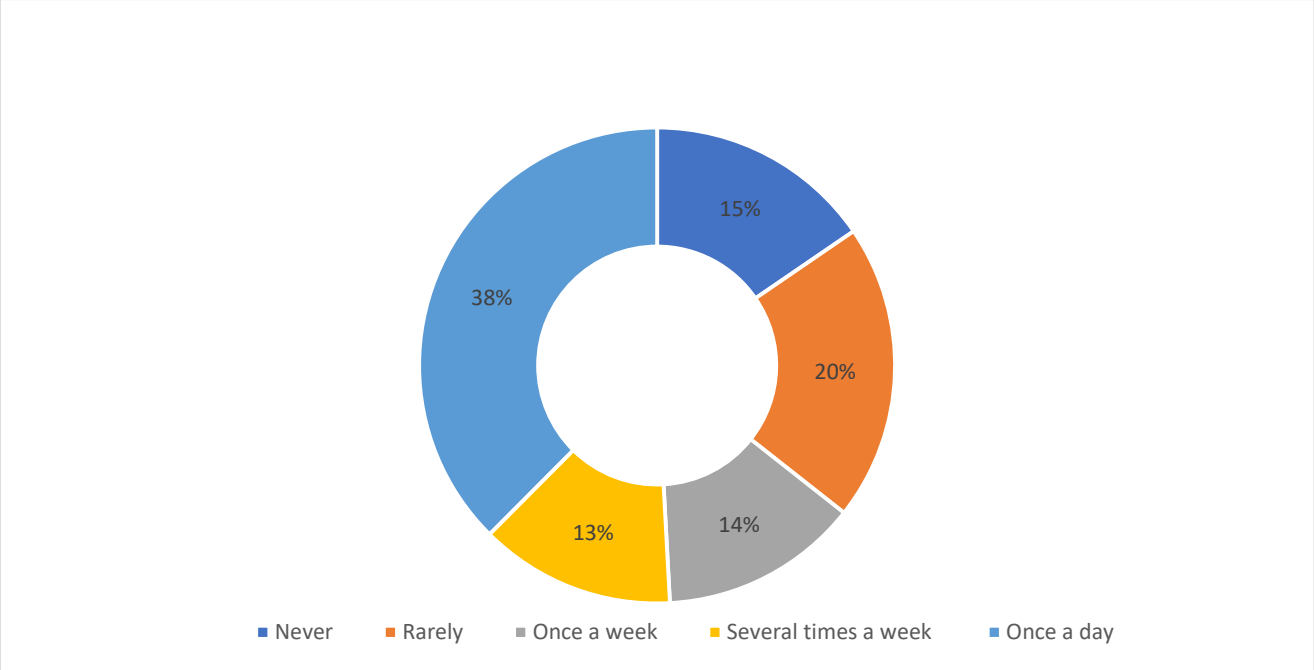

Table (3) reveals a comprehensive overview of participants' awareness and practices regarding oral hygiene, based on a substantial sample size of 932 individuals. Notably, an overwhelming majority, 97.2%, reported brushing their teeth, with a predominant preference for the conventional brush and paste method (95.1%). However, the frequency of brushing reveals significant variation; while 51.3% brush twice daily, a concerning 7.1% claim to rarely brush their teeth, indicating a potential area for public health intervention. Interdental cleaning practices are also highlighted, with 71.2% of participants utilizing some form of interdental aid—predominantly normal floss. This is encouraging, yet 28.8% do not engage in any interdental cleaning, which may increase the risk of proximal caries. The data also suggest a high level of awareness regarding the role of interdental aids in reducing caries risk, with 80.7% affirming their effectiveness.

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Table (3): participants' awareness about oral hygiene and oral hygiene aids (n=932).

Parameter		***No.***	***Percent (%)***
Do you brush your teeth?	No	26	2.8
	Yes	906	97.2
What kind of teeth-cleaning technique do you use?	Brush and Paste	886	95.1
	Brush & Powder	6	.6
	Mouthwash	6	.6
	I don't clean my teeth	8	.9
	Miswak	26	2.8
Frequency of brushing	Once a day	288	30.9
	Twice Daily	478	51.3
	Three times or more	100	10.7
	Rarely	66	7.1
What type of interdental aids do you use to clean your tongue:	With the same toothbrush	480	51.5
	Tongue scrapper	244	26.2
	I don't use any	208	22.3
Interdental aid use:	No	268	28.8
	Yes	664	71.2
How frequently do you utilize interdental aids?	Never	144	15.5
	Rarely	188	20.2
	Once a week	126	13.5
	Several times a week	124	13.3
	Once a day	350	37.6
What is the type of interdental aid used:	Normal Floss	350	37.6
	Water Floss	150	16.1
	Normal Floss with Water floss	80	8.6
	Interdental brush	38	4.1
	Interdental brush with Normal/Water floss	42	4.5
	Toothpick	118	12.7
	Any pointy object	20	2.1
	Not Applicable	134	14.4
Do you use Super Floss or an interdental brush between your prosthesis or under your bridges?	No	244	26.2
	Yes	186	20.0
	Not applicable	502	53.9
After eating, do you rinse your mouth?	No	130	13.9
	Yes	802	86.1
Self-assessment of oral health	Good	468	50.2
	Fair	412	44.2

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	Poor	52	5.6
What type of toothpaste do you use?	Fluoridated toothpaste	748	80.3
	I don't use toothpaste	8	.9
	I don't know	176	18.9
Does using interdental aids reduce the risk of proximal caries?	Yes	752	80.7
	No	16	1.7
	I don't know	164	17.6

The data presented in Table 4 elucidates the varying levels of knowledge regarding oral hygiene and the utilization of oral hygiene aids among a sample population of 932 individuals. A notable 44.0% of respondents demonstrated a high knowledge level, indicating a strong awareness of oral hygiene practices, which is encouraging as it suggests that a significant portion of the population is likely implementing effective oral care. Conversely, the presence of 32.2% of participants exhibiting low knowledge levels raises concerns about oral health education and accessibility. Furthermore, the moderate knowledge level is represented by 23.8%.

Table (4): Shows knowledge about oral hygiene and oral hygiene aids score results.

	Frequency	**Percent**
High knowledge level	410	44.0
Moderate knowledge	222	23.8
Low knowledge level	300	32.2
Total	932	100.0

The data presented in Table 5 provides a comprehensive overview of awareness levels regarding oral hygiene and the use of oral hygiene aids among a sample of 932 respondents. Notably, 51.9% of individuals demonstrated a high level of awareness, which indicates a significant portion of the population possesses a robust understanding of oral hygiene practices and their importance. Conversely, the observations reveal a concerning trend, as 34.1% exhibited low awareness, suggesting that a substantial minority may be at risk of inadequate oral care. Only 13.9% classified as having moderate awareness.

Table (5): Shows awareness about oral hygiene and oral hygiene aids score results.

	Frequency	**Percent**
High awareness level	484	51.9
Moderate awareness	130	13.9
Low awareness level	318	34.1
Total	932	100.0

Table (6) shows that knowledge level of oral hygiene has statistically significant relation to gender (P value=0.004), age (P value=0.0001), educational level (P value=0.0001), residential region (P

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value=0.0001) and monthly income (P value=0.012). It also shows statistically insignificant relation to marital status and occupational status.

Table (6): Relation between knowledge level of oral hygiene and sociodemographic characteristics.

Parameters		***Knowledge level***		***Total (N=932)***	***P value***
		High knowledge level	**Moderate or low level**		
Gender	Female	248	266	514	0.004
		60.5%	51.0%	55.2%	
	Male	162	256	418	
		39.5%	49.0%	44.8%	
Age	less than 23 years	72	130	202	0.0001
		17.6%	24.9%	21.7%	
	23 to 34	110	106	216	
		26.8%	20.3%	23.2%	
	35 to 45	110	124	234	
		26.8%	23.8%	25.1%	
	46 to 55	76	74	150	
		18.5%	14.2%	16.1%	
	more than 55 years	42	88	130	
		10.2%	16.9%	13.9%	
Marital status	Single	166	204	370	0.257
		40.5%	39.1%	39.7%	
	Married	222	276	498	
		54.1%	52.9%	53.4%	
	Divorced	10	26	36	
		2.4%	5.0%	3.9%	
	Widowed	12	16	28	
		2.9%	3.1%	3.0%	
Educational level	Primary school	0	4	4	0.0001
		0.0%	0.8%	0.4%	
	Middle school	4	16	20	
		1.0%	3.1%	2.1%	
	High school	64	126	190	
		15.6%	24.1%	20.4%	
	Diploma	22	50	72	
		5.4%	9.6%	7.7%	
	Bachelor’s degree	248	258	506	
		60.5%	49.4%	54.3%	
	Postgraduate degree	72	68	140	
		17.6%	13.0%	15.0%	
Residential region	Northern region	18	54	72	0.0001
		4.4%	10.3%	7.7%	

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	Southern region	18	46	64	
		4.4%	8.8%	6.9%	
	Central region	294	318	612	
		71.7%	60.9%	65.7%	
	Eastern region	24	38	62	
		5.9%	7.3%	6.7%	
	Western region	56	66	122	
		13.7%	12.6%	13.1%	
Occupational status	Health sector employee	26	32	58	0.491
		6.3%	6.1%	6.2%	
	Non health sector employee	136	170	306	
		33.2%	32.6%	32.8%	
	Unemployed	74	76	150	
		18.0%	14.6%	16.1%	
	Student	98	136	234	
		23.9%	26.1%	25.1%	
	Retired	60	76	136	
		14.6%	14.6%	14.6%	
	Freelancer	16	32	48	
		3.9%	6.1%	5.2%	
Monthly income	Less than 5000	150	194	344	0.012
		36.6%	37.2%	36.9%	
	From 5000 to 10000	74	116	190	
		18.0%	22.2%	20.4%	
	From 10001 to 15000	46	80	126	
		11.2%	15.3%	13.5%	
	More than 15000	140	132	272	
		34.1%	25.3%	29.2%	

P value was considered significant if ≤ 0.05.

Table (7) shows awareness level of oral hygiene has statistically significant relation to gender (P value=0.0001), age (P value=0.005), marital status (P value=0.0001), occupational status (P value=0.0001), and monthly income (P value=0.012). It also shows statistically insignificant relation to educational level, and residential region.

Table (7): Awareness level of oral hygiene in association with sociodemographic characteristics.

Parameters		***Awareness level***		***Total (N=932)***	***P value***
		High awareness level	**Moderate or low awareness**		
Gender	Female	324	190	514	0.0001
		66.9%	42.4%	55.2%	

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	Male	160	258	418	
		33.1%	57.6%	44.8%	
Age	less than 23 years	86	116	202	0.005
		17.8%	25.9%	21.7%	
	23 to 34	110	106	216	
		22.7%	23.7%	23.2%	
	35 to 45	122	112	234	
		25.2%	25.0%	25.1%	
	46 to 55	94	56	150	
		19.4%	12.5%	16.1%	
	more than 55 years	72	58	130	
		14.9%	12.9%	13.9%	
Marital status	Single	172	198	370	0.0001
		35.5%	44.2%	39.7%	
	Married	270	228	498	
		55.8%	50.9%	53.4%	
	Divorced	18	18	36	
		3.7%	4.0%	3.9%	
	Widowed	24	4	28	
		5.0%	0.9%	3.0%	
Educational level	Primary school	2	2	4	0.662
		0.4%	0.4%	0.4%	
	Middle school	8	12	20	
		1.7%	2.7%	2.1%	
	High school	94	96	190	
		19.4%	21.4%	20.4%	
	Diploma	36	36	72	
		7.4%	8.0%	7.7%	
	Bachelor’s degree	264	242	506	
		54.5%	54.0%	54.3%	
	Postgraduate degree	80	60	140	
		16.5%	13.4%	15.0%	
Residential region	Northern region	36	36	72	0.134
		7.4%	8.0%	7.7%	
	Southern region	32	32	64	
		6.6%	7.1%	6.9%	
	Central region	320	292	612	
		66.1%	65.2%	65.7%	
	Eastern region	24	38	62	
		5.0%	8.5%	6.7%	
	Western region	72	50	122	
		14.9%	11.2%	13.1%	
Occupational status	Health sector employee	38	20	58	0.0001
		7.9%	4.5%	6.2%	

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	Non health sector employee	148	158	306	
		30.6%	35.3%	32.8%	
	Unemployed	92	58	150	
		19.0%	12.9%	16.1%	
	Student	104	130	234	
		21.5%	29.0%	25.1%	
	Retired	82	54	136	
		16.9%	12.1%	14.6%	
	Freelancer	20	28	48	
		4.1%	6.3%	5.2%	
Monthly income	Less than 5000	156	188	344	0.0001
		32.2%	42.0%	36.9%	
	From 5000 to 10000	88	102	190	
		18.2%	22.8%	20.4%	
	From 10001 to 15000	84	42	126	
		17.4%	9.4%	13.5%	
	More than 15000	156	116	272	
		32.2%	25.9%	29.2%	

P value was considered significant if ≤ 0.05.

Discussion:

Oral health is increasingly acknowledged as equally significant as general health. The oral cavity serves as a "mirror" reflecting overall health [9]; however, both oral and general health conditions are influenced by a complex interaction of various factors, including individual awareness, characteristics, behaviors, and perceptions. Being aware of oral health is a crucial prerequisite for health-related behaviors, and such awareness tends to increase with age. Health-related behaviors encompass the actions individuals undertake to safeguard, promote, or maintain health while preventing diseases [10]. Oral care products are designed for purposes like cleansing the mouth, refreshing breath, and ensuring oral hygiene. As the dental industry continues to grow, a wide range of oral care products is now available, complicating the selection process. Various factors can influence the choice of oral care products, which are vital for enhancing oral health and preventing dental issues [11]. The most commonly used devices for oral hygiene include toothbrushes and toothpaste, while other aids may be utilized either upon a dentist's recommendation or voluntarily by individuals [12]. Selection factors include education, income, advertising influences, and personal preferences related to taste, color, and product presentation, among others. Sustaining proper oral health necessitates the implementation of specific practices, such as routine dental visits, frequency of brushing, dietary choices, sugar intake, use of dental floss, and other interproximal cleaning techniques [13]. These practices are essential for preventing decay and periodontitis. Moreover, awareness of oral health is vital for fostering positive behaviors concerning dental hygiene [14]. Thus, we aimed in this study to assess knowledge and awareness of oral hygiene and oral hygiene aids among the Saudi population.

In comparing our findings with those of previous studies, several noteworthy trends emerge regarding oral hygiene practices and knowledge among different demographics within the Saudi population. The study by Hussain et al. (2018) [15] highlighted that a significant majority (88%) of participants utilized

ISSN:1624-1940
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toothbrushes for dental hygiene, while our survey confirmed a pervasive adoption of tooth brushing at an even higher rate of 97.2%. Notably, their data indicated that daily brushing frequency varied, with 65% brushing once a day and only 27.5% brushing twice, contrasting with our findings where 58.8% brushed for the recommended duration of two minutes. Similarly, the study conducted by Almulhim (2016) [16] reported that 82% of respondents in Riyadh used toothbrushes, with only 4% using miswak, emphasizing a strong preference for toothbrush usage in urban areas. The prevalence of combined brushing and flossing practices was notably lower in the study by Elsabagh et al. (2018) [17], where only 36% of female students reported using both brushing and flossing for oral hygiene. This is in stark contrast to our findings, where a significant majority (88.8%) recognized the importance of dental floss, although awareness does not directly correlate with frequent usage. Furthermore, their study reported that only 42.4% brushed twice daily and a mere 29% achieved the two-minute brushing duration, highlighting a potential area for improvement in oral health education among students. A regional analysis by Hammadi et al. (2020) [18] revealed a diverse use of oral hygiene aids, with 46.5% relying solely on toothbrushes, while others utilized miswak, paralleling our data that demonstrates an overall awareness of various oral hygiene aids but points towards a need for increased educational efforts regarding their efficacy. The findings from Almassri et al. (2019) [19] indicated that a majority (55%) utilized toothbrushes, with a smaller subset employing mouthwash (23%) and miswak (17%). Notably, 39% of these participants engaged in twice-daily brushing, pointing towards similar brushing frequency patterns observed in our study. Furthermore, Al-Qahtani et al. (2020) [20] highlighted that 33.1% of schoolchildren brushed daily, revealing the potential long-term implications of established oral hygiene practices from a young age. Similar trends of inadequate knowledge about oral health were observed in a study focused on pregnant women in Poland [21], where 40% lacked basic dental knowledge, drawing attention to the critical need for targeted education. Such findings resonate with our results, wherein only 44.0% of our participants exhibited high levels of oral hygiene knowledge, emphasizing a significant gap that must be addressed through comprehensive health education initiatives. Furthermore, broader African context studies [22,23] revealed that approximately 52% of respondents were aware that brushing could help prevent gum bleeding. This awareness is comparable to our finding that 77.5% recognized the relationship between regular brushing and the prevention of gum bleeding, further illustrating the need for continued educational efforts aimed at dispelling misconceptions.

Conclusion:

In conclusion, this study highlights a significant gap in knowledge and awareness regarding oral hygiene practices among the Saudi population, despite the relatively high prevalence of tooth brushing. While many participants recognized the importance of brushing and flossing, misconceptions persist, particularly regarding gum health and the necessity of interdental cleaning aids. The findings underscore the need for targeted oral health education to enhance the understanding and application of effective hygiene practices. Increasing public awareness of the various oral care products and their proper usage can play a crucial role in preventing dental diseases and promoting overall health. Therefore, the implementation of comprehensive educational programs aimed at both children and adults is crucial to improve oral health outcomes across the population.

Acknowledgement:

Special thanks to volunteers who provided samples for this research.

Ethical approval

An informed consent was obtained from each participant after explaining the study in full and clarifying that participation is voluntary. Data collected were securely saved and used for research purposes only.

Funding

There was no external funding for this study.

Conflict of interests

The authors declare no conflict of interest.

Informed consent:

Written informed consent was acquired from each individual study participant.

Data and materials availability

All data associated with this study are present in the paper.

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