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RESEARCH ARTICLE

ASSESSMENT OF ORAL HYGIENE HABITS AND KNOWLEDGE OF CARIES AMONG UNIVERSITY STUDENTS IN TAIF CITY.

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Abstract

Background: Obtaining a baseline information of the oral hygiene habits and knowledge of caries is essential and it will help in establishment of adequate preventive programs and proper allocation of available dental services. Therefore, the aim of the present study was to examine self-reported oral hygiene habits and caries knowledge of Saudi students in Taif University.

Methods: A cross-sectional study was conducted in Taif University. A self-reported, anonymous and structured questionnaire was distributed to a random sample of 600 students (n=600; Male (M) =300, Female (F) =300) from different colleges. The questionnaire included two sections, one section for assessing the oral hygiene behavior (Q1-Q11) and another to assess the knowledge of caries (Q12-Q20). The students were requested to remain in the classroom after the lecture to answer the questions. The participation was voluntary and the answers were anonymous. The data was collected and then analyzed using Statistical Package for Social Sciences (SPSS, v.21) software to calculate the frequency distribution and percentage.

Results: The male and female responses are presented in tables to show the distribution frequency of each question. In addition, the overall percentages of total students' responses are presented in figures. Results of the first part of the questionnaire show that 47.5% (41.21% of males, 53.94% of females) practice good oral hygiene behavior. Conversely, 52.5% of students (58.79% of males and 46.06% of females) practice incorrect behavior. The results of the second part show that 45.04% of the students (47.11% of males, 42.96% of females) have correct knowledge about caries. In contrast, 54.96% of students (52.89% of males, 57.04% of females) lack that knowledge about caries.

Conclusion:

The findings of this study indicate that more than half of the students practice incorrect oral hygiene behaviors and lack the basic knowledge about caries and its related information, so this direct us to the importance of conducting oral health promotion programs to raise the

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awareness and motivate students to practice the ideal and correct oral hygiene behavior for the prevention from oral diseases.

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Introduction:-

Oral health is an important component of general health and overall quality of life ^[1]. The two most common oral diseases; caries and periodontal disease, continue to be highly prevalent in most regions of the world ^[2]. Behavior plays a major role in the prevention of both diseases in adequate oral hygiene habits and compliance with regular preventive dental visits essential for their control ^[3]. Self-preventive measures for the removal of bacterial dental plaque through adequate use of the toothbrush and dental floss have been demonstrated to reduce the prevalence of caries ^[4, 5] and periodontal diseases ^[6, 7]. Similarly, compliance with regular preventive dental examination and prophylaxis visits have been documented as essential for the prevention and early diagnosis of oral diseases ^[8-9]. Self-preventive oral health behavior and oral hygiene habits are influenced by several factors including patient motivation, attitude, and value system ^[10-11]. Consequently, differences in oral hygiene habits have been shown to be related to culture and geographic region ^[12-13]. For instance, while 73–83% of school children in Norway, Germany, Sweden, Denmark, and Austria brushed their teeth twice daily ^[12], such tooth brushing frequency was reported by only 19–46% of patients in Lithuania, Saudi Arabia (Riyadh), and Japan ^[13-14].

Until today, limited information is available on the oral hygiene habits of Saudi adults, so obtaining a baseline information of the oral hygiene habits and knowledge of caries is essential and it will help in establishment of adequate preventive programs and proper allocation of available dental services. Therefore, the aim of this study was to examine self-reported oral hygiene habits and caries knowledge of Saudi students in Taif University.

Materials and Methods:-

A cross sectional study was conducted in Taif University. A self-reported, anonymous and structured questionnaire was distributed to a random sample of 600 students (300 males and 300 females) from different colleges. The students were requested to remain in the classroom after the lecture to answer the questions. The participation was voluntary and the answers were anonymous. The study protocol was approved by the review committee of the Faculty of Dentistry in Taif University. The questionnaire used in this study covered two aspects as follow:

The first part of the questionnaire (Q1-Q11) covered oral hygiene behavior: (Tooth brushing frequency, time spent for brushing, replacement of toothbrush, cleaning of tongue, use of dental floss, use of mouthwash, purpose of visiting dentist, frequency of eating candies, frequency of having soft drinks, frequency of smoking, use of sugar with tea and coffee).

The second part (Q12 – Q20) covered oral health knowledge: (Role of sugar bacteria, saliva, soft drinks and fresh juices in getting decay, role of fluoride in toothpastes, importance of preserving the teeth from extraction, ability of teeth to regenerate, role of milk bottles to develop decay in children).

The data were collected and then analyzed using Statistical Package for Social Sciences (SPSS, v.21) software to calculate the frequency distribution and percentage.

Results:-

The questionnaire included two sections, one section for assessing the oral hygiene behavior and another to assess the knowledge of caries. The self-reported oral hygiene behavior of male and female are presented in table (1). In addition, the overall percentages of total students' responses are presented in figure (1):

Q1: 53.3% of males (n=160) and 15% of females (n=45) brush their teeth once a day, 28.7% of males (n=86) and 60% of females (n=180) brush their teeth twice a day, 10% of males (n=32) and 23.3% of females (n=70) brush more than two times a day and 7.3% of males (n=22) and 1.7% of females (n=5) never brush their teeth.

Q2: 43.3% of males (n=130) and 23.3% of females (n=70) spend only around 30 seconds for brushing, 51.3% of males (n=154) and 65% of females (n=195) spend 2-3 minutes for brushing, 5.3% of males (n=16) and 11.7% of females (n=35) spend more than 3 minutes for brushing their teeth.

Q3: 20% of males (n=60) and 21.7% of females (n=65) replace their tooth brush every month , 43.3% of males (n=130) and 60% of females replace their toothbrush every 3 – 4 months , 17.3 % of males (n=52) and 15% of females (n=45) replace their toothbrush every 6-8 months and 19.3% of males (n=58) and 3.3% of females replace their toothbrush every year or never replace it .

Q4: 57.7% of males (n=170) and 58.3% of females (n=175) clean their tongue every day , 13.3% of males (n=40) and 23.3% of females (n=70) clean it once a week , 7.3% of males (n=22) and 0% of female (n=0) clean it once a month and 23% of males (n=68) and 18% of females (n=55) don't clean it .

Q5: 10% of males (n=30) and 25% of females (n=75) use the dental floss once a day , 6% of males (n=18) and 6.7% of females use it twice a day ,4% of males (n=12) and 1.7% of females (n=5) use it more than two times a day and 80% of males (n=240) and 66.7% of females (n=200) don't use the dental floss .

Q6: 16.7% of males (n=50) and 41.7% of females (n=125) use the mouthwash once a day, 11.3% of males (n=34) and 11.7% of females (n=35) use it , 2% of males (n=6)) and 0% of female (n=0) use it more than two times a day and 70% of males (n=210) and 46.7% of females (n=140) don't use it.

Q7 : 50% of males (n=150) and 41.7% of females (n=125) visits the dentist when severe pain presents , 25.3% of males (n=76) and 41.7% of females (n=125) visit the dentist when the pain start , 8.7 % of males (n=26) and 8.3 % of females (n=25) visit the dentist for periodic examination and 16% of males (n=48) and 8.3 % of females (n=25) don't visit the dentist at all .

Q8: 36.7% of males (n=110) and 53.3% of females (n=160) have candies and biscuits multiple times during the day , 33.3 % of males (n=100) and 31.7% of females (n=95) have candies and biscuits once a day , 15.3 % of males (n=46) and 6.7 % of females (n=20) have candies and biscuits once a week and 14.7 % of males (n=44) and 8.3% of females (n=25) rarely have biscuits and candies .

Q9: 36.7% of males (n=110) and 26.7 % of females (n=80) have soft drinks multiple times during the day , 28.7% of males (n=86) and 26.7% of females (n=80) have soft drinks once a day , 23.3% of males (n=70) and 26.7% (n=80) have soft drinks once a week and 11.3% of males (n=34) and 20% of females (n=60) rarely have soft drinks .

Q10: 18% of males (n=54) and 3.3% of females (n=10) smoke multiple times during the day, 1.3% of males (n=4) and 3.3% of females (n=10) smoke once a day, 0.67% of males (n=2) and 0% of female (n=0) and 80% of males (n=240) and 93.3 % of females (n=280) rarely or never smoke.

Q11: 24.7% of males (n=74) and 35% of females (n=105) use one spoon with tea or coffee , 50% of males (n=150) and 40% of females (n=12) use two spoons of sugar with tea or coffee , 20% of males (n=60) and 15% of females (n=45) use three spoons or more with tea or coffee and 5.3% of males (n=16) and 10% of females (n=30) don't use sugar with tea or coffee .

The second section of the questionnaire assessed the knowledge about caries among males and females as presented in table (2). In addition, the overall percentages of total students' responses are presented in figure (2):

Q12: 65.3% of males (n=196) and 86.7% of females (n=260) consider sugar as the main factor for decay, 15.3% of males (n=46) and 5% of females (n=15) think the opposite and 19.3% of males (n=58) and 8.3% of females (n=25) don't know if sugar is responsible or not.

Q13: 20% of males (n=60) and 31.7% of females (n=95) think that fluoride is added to toothpastes to give it a good taste, 40% of males (n=120) and 33.3% of females (n=100) know that fluoride isn't added for enhancing taste and 40% of males (n=120) and 35% of females (n=105) don't know what is the purpose of adding fluoride.

Q14: 86.7% of males (n=260) and 88.3% of females (n=265) know that bacteria has a role in developing decay and 5.3% of males (n=16) and 3.3% of females (n=10) think that bacteria has no role in developing decay and 8% of males (n=24) and 8.3% of females (n=25) don't know if bacteria is involved in the process or not.

Q15: 59.3% of males (n=178) and 41.7% of females (n=125) know that saliva has a protecting action against decay, 17.3% of males (n=52) and 13.3 % of females (n=40) think that saliva has no role against decay and 23.3% of males (n=70) and 45% of females (n=135) don't know if saliva has a protecting action or not.

Q16: 20% of males (n=60) and 41.7% of females (n=125) think that extraction of the tooth is the best way to treat it, 64% of males (n=192) and 45% of females (n=135) know that isn't right and 16% of males (n=48) and 13.3% of females (n=40) don't know if extraction is the best solution or not.

Q17: 32% of males (n=96) and 53.3% of females (n=160) think that teeth can regenerate again if care is taken, 46.7% of males (n=140) and 30% of females (n=90) know that's not true and 21.3% of males (n=64) and 16.7% of females (n=50) don't know if teeth has the ability to regenerate or not.

Q18: 46.7% of males (n=140) and 68.3% of females (n=205) think that soft drinks cause decay because they contain gases, 25.3% of males (n=76) and 16.7% of females (n=50) know that's not right and 28% of males (n=84) and 15% of females (n=45) don't know if soft drink is causing decay because of gases or not.

Q19: 22.7% of males (n=68) and 33.3% of females (n=100) know that children are at risk of developing decay from milk bottles, 43.3% of males (n=130) and 36.7% of females (n=110) think not and 34% of males (n=102) and 30% of females (n=90) don't know if milk bottles increasing the risk or not.

Q20: 14% of males (n=42) and 11.7% of females (n=35) know that fresh juices can harm our teeth, 67.3% of males (n=202) and 71.7% of females think that fresh juices will not harm our teeth and 18.7% of males (n=56) and 16.7% of females (n=50) don't know if fresh juices will harm our teeth or not.

Table 1:- Frequency distribution and percentage of students' responses regarding oral hygiene behavior

		A	B	C	D	Total
1- Times of tooth brushing a day		Once a day	Twice	>2	None	
		160	86	32	22	300
	M	53.33%	28.67%	10.67%	7.33%	100%
	F	45	180	70	5	300
		15.00%	60.00%	23.33%	1.67%	100%
2-Time spent for cleaning teeth		30 seconds	2-3 min	>3 min		
	M	130	154	16		300
		43.33%	51.33%	5.33%		100%
	F	70	195	35		300
		23.33%	65.00%	11.67%		100%
3-When do you replace your toothbrush		Every month	Every 3 - 4 months	Every 6 - 8 months	Every year / never	
	M	60	130	52	58	300
		20.00%	43.33%	17.33%	19.33%	100%
	F	65	180	45	10	300
		21.67%	60.00%	15.00%	3.33%	100%
4- Do you clean your tongue ?		Yes ,Every day	Yes, Once a week	Yes,Once a month	No	
	M	170	40	22	68	300
		56.67%	13.33%	7.33%	22.67%	100%
	F	175	70	0	55	300
		58.33%	23.33%	0.00%	18.33%	100%
5-Do you use dental floss		Yes, once a day	Yes,twice a day	Yes, more than 2 times a day	No	
	M	30	18	12	240	300
		10.00%	6.00%	4.00%	80.00%	100%
	F	75	20	5	200	300
		25.00%	6.67%	1.67%	66.67%	100%
6-Do you use a		Yes, once a day	Yes, twice a	Yes, more than	No	

mouthwash			day	2 times a day		
	M	50	34	6	210	300
		16.67%	11.33%	2.00%	70.00%	100%
	F	125	35		140	300
		41.67%	11.67%	0.00%	46.67%	100%
7- When do you visit the dentist?		When sever pain presents	When the pain starts	For periodic examination	Never	
	M	150	76	26	48	300
		50.00%	25.33%	8.67%	16.00%	100%
	F	125	125	25	25	300
		41.67%	41.67%	8.33%	8.33%	100%
8-How many times do you eat candies and biscuits?		Multiple times during a day	Once a day	Once a week	Rarely	
	M	110	100	46	44	300
		36.67%	33.33%	15.33%	14.67%	100%
	F	160	95	20	25	300
		53.33%	31.67%	6.67%	8.33%	100%
9-How many times do you have soft drinks?		Multiple times during a day	Once a day	Once a week	Rarely	
	M	110	86	70	34	300
		36.67%	28.67%	23.33%	11.33%	100%
	F	80	80	80	60	300
		26.67%	26.67%	26.67%	20.00%	100%
10-How many times do you smoke?		Multiple times during a day	Once a day	Once a week	Rarely / Never	
	M	54	4	2	240	300
		18.00%	1.33%	0.67%	80.00%	100%
	F	10	10	0	280	300
		3.33%	3.33%	0.00%	93.33%	100%
11-Number of sugar spoons with tea / coffee		One spoon	Two spoons	Three or more	Non	
	M	74	150	60	16	300
		24.67%	50.00%	20.00%	5.33%	100%
	F	105	120	45	30	300
		35.00%	40.00%	15.00%	10.00%	100%

M= Male & F= Female.

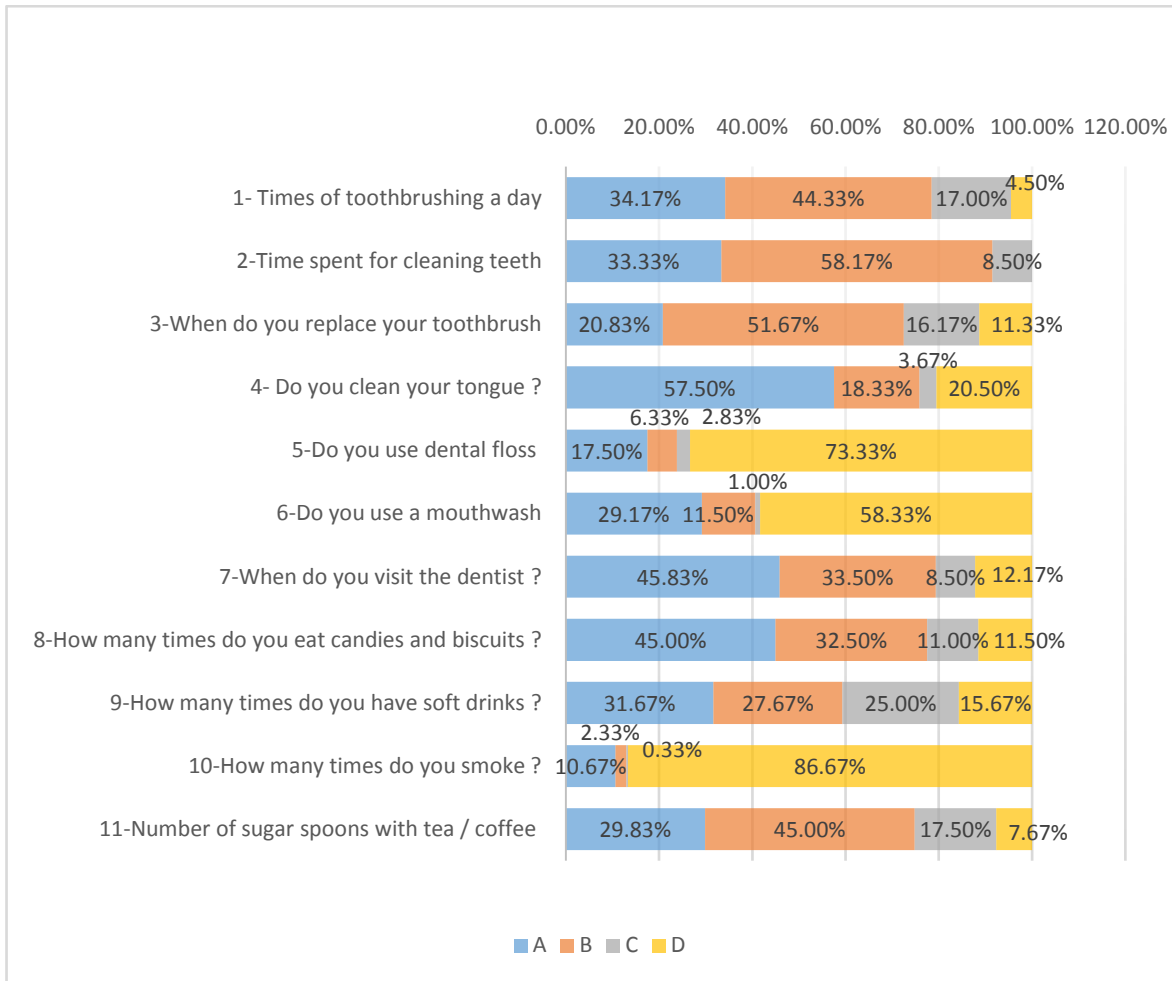


Figure 1:- Percentage of total students' responses regarding oral hygiene behavior (refer to table 1 for A,B ,C and D for each question) :

Table 2:- Frequency distribution and percentage of students' responses regarding knowledge about caries

12- Sugar is considered as the main factor for decay		Yes	No	I don't know	
		M	196 65.33%	46 15.33%	
13-Fluraide is added to the toothpaste for giving it a good taste		Yes	No	I don't know	
		M	60 20.00%	120 40.00%	
14-Bacteria has a role in decay		Yes	No	I don't know	
		F	260 86.67%	15 5.00%	
15- Saliva protect the teeth from getting decayed :		Yes	No	I don't know	
		M	95 31.67%	100 33.33%	
		Yes	No	I don't know	
		F	265 88.33%	10 3.33%	
		Yes	No	I don't know	
		M	178 59.33%	52 17.33%	

	F	125	40	135	300
		41.67%	13.33%	45.00%	100%
16-Extraction of the tooth with pain is the best way for treating it	M	Yes	No	I don't know	
		60	192	48	300
	M	20.00%	64.00%	16.00%	100%
		F	125	135	40
	F	41.67%	45.00%	13.33%	100%
		Yes	No	I don't know	
17-Teeth can regenerate if care is taken	M	96	140	64	300
		32.00%	46.67%	21.33%	100%
	F	160	90	50	300
		53.33%	30.00%	16.67%	100%
18-Soft drinks lead to decay because they contain gases	M	Yes	No	I don't know	
		140	76	84	300
	M	46.67%	25.33%	28.00%	100%
		F	205	50	45
	F	68.33%	16.67%	15.00%	100%
		Yes	No	I don't know	
19-Children are prone to decay from the milk bottles	M	68	130	102	300
		22.67%	43.33%	34.00%	100%
	F	100	110	90	300
		33.33%	36.67%	30.00%	100%
20-Fresh juices can harm the teeth and contribute in destroying them	M	Yes	No	I don't know	
		42	202	56	300
	M	14.00%	67.33%	18.67%	100%
		F	35	215	50
	F	11.67%	71.67%	16.67%	100%

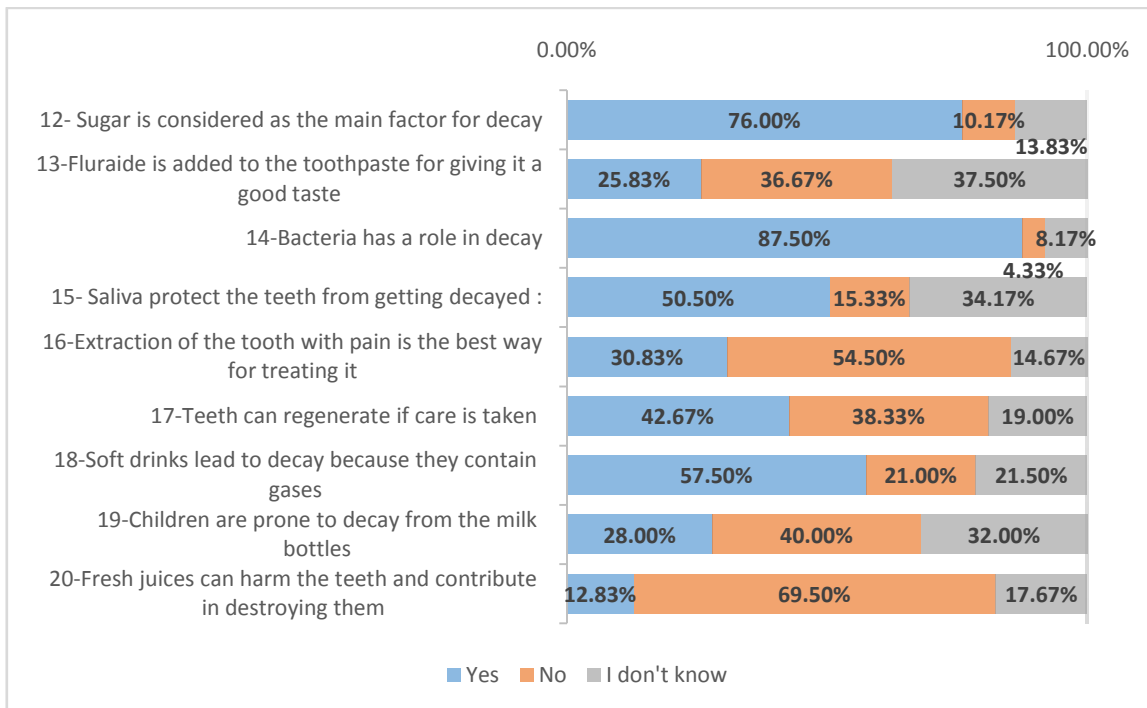


Figure 2:- Percentage of total students' responses regarding knowledge about caries

The data in figure 3 shows the percentage of good behavior and incorrect behavior among Taif university students. The good behavior included : (brushing twice or more daily , spending 2 -3 minutes while cleaning the teeth , replacing the toothbrush every 3-4 months , cleaning the tongue once or more daily ,using dental floss once or more daily , using mouthwash , visiting the dentist for periodic examination , reduced frequency of eating candies and biscuits and drinking soft drinks , non-smoking , using not more than one spoon of sugar with tea or coffee).

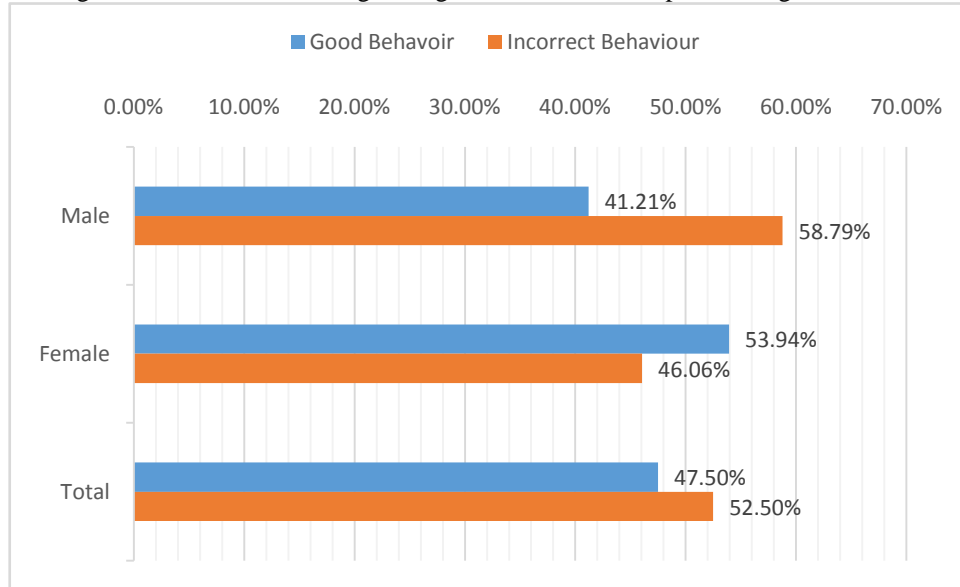


Figure 3:- The oral hygiene behavior among Taif university students

The data in figure 4 shows the percentage of Taif University students who have the correct knowledge about caries compared with people who lack that knowledge. The knowledge assessed include: (The role of sugar and bacteria in developing caries , the protective role of saliva and fluoride , the importance of preserving teeth from extraction , ability of teeth to regenerate , role of milk bottles to develop decay in children)

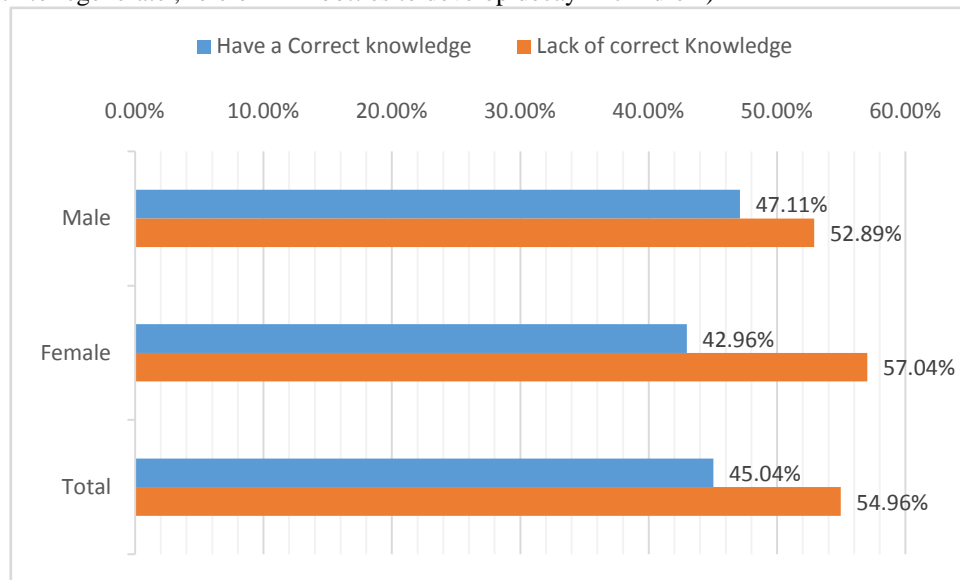


Figure 4:- The knowledge about caries among Taif university students

Discussion:-

This research presents; to the best of our knowledge, new data as no researcher has investigated the oral hygiene behavior or the knowledge of caries among students in Taif University or even among population in Taif. The first part of the questionnaire revealed a huge negligence on the using of mouthwashes and dental floss as 73.33% of the

sampled student (the males more than the females) don't include the use of dental floss in their oral hygiene routine, but it's still better compared to a study reported 89% who don't use the dental floss in Denmark^[15] and 83.2% in Iran [16]. Also about 58.33% of the sampled student (the males are more than the females) don't use a mouthwash. Regarding tooth brushing about 44.33% of the sampled students follow the international guidelines that indicate brushing at least twice a day, and our result is in the range of other studies which reported such tooth brushing frequency by 19–46% of patients in Lithuania, Saudi Arabia(Riyadh), and Japan^[13-14]. It's also noticed that women had higher odds of brushing teeth twice a day than men and that is parallel with other findings^[17-18]; 34.17% brush their teeth once a day and 17% brush more than two times a day. A minor percent (approximately 9%) of sampled students do not use the toothbrush on a daily basis and we should consider them without hesitation. The behavior of visiting the dentist for periodic examination is minimum as most of the samples students (more than half) only visit the dentist when severe pain presents or when the pain starts, this finding is similar to another literatures which found that about 60% of the subjects paid no attention to signs of caries if there was no pain^[19]. The consumption of candies and biscuits is more in female) than in males (about half of females consume them multiple times during the day). However, the males drink soft drinks and soda more than the females (about one third of males). In total, this study indicates high consumption of sugar which disagrees with results of Zhu *et al*^[19]. Our findings also show that smoking in males is more than in females obviously with only about one fifth of males practicing this unhealthy habit. The use of extra sugar with tea or coffee is unhealthy and it is considered as a factor for developing caries and other health problems; however, more than the half of sampled students use extra sugar which also contrast the results of Zhu *et al*^[19] and that should be taken into consideration. Lastly, figure 3 shows that more than half of the samples students practice incorrect oral hygiene methods (with the females practice less incorrect behavior than males). This noticed good oral hygiene behavior among women has been reported in various studies^[15,20,21]. This may be because women have flexible daily routine^[22] which is suggested to promote higher teeth cleaning behavior. Also, women are more motivated to follow oral hygiene behavior that might be due to the esthetic value which they care about.

The second part of the questionnaire revealed that majority of sample students know that sugar and bacteria are responsible for caries which is a positive aspect. Although half of the sample student think that saliva has no role in protection against decay or do not know if it has a role or not. Also the majority of sampled students think fluoride is added for taste or do not know if it is for taste or not. There is also lack of knowledge about the cause soft drink causing decay, the harmful effect of fresh juices on the teeth and the importance preservation of teeth in the majority of sampled students (more than half). Also, majority of sampled students (about two thirds) think that teeth can regenerate or do not know if it can or not. Finally, figure 2 shows that more than the half of sampled students lack the correct knowledge (females lack knowledge more than males) which does not coincide with a research that suggest females were having relatively more oral health-related knowledge^[23].

The results of the present study emphasize the need of oral health promotion programs to be conducted to increase the awareness and motivate the people to practice the correct and last current oral hygiene behavior by explaining the importance of preserving the teeth and illustrating the oral diseases that could develop if the recommendations are not followed.

Limitation of the study:-

This study is giving baseline information about oral hygiene behavior and knowledge among males and females but it does not take into consideration the effect of other variables such as the socio-demographic factor and the economic status of each subject. Another limitation is that this study just gives information regarding University students only and that necessitate the need for conducting more comprehensive study including large population samples.

Conclusion:-

The findings of the present study indicate that more than the half of students practice incorrect oral hygiene behaviors and they lack basic knowledge about caries and its related information, hence, this directs us to the importance of conducting oral health promotion programs to raise the awareness and motivate students to practice the ideal and correct oral hygiene behavior for the prevention from oral diseases.

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