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Oral Hygiene of Both Genders among Medical and Technical Institute Students in Erbil City (A Comparative Study)

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Abstract

Background: Different oral hygiene aids are important in influencing patient's ability caring of their teeth. Thus, this study aimed comparing oral hygiene among male and female students at Medical Technical Institute (MTI) and Technical Institute (TI) in Erbil city.

Materials and Method: A cross-sectional study was conducted among institute students. A total of 800 students (400 MTI: 240 males, 196 female), (400 TI: 209 males, 191 female) were individually asked requested information related to oral hygiene such as: tooth-brushing frequency, tooth-brushing technique, tongue brush, dental floss and toothpick.

Results: Concerning tooth-brushing frequency once/day male TI students showed highly significant difference (49.7%) at {p-value = 0.003} level more than male MTI students (36.7%) at {p-value= 0.003} level, for twice/day brushing frequency there was no statistical significant difference for both groups. Concerning gender: female of both groups MTI and TI students reported higher percentages concerning brushing frequency, tongue brush and dental floss than male. Female MTI (96.4%, 51%, 58%) at {p = 0.03, 0.009, 0.01} level more than male MTI (84.3%, 25.5%, 28%), female TI students showed (96.4%, 34.03%, 40.8%) at {p-value = 0.003, 0.08, 0.00} level than male TI (89.95%, 27.75%, 24.8%). In contrast to tooth- pick aid was more popular among male students of both groups (MTI 51%, TI 52.15%) at {p = 0.001, 0.00} level, also for vertical brushing technique male of both groups showed higher percentage more than female (MTI 55.4%, TI 47.84%) at {p = 0.06} level, finally for brushing time total male TI students brushed more than 2 minutes (43.5%) than MTI students (42%) at {p = 0.33} level.

Conclusion: The finding of this study had shown that both groups showed good oral hygiene, female of MTI and TI reported higher percentages than male regarding brushing frequency, tongue brush and dental floss in contrast to male of both groups applying vertical brushing technique and toothpick showed higher percentages than female of both groups. Brushing time more than 2 minutes was more prevalent among TI students, unlike brushing time for 2 minutes was prevalent in MTI students.

Keywords: Oral Hygiene; Frequency; Dental floss

Introduction

Oral health has remained as an integral part of an individual's general health and over all well-being. Tooth brushing twice a day is the recommended practice in the prevention and control of many diseases. However, the practice is varied and in some countries it is low.

Toothbrushes are the most widely used oral hygiene aids. It is the principal instrument in general use for accomplishing the goal of plaque control [1]. Several studies by [2,3] persons with regularly and higher frequency of tooth-brushing had better oral hygiene for both genders [2,3]. Toothbrush and toothpaste are the most popular oral hygiene aids among Kurdish students [4]. Plaque reduction can be achieved by the mechanical activity of tooth-paste slurry in combination with a toothbrush and/or by using chemotherapeutic agents to reduce the volume of plaque. Soft or ultra-soft toothbrush bristles are recommended [5].

Maintaining good oral hygiene is one of the most important things for healthy teeth and gums. Good oral health not only enables a person to look and feel good, but it is also equally important in maintaining oral functions [6]. The practice of maintaining the mouth clean and healthy by brushing and flossing to prevent tooth decay and gum disease is described as oral hygiene [7]. As the inter-proximal areas of the dentition are also frequently affected by caries, inter-proximal cleaning represents an important aspect of oral self-care [8,9].

Aim of the Study

The aim of this study was to compare oral hygiene behavior of medical technical institute students (MTI) and technical institute students (TI) aged 18 - 25.

Material and Methods

A questionnaire was allocated randomly on 800 students. medical technical institute (MTI) (total no. 400, male = 204, female = 196) and technical institute students (TI) (total no. 400, male = 209, female = 191) age ranging between 20 - 23 years.

A questionnaire

A previously prepared self-administered questionnaires were allocated to the participants through a personal interview. Informed consent was obtained verbally from each participant. The protocol of this study was approved by the supervisor and dental students. which were fully explained to the participants. Formal participants were asked about the: behavior toward their oral hygiene wither they could brush their teeth or not, tongue brush, dental floss (wooden) (yes, no), dental thread, daily frequency of tooth brushing > twice, once time/day.

Statistical analysis

Data management and Statistical analysis: Data will be recorded on a specially designed questionnaire, collected, and entered in the computer and then analyzed using appropriate data system which is called Statistical I package for social science (SPSS) version 22 and the result will be compared between students with different variables with Statistical significance level of ti 0.05, the result will be presented as percentages in tables using chi-square test.

Results

Table 1a showed that female of MTI students brushed their teeth in a higher percentage (41%) more than male MTI (36.71%) concerning once day brushing frequency with no Statistical significant difference between them, while for twice day brushing frequency female MTI students (42.3%) brushed more than male MTI (21%) with a highly significant difference at (P = 0.001) level, for TI students, according to once day brushing frequency there was no Statistical significant difference between male and female students. But for twice day frequency, female TI reported higher percentage (42.3%) more than male TI (26.3%) with Statistical significant difference at (P = 0.0003) level.

Table 1b showed that there was a highly Statistical significant difference among male of TI (49.7%) and male MTI (36.7%) concerning once day brushing frequency at (P = 0.003) level, concerning more than twice day brushing frequency male MTI (19.4%) brushed more than male TI (9.1%) with a highly significant difference at (P = 0.00) level while for other variables there were no Statistical significant difference.

Frequency of tooth brushing (MTI)	Female Number - %		Male Number - %		Z-score	P. Value
Once	81	%41	72	%36.7	5.32	0.42
Twice	83	%42.3	41	%21	4.63	0.001 * A
More than two	18	%9	38	%19.4	20.11	0.02
Sometimes	7	%3.6	21	%10.8	6.19	0.03
Zero	7	%3.6	32	%16.3	4.5	0.02
Total	196		204	%100		
Frequency of tooth brushing (TI)	Female Number - % female		Male Number - % male		Z-score	P. Value
Once	88	%46	104	%49.7	0.73	0.230
Twice	83	%42.3	55	%26.3	3.39	0.0003 *B
More than two	17	%8.9	19	%9.1	0.66	0.25
Sometimes	1	%0.5	20	%9.6	43.65	0.00
Zero	2	%1.1	11	%5.3	10.14	0.00
Total	191	%100	209	%100		

Table 1a: Number and percentages of frequency of tooth brushing among male and female.

MTI and TI students:

A* P = 0001 highly significant difference between female and male. MTI: Twice day brushing frequency.

B* P = 0003 highly significant difference between female and male. TI: Twice day brushing frequency.

Frequency of tooth brushing	Female no. and% MTI	Males No.% MTI	Female no. and% TI	Males No.% TI	P-value Between females	p-value between males
Once	81 %41	72 %36.7	88 %46	104 %49.7	0.16	0.003 *A
Twice	83 %42.3	41 %21	83 %42.3	45 %23.3	0.5	0.153
More than two	18 %9	38 %19.4	17%8.9	19 %9.1	0.21	0.00 *B
Some times	7 %3.6	21 %10.8	1%0.5	30 %13.0	0.00	0.00
Zero	7 %3.6	37 %16.3	2 %1.1	11%5.3	0.000	000
Total	196 %100	204 %100	191 %100	209 %100		

Table 1b: Comparing Tooth brushing frequency of MTI and TI students (both genders).

A* P = 0003 highly significant difference among male of MTI and TI students once day brushing frequency.

B* P = 0.00 highly significant difference among male of MTI and TI students more than two per day brushing frequency.

Table 2a revealed that female MTI students showed higher percentages than male MTI concerning tooth brushing application, tongue brush and dental floss (96.4%, 51%, 58%) (84.3%, 25.5%, 28%) respectively with Statistical significant difference at (P = 0.03, 0.009, 0.01) level except for tooth-stick application male MTI percentage was higher (51%) than female MTI (35.7%) with statistical significant difference at (P = 0.001) level.

Table 2b Female TI students reported higher percentages concerning tooth-brushing, tongue brush and dental floss (96.4%, 34.03%, 40.8%) more than male TI students (89.95%, 27.75%, 24.8%) at (P = 0.003, 0.08, 0.003) level respectively except for tooth-stick application male TI reported higher significant percentage (52.15%) more than female TI (31.93%) at (P = 0.00) level.

Oral hygiene aids\sex	Male				Female				Total		Z score	P. Value
	Yes	-	No		Yes	-	No		N	- %		
Brushing tooth+tooth pate	172	%84.3	32	%15,7	189	%964	7	%3.6	400	%100	4.20	0.03 *A
Tongue brush	52	%25.5	152	%74.5	100	%51	96	%49	400	%100	3.32	0.009* B
Tooth stick	104	%51	100	%49	70	%35.7	126	%64.3	400	%100	3.11	0.001* C
Dental floss	57	%28	147	%72	114	%58	82	%41.8	400	%100	0.22	0.01 * D

Table 2a: Comparing of male and female students of medical technical institute MTI students according to their use of oral hygiene aids.

A* P value=- 0.03 female MTI more than male MTI with significant differences regarding brushing teeth

B* P-value = 0.009 female MTI more than male MTI with significant differences regarding Tongue brush

C* P- value = 0.001 male MTI more than female MTI with significant differences regarding tooth stick

D* P-value = 0.01 female MTI more than male MTI with significant differences regarding dental floss.

Oral hygiene aids\se x	Male				Female				Total		Z-score	*P. Value
	Yes	-	No		Yes	-	No		N	- %		
Brushing tooth	188	%89.95	21	%10.0	18	%96.4	2	%1.1	400	%100	2.69	0.003* A
Tongue brush	58	%27.75	151	%72.2	65	%34.03	126	%65.96	400	%100	1.36	0.08* B
Tooth stick	109	%52.15	100	%49	61	%31.93	130	%68.0	400	%100	4.17	0.00* C
Dental floss	52	%24.8	157	%72.2	78	%40.8	113	%59.16	400	%100	3.43	0.003* D

Table 2b: Comparing male and female. TI students according to their use of oral hygiene aids.

A* P value=- 0.003 female TI more than male TI with highly significant differences regarding brushing teeth

B* P-value = 0.09 female TI more than male TI with significant differences regarding tongue brush

C* P- value = 0.00 male TI more than female TI with highly significant differences regarding tooth stick

D* P-value = 0.003 female TI more than male TI with highly significant differences regarding dental floss.

Table 2c showed different results, concerning tooth-brushing male TI brushed in a higher percentage (89.95%) more than male MTI (84.3%) with statistically significant difference at (P = 0.04) level with no statistical significant difference between female of both groups, while female MTI applied tongue brush (51%) in a higher percentage than female TI (34.03%) with significant difference at (P = 0.00) level, with no significant difference between male of both groups. For tooth-stick there was not statistically significant difference between male and female of both

groups. Finally, dental floss application exhibited that female and male MTI students were higher (58%, 28%) than female and male TI student (40.8%, 24.8%) with significant difference at (P = 0.00, 0.002) level.

Table 3a showed that male MTI students applied vertical method in toothbrushing (55.4%) more than female MTI (42.3%) with highly significant difference at (P = 0.004) level, but for horizontal method there was no statistical difference between them but, for those who don't brush, female MTI was higher (16.3%) than male MTI (3.4%) with statistical significant difference at (P = 0.00) level.

Oral hygiene aids\sex	Male MTI	Female MTI	Male TI	Female TI	P value males	P value females
Brushing tooth	172 %84.3	189 %96.4	188 %89.95	189 %96.4	0.04 *A	0.5
Tongue brush	52 %25.5	100 %51	58 %27.75	65 %34.03	0.30	0.00 *B
Tooth stick	104 %51	70 %35.7	109 %52.15	61 %31.93	0.41	0.21
Dental floss	57 %28	114 %58	52 %24.8	78 %40.8	0.00 *C	0.002 *D

Table 2c: Statistical analysis of both genders of MIT students according to use of oral hygiene aids.

A* P value- = 0.04 male TI more than male MTI with significant differences regarding brushing teeth

B* P-value = 0.00 female MTI more than female TI with significant differences regarding tongue brush

C* P- value = 0.00 male MTI more than male TI with highly significant differences regarding dental floss

D* P- value = 0.002 female MTI more than female TI with highly significant differences regarding dental floss.

Method\sex	Number - % female		Number - % male		Z-score	p-value
Vertical	83	%42.3	113	%55.4	2.61	A* 0.004
Horizontal	81	%41.3	84	%41.2	0	0.5
Not brush	32	%16.3	7	%3.4	4.14	B* 0.00
Total	196	%100	204	%100		

Table 3a: Number and percentages MTI students according to their methods of tooth brushing.

A* P-value = 0.004 highly significant difference male and female MTI student in vertical brushing technique.

B* P-value = 0.00 highly significant difference male and female MTI student in not brushing.

Table 3b expressed that female TI in both vertical and horizontal method higher percentages (51.83%, 47.1%) than male TI (47.84%, 42.1%) respectively with no statistical significant difference between them, but for those who don't brush, male TI had higher percentage (10.04%) than female TI (1.1%) with statistical significant difference at (P = 0.37) level.

Table 3c showed that most MTI and TI students (both genders) brushed their teeth in vertical methods but male MTI (55.4%) more than male TI (47.84%) with significant difference at (P = 0.06) level, while female TI (51.88%) more than female MTI (42.3%) with Statistical significant difference at (P = 0.05) level.

Method\sex	Number - % female		Number - % male		Z-score	p-value
Vertical	99	%51.83	100	%47.84	0.79	0.21
Horizontal	90	%47.1	88	%42.1	1	0.15
Not brush	2	%1.1	21	%10.04	0.32	0.037*
Total	191	%100	209	%100		

Table 3b: Number and percentages of TI students according to their methods of tooth brushing.

*p =.037 statistical significant difference between male and female of not brushing.

Table 4 revealed that most MTI students brushed for 2 minutes, female MTI (46%) was higher than male MTI (39.21%) with non-significant differences, while most of TI students brushed for more than 2 minutes, female TI (46%) was higher than male TI (41%) with non-significant difference. But when we compared the same gender of both groups, for those who brushed for 2 minutes female MTI (46%) was higher than female TI (32.98%) with non-significant difference at (P = 0.19) level but for male MTI (39.21%) was higher than male TI (33.49%) with non-significant difference at (P = 0.10%) level. For more than 2 minutes, female TI (46%) was higher than female MTI (33.7%) with highly significant difference at (P = 0.004) level but, male TI (41%) was higher than male MTI (29.4%) with non-significant difference at (P = 0.33) level.

Discussion

This study clarified that majority of students of both groups of both genders brushed their teeth in a higher percent- age MTI (90.52%) and TI (94.25%), this is in accordance with the result of Sabbah., *et al.* 2007 [9]. Concerning brushing frequency once time/ daily MTI (38.25%), TI (42%) students' percentages were greater than [7,10] but equal to [4,11] in Erbil city (33.8%), for twice frequency also MTI (31%), TI (34.5%) students' percentages were greater than [7,10,12-15] but less than [16-18] and equal to [4,19].

Time	Male TI	Female TI	Male MTI	Female MTI	P value males	P value females
One min	32 (%15.3)	37 (%19.3)	30 (%14.7)	35 (%17.9)	0.43	0.35
Two min	70 (%33.49)	63 (%32.98)	80 (%39.21)	88 (%46.)	0.19	0.10
More than 2min	86 (%41)	88 (%46)	60 (%29.4)	66 (%33.7)	0.33	0.004*
Not brush	21 (%14.8)	3 (%1.5)	32 (%15.68)	7 (%3.5)	0.41	0.00
Total	209 (%100)	191 (%100)	204 (%100)	196 (%100)		

Table 4: Number and percentages of students according to tooth brushing time.

*p-value = 0.004 highly significant difference between females of MTI and TI in more than two min brushing.

Concerning gender

Females generally in both groups exhibited higher percentages in tooth brushing frequency once/twice time daily, they have been said to have better oral health knowledge and exhibited greater interest in oral health more than males, this is in consistence with the findings of other studies [4,17,20-26], also females acted more positively towards oral health than males in tooth brushing, dental floss and tongue brush because females always care for their appearance, this result is in consistence with the findings of other studies [24,27-29]. Generally, MTI (42.75%), TI (32%) students' application dental floss percentages were greater than [7,17] although Canadian Dental Hygiene Association concluded that flossing with any type of floss is an effective method of interproximal plaque removal with the critical note that other methods of interdental cleaning are warranted for some clients and/or for certain oral sites [30]. Also female MTI students applied tongue brush in a

higher percentage (51%) more than female TI students (34.03%) with no difference for both male groups, this result may be due to oral health education knowledge (experimental and traditional) are repeated for MTI students with either method included in their curriculum to keep its positive results which confirmed our results for female of MTI students for application of tongue brush, these results are in accordance with other studies [24,27,31-34], but this percent- age was higher than [7] whose (22.3%) of total sample cleaned with tongue brush.

Concerning brushing technique

Females also showed higher results for both vertical and horizontal technique brushing methods more than males of both groups because females always care for their appearance [24,27-29], also for brushing time for 2 minutes and more than 2 minutes for both groups, again females showed higher results more than males this

may be due to that both groups females acquired knowledge from school, television, family, internet, publication more than males, this result is in accordance with [24,35,36]. Regarding brushing time for two minutes, both genders of MTI students showed higher percentages than both genders of TI students, MTI students exhibited better knowledge since dentists are an important source of dental knowledge of oral disease prevention for general public [24,37-43]. For brushing more than 2 minutes, our study showed that both genders of TI students' higher percentages than MTI students, this result may vary according to their background and professional factors, also TI showed higher results in once time brushing more than MTI students. Males TI students percentages were greater than male MTI students with non-significant difference for both groups, these results may be due to that they brush without knowledge about proper brushing method. For tooth stick application no statistical significant difference between both genders of both groups except TI male students percentages was better than female TI students, so health care providers might need to focus more on improvement of oral health knowledge, behaviors and practices specially in males [24]. Furthermore, oral health campaigns should switch focus from people's education to oral health knowledge, practice and action, so our result is in accordance with [24].

Concerning brushing technique most MTI (49%), TI (45.75%) students both genders brushed in vertical way, this result confirmed [44] result study in 2014 which stated that vertical brushing method had demonstrated to remove plaque more from the inter-proximal surfaces than horizontal method and that only (41.25%) of total sample brushed in horizontal way, and the result of our study is in contrast with [45] in 2017 who reported that (44.5%) of both genders brushed in horizontal way, he stated that horizontal scrubbing is the best brushing technique of choice in younger patients [45].

Concerning brushing time for 2 minutes: MTI students of both genders showed better results than TI students of both genders, MTI (42%), TI (33.25%) both genders, this result is greater than [10] who stated that only (22.3%) of respondents brushed for 2 minutes, this means that MTI students have better knowledge of oral disease prevention and dental clinic could be the most effective

location for dental university students to improve oral health behavior, they exhibited better type of cleaning time [37-43], so in this study we focused on oral knowledge of MTI and TI students, we had found differences associated with both groups that is (+) and (-) between them according to their background and professional facts, MTI students showed higher percentages in brushing for 2 minutes and dental floss more than TI students, this may be due to oral hygiene knowledge repeated for them by either method included in their curriculum to keep its positive results [46], this doesn't seem to be an equally appreciable impact on their oral health knowledge with almost part of them practicing recommended self-care measures [47]. This study also showed that percentage of participants comprehend dental floss was different, thus, explainable level of dental knowledge of dental floss might not completely imply oral health behavior [34], so further studies are required. TI student's oral knowledge concerning brushing frequency once/daily, brushing more than 2 minutes and tooth stick application specially males were better than MTI students, this result may be due to unawareness of knowledge of total oral health care and poor oral hygiene habits, so further studies are required to distinguish oral health aspects in their curriculum and to distinguish gender specific oral health beliefs. Females reported better knowledge more than males of both groups concerning tooth brushing, tongue brush and dental floss.

Conclusion

The source of dental knowledge from different sources between MTI and TI students as well as having dental knowledge were conflicting so further studies are required. Since students' knowledge in general toward dentistry are influenced by their background characteristics as well as self-perceived competency in giving dental care. Hence there is a need to include a syllabus on oral health in every institute department to correct wrong information and promote oral knowledge.

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