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ORIGINAL ARTICLE

Comparison of Oral Hygiene Status among Right and Left-Handed Individuals

AQSA IQBAL[1], SANA MASOOD[1], AMBRINA QURESHI[2], SADAF ARSHI[1]
[1]*Department of Community & Preventive Dentistry, Dr. Ishrat-ul-Ebad Khan Institute of Oral Health Sciences, Dow University of Health Sciences Ojha Campus Karachi*
[2]*Department of Community & Preventive Dentistry, Dow International Dental College Defence Campus Karachi*
Corresponding author: Aqsa Iqbal, Email: aqsa.iqbal@duhs.edu.pk

ABSTRACT:

Objectives: To assess difference in oral hygiene status among right- and left-handed individuals using different dental indices.

Materials and Methods: The research was conducted among two hundred and ninety-six students aged between 18 to 25 years. Data was collected using convenience sampling technique. Handedness was ascertained by using Edinburgh handed scale. Students were provided questionnaire to be filled about oral hygiene practices and oral examination was performed to assess DMFT, Plaque Index, Gingival Index and Oral Hygiene Index Simplified. Data was analyzed using SPSS software version 21.

Results: The study showed that 16.2% of the participants were males and 83.8% were females. Out of these 90.55% were right-handed and 9.5% were left-handed. It was observed that scores of left-handed individuals were higher with mean DMFT score (0.06), OHI-S score (1.71) and PI score (1.11) when compared to right-handed people. However, greater GI score was seen in right-handed (0.44).

Conclusion: This study concluded that individuals who are right-handed have better oral hygiene as seen by their better DMFT, OHI-S and PI scores and therefore lower frequency of dental caries.

Practical implication: The difference in oral hygiene status among right- and left-handed highlights the need to focus on manual dexterity that effects brushing efficiency and ultimately oral hygiene performance.

Keywords: Gingival health, Oral hygiene, Dental caries, Right- and Left-handedness, Manual dexterity

INTRODUCTION

Handedness, also known as dominant hand, is an individual's preference to use a hand with which one can perform tasks faster and more precisely[1]. The most common are right-handed that means they can perform tasks in a more skillful manner with their right hands constituting around 70-95% world's population[2, 3, 4]. On the other side, left-handed who perform tasks skillfully with their left hands are less common making up around 10% of world's population[5, 6]. In psychological studies, individual's preference of using a hand can be a bothering variable as left-handed are routinely excluded from studies[7]. Contrary, it can be useful while examining human behavior[8]. One review suggests that handedness as a variable can be most effective if used as a comparison between people who perform all manual activities with their dominant hand with those who perform at least one activity with their other hand[9]. It is emphasized that rather than focusing on direction of preference i.e., right versus left, researchers should focus on degree of handedness[10]. It is also stated that preference of right or left hand is related to localization of cerebral function, neuromuscular structure and genetic factors[11].

The process of dental caries involves demineralization of tooth surface by acid produced by bacteria present in dental plaque[12]. Dental plaque plays a major role in caries formation and causes dissolution of soluble magnesium and carbonates, followed by less soluble calcium and other ions, resulting in cavitation[13]. The relationship between dental plaque and periodontal disease has been investigated in clinical researches and several studies[14]. Removal of plaque from tooth surface is important for prevention of periodontal diseases as well[15]. Mechanical plaque control is an effective way of treating and preventing gingivitis and brushing plays the most important role to maintain oral hygiene[16]. The brushing efficiency is directly related to an individuals' manual dexterity. [8] Effective removal of bacterial plaque from tooth surface depends on both professional periodontal treatment, patient's individual care and motivation[17]. It's emphasized that brushing method, frequency and duration create significant differences in plaque removal[15]. Although there are some arguments about the effects of using right or left hand on dental plaque or gingivitis, it is supposed that use of right or left hand creates a difference and affects individual oral hygiene[18]. Therefore, the objective of this study was to assess difference in oral hygiene status among right- and left-handed individuals using different dental indices.

MATERIALS AND METHODS

Study design: This was a cross sectional and observational study.

Sample size: The present study was conducted on two hundred and ninety-six students.

Inclusion and exclusion criteria: The students aged between 18-25 years, medically fit having no chronic oral conditions were included in the study. The students who were mixed handed, non-consenting or having any systemic chronic conditions were excluded from the study.

Study procedure: Handedness was determined by questionnaire using Edinburgh handedness scale. [19, 1]

Development of instrument: Questionnaire was designed to record demographic details and oral hygiene practices. A structural proforma was designed to record DMFT (Decayed Missed and Filled Teeth), PI (Plaque Index), GI (Gingival Index) and OHI-S (Oral Hygiene Index Simplified). The intraoral examination was performed under daylight using sterilized mouth mirrors, sickle probes and CPITN instruments. DMFT index was used to determine caries experience. [20] PI assessed plaque accumulation on tooth surfaces. [21] GI measured gingival inflammation by assessing gingival bleeding. [22] OHI-S (Debris Index Simplified+ Calculus Index Simplified) determined oral hygiene status. [23,24]

Analysis of data: Data was analyzed using SPSS software (version 16) and reported in terms of frequencies, mean, standard deviation and comparison was done by applying independent t-test.

RESULTS

The study showed that 49.2% of students aged between 17-19 years of age and 57.1% students aged between 20-23 years of age. 16.2% of the participants were males where as 83.8% were females. Out of which 90.5% of people were right-handed while 9.5% were left-handed. (Table 1)

Table 1: Demographic Characteristics

Variable	N	Frequency (%)
Age		
18y-21y	127	49.2
22y-25y	169	57.1
Gender		
Male	48	16.2
Female Handedness	248	83.8
Right		
Left	268	90.5
	28	9.5

To check the frequency of oral hygiene practices among right- and left-handed people, a questionnaire was given to the students of Dow Institute of Biotechnology regarding their oral hygiene practices (e.g.; equipment, frequency and duration) and their dental visits. (Table 2)

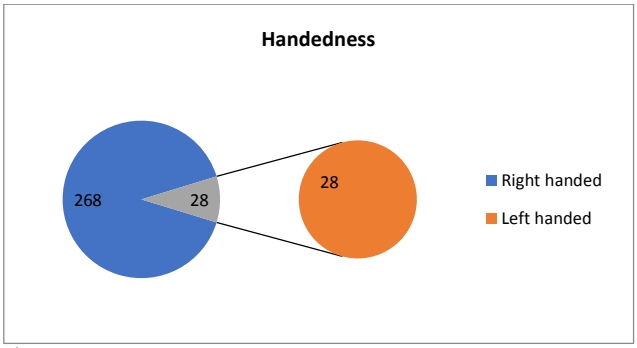

Figure 1:

Table 2: Frequency of Oral Hygiene Practices among Right- and Left-Handed People

Oral Hygiene Practices (OHP)	Number (n)	Frequency (%)
Cleaning Equipment		
Dental floss only	7	2.4
Brush + toothpaste only	249	84.1
Brush + toothpaste + dental floss	39	13.2
Don't know	1	0.3
Frequency of Brushing		
less than once a day	6	2.0
once a day	133	44.9
twice a day	150	50.7
more than twice a day	7	2.4
Quantity of Toothpaste		
full length of bristles	109	36.8
half-length of bristles	114	38.5
about the size of a pea	65	22.0
about the size of a grain of rice	8	2.7
Frequency of Flossing		
never	192	64.9
once a day	72	24.3
twice a day	24	8.1
thrice a day	8	2.7
Dental Visit		
once a year	41	13.9
twice a year	22	7.4
only when I have a tooth ache	123	41.5
I don't visit the dentist	110	37.2
Ignorance of Cleaning		
decay	17	5.7
gum disease	11	3.7
bad breath	35	11.8
all of the above	223	75.4
cause nothing	3	1.0
don't know	7	2.4
Time of Brushing		
only in the morning	128	43.2
only in the evening	8	2.7
in the morning and evening	160	54.1
Effects of excess sweets		
it's good for your teeth	3	1.0
it's bad for your teeth	261	88.2
it has no effect on your teeth	18	6.1
don't know	14	4.7
Effects of Fizzy Drinks		
it's good for your teeth	4	1.4
it's bad for your teeth	247	83.4
no effect on your teeth	23	7.8
don't know	22	7.4
Duration of Brushing		
about 30 seconds	56	18.9
about 1 minute	145	49.0
about 2 minutes	79	26.7
don't know	16	5.4

Higher the DMFT values mean greater the level of caries and its consequences. The mean scores of right-handed individuals were lower with DMFT 0.02, OHI-S 1.70 and PI 1.09 whereas left-handed subjects had lower GI score being 0.06. However, the statistically significant difference was observed in OHI-S (p-value < 0.001) and GI (p-value < 0.05) scores only. (Table 3)

Table 3: Comparison of Oral Hygiene Status between Right- and Left-Handed People

	Right-handed N (268)		Left-handed N (28)		p-value
	Mean	SD	Mean	SD	
DMFT	0.02	0.05	0.06	0.19	> 0.05
OHI-S	1.70	1.11	1.71	1.18	< 0.001
Gingival Index	0.44	0.62	0.37	0.49	< 0.05
Plaque Index	1.09	0.97	1.11	0.91	> 0.05

DISCUSSION

In this study, lower frequency of dental caries has been observed in right-handed individuals with better overall oral hygiene. It can be due to several factors that may involve criteria for selection, dietary pattern, mouth breathing, occlusal factors and tension to facial muscles, quantity and quality of salivary flow, medication effects, socioeconomic status and toothbrushing habits[25]. Some studies reported better oral hygiene in left-handed individuals but the results were not statistically significant when hand preference and toothbrush abrasion was compared[26]. When right- and left-handed individuals were studied in context to gender and brushing habits, statistically significant results were obtained for females having better oral hygiene as compared to males[27].

A less significant correlation was observed between knowledge related to oral hygiene and oral hygiene scores. However, manual dexterity of the right hand showed significant correlation with all oral hygiene scores. This status of better oral hygiene in right-handed people is similar to the studies conducted on forty-six elementary schools[2]. But it is characteristically different from research conducted on 28 people which concluded a better hygiene status in left-handed people[28].

The present study showed that the right-handed were far better in terms of oral hygiene as seen by lower DMFT score but to conclude that these individuals have better caries control is contrary to other studies where left-handed were found to have better oral hygiene status[28]. In another study, no significant relationship between manual dexterity and plaque control efficiency was observed[29]. Apart from manual dexterity, other factors can affect dental hygiene and caries prevalence including life styles, cultural values, socioeconomic status, dietary habits, educational level, psychology, toothbrushing habits, frequency and techniques, tobacco consumption and local and/or systemic diseases[30].

However, the unequal sample size in right- and left-handed is a limitation in this study and there is a need for further research to understand the effect of handedness along with other factors in determining oral hygiene and to use this information effectively to lower the burden of dental caries.

CONCLUSION

This study concluded that right-handed individuals have better oral hygiene as seen by their better DMFT, OHI-S and PI scores and therefore lower frequency of dental caries.

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