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**Awareness and behavior related to orthodontic treatment among
Jazan University students, Kingdom of Saudi Arabia**

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Essamet M. and Darout I. A.

Full Length Research Paper

Awareness and behavior related to orthodontic treatment among Jazan University students, Kingdom of Saudi Arabia

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Awareness of malocclusion and the need to make corrections have increasingly become prevalent among young population. The demand for orthodontic treatment also became more noticeable in dental practices. The aims of the present study were to assess Jazan University students, with respect to awareness and behavior related to orthodontic treatment and the effect of gender differences on the distribution of oral health related knowledge. Self-reported questionnaires were distributed to be completed by the participants from the medical and health sciences and non-medical sciences students. These students were selected at random after having read a consent letter. Five hundred and ten (259 medical and 251 non-medical students (males 222 and 288 females) with age range 19-28 years completed the questionnaires. The data were processed and analyzed by means of the Statistical Package for Social Sciences (SPSS version 17, Institute Inc., USA). Totally, 69% males and 64.1 females scored highly in knowledge of orthodontic treatment. The corresponding rates regarding orthodontic related behavior were 39.8% males and 32.6% females, respectively. Oral health and its relation to orthodontic treatment was confirmed by 64.9% males and 59.6% females in knowledge of caries and the corresponding rates regarding gingivitis were 58.5% and 55.2% respectively. The scores on orthodontic treatment information were 50.1 males and 45.1 females, respectively. Awareness and knowledge of orthodontic treatment and related behavior were high but specific misconceptions exist. There is no statistical difference between males and females in knowledge and behavior related to oral health among Jazan University medical and health sciences and non-medical students.

Key words: Awareness; malocclusion; aesthetic problem; oral health behavior.

INTRODUCTION

Oral health can affect the general health and well-being of humans. In many of countries, large numbers of young aged groups are unaware about the causes, occurrence

and prevention of most oral diseases (Siddegowda, 2013). One of the most common dental problems along with dental caries, periodontal and gingival diseases, is

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malocclusion (Dhar et al., 2007). Malocclusion can be defined as an occlusion with mal-relationship between the arches in any of the planes or anomalies in tooth position beyond the normal limits are considered one of the most common oral diseases (Bhullar and Nirola, 2012). Maloccluded teeth can cause psychosocial problems related to impaired dentofacial aesthetics to patients; in addition, it can affect oral health by increasing the prevalence of dental caries and periodontal diseases as well as temporo-mandibular disorders (Bhullar and Nirola, 2012). The etiology of malocclusion can be genetic or environmental and/or combination of both along with various local factors such as oral habits, like thumb sucking, early milk teeth extraction and tooth anomalies.

In developed countries where community-oriented preventive oral health programs are implemented, there has been an increase in awareness of orthodontics as a dental specialty in children as well as adults (Anita and Asiya, 2010). However, in many of the developing countries, a large number of young populations are unaware of the causes, occurrence and prevention of malocclusion. The correction of malocclusion into stable occlusal relationship can be brought by means of orthodontic appliances. Thus orthodontic function is to restore pleasant smile and esthetics with healthy masticatory function (Francesca et al., 2015). Moreover, the benefits of orthodontic treatment include improved oral health and enhanced psychological wellbeing. It has been demonstrated that orthodontics treatment is mainly influenced by the desire to look attractive, have self-esteem and self-perception of dental appearance (Bhatarai et al., 2011). The success of the orthodontic treatment depends on many factors including the compliance of the patient and the level of awareness and attitude of the patients. Oral hygiene during orthodontic treatment is always intensified to prevent any further periodontal disease (Francesca et al., 2015). In the absence of oral hygiene maintenance during orthodontic treatment, dental plaque accumulation on orthodontic appliance can cause dental caries and destruction of periodontal tissues. In this period a large part of tooth surface is covered by orthodontic appliances and make difficult for the patient to maintain good oral hygiene (Berlin-Broner, 2012). Thus, the level of knowledge and behavior of orthodontic patients towards oral health during orthodontic treatment is most recommended.

An adequate alignment among the teeth and inter-digitation between the arches can prevent gum recession, trauma to the teeth, dental caries, gum diseases and possible loss of teeth in some individuals. Moreover, the treatment of malocclusion reduces the suffering among the patient and social embracement. Thus, it is becoming important to identify the awareness levels of young population with respect to oral health and the orthodontics treatment because these are advantageous in preventing further malocclusion complications (Hamilton and Coulby, 1991). The level of knowledge of

gender and age related attitude and behavior may guide and assist the orthodontist in educating potential patients in providing advice. Although the demand of orthodontic treatment has been increasing in the Kingdom of Saudi Arabia and especially in Jazan region, the level of awareness of the patients seeking to improve their facial appearance and good oral health have not been investigated in the region. In addition, the awareness level of oral hygiene during orthodontic treatment in relation to habits like khat chewing (catha edulis plant found in the flowering evergreen tree or large shrub of Celastraceae family) commonly practiced in this region with shamma dipping (smokeless tobacco) and smoking (Alsanosy et al., 2014), which can negatively affect the oral health and orthodontic treatment have not been yet investigated.

Studies have shown that the oral hygiene status of khat non-chewers was significantly better than that of khat chewers and that the incidence of gingival bleeding was significantly higher in khat chewers (Mengel et al., 1996). One study showed that about 23% of khat chewers complained of difficulty in mouth opening, as compared with only about 1% of non-chewers. A burning sensation in the soft tissues was also found in a higher proportion of khat chewers (Abudalwhab and Al-Kholani, 2010). The level of awareness and behavior related to orthodontic treatment of Jazan University students has not been published on line. We formulated our working hypothesis, as a result of long existing problems of malocclusion in the region that Jazan University students have low awareness and behavior related to orthodontic treatment. We then tested our hypothesis by setting up a null hypothesis that Jazan University students have high awareness and behavior related to orthodontic treatment. Thus any differences between high and low settings are considered inconsistency with null hypothesis.

The aims of the present study were therefore, to assess Jazan University students, with respect to awareness and behavior related to orthodontic treatment and the effect of gender differences on the distribution of oral health related knowledge and behavior.

MATERIALS AND METHODS

The study was carried out over a period of 2 months during autumn 2015 at the Jazan University campus, which is located in Jazan town, Southwest of Kingdom of Saudi Arabia. The total study population was estimated 2000 students and by using convenience sampling method five hundred and ten students were randomly selected to be involved in this study. The study population included students of medical and health sciences colleges and non-medical colleges of Jazan University. The medical and health sciences colleges include Medical, Nursing and Pharmacy Colleges and the nonmedical colleges include Administration, Computer Sciences and Engineering Colleges. Questionnaires were randomly distributed to be reported by consent students.

Samples and procedures

Self-reported questionnaires were given to student representatives

from each category of medical and health sciences colleges and non-medical colleges of Jazan University and asked to be distributed randomly, after identification of different colleges representatives the questionnaires were then distributed in lecture rooms randomly to the participants. The participants joined the study after having read a consent letter and accepted to participate. Refusals were replaced by random distribution of new questionnaires.

Survey instrument

The study involved distribution of a pre-coded questionnaire constructed in English by the authors and then translated to local Arabic language to be clearly understood by the participants (Darout et al., 2014). The questionnaire contained questions assessing socio-demographic characteristics and a number of variables related to knowledge and awareness of orthodontic treatment, oral health and its relation to orthodontics and causes of oral diseases and means of their prevention, including tooth cleaning. Prior to the distribution of the questionnaires, the principal investigator explained to the participants the aims of the study, gave examples on how to complete the questionnaire adequately and offered immediate assistance with the completion, if required.

Measurements

Gender was assessed as male/female; age was grouped into ≤ 21 years-old and ≥ 22 years old. Bad habits like khat or qat chewing, shamma dipping and smoking which can negatively affect the oral health and orthodontic treatment were assessed as no or yes. Moreover, the participants were requested to evaluate the following five statements regarding causes of oral diseases in terms of yes/no/don't know: Caries can occur by: bad cleaning; not visiting a dentist; having crowded teeth; having microorganisms in the tooth; and that crowded teeth can accumulate plaque bacteria. A sum index of knowledge about caries was constructed (range 1-5) and reduced to a dummy variable high knowledge and low knowledge based on a median split. Using the same response scale students were requested to evaluate four statements about the causes of gingivitis: irregular tooth brushing; not visiting a dentist; having bacteria in the gum; having crowded teeth. A sum score of knowledge about gingivitis was constructed by adding the four items. This sum score was dichotomized based on a median split into high knowledge and low knowledge. Using the following response scale students were requested to evaluate four statements about the knowledge of orthodontic treatment: a dentist can do orthodontic treatment; orthodontic treatment is the job of orthodontist; if the respondents complain from irregular teeth; respondents seen crowded teeth; teeth alignment is good for esthetic and appearance. A sum index of knowledge about orthodontic treatment was constructed (range 1-5) and reduced to a dummy variable high knowledge and low knowledge based on a median split. Using the response scale students were requested to evaluate four statements about the causes of misalignment: sum sucking; early milk teeth extraction; genetic factors. A sum index of knowledge about causes of teeth misalignment was constructed (range 1-3) and reduced to a dummy variable high knowledge and low knowledge based on a median split. Moreover, 5 statements about the knowledge of orthodontic treatment information were evaluated; a sum index of information about orthodontic treatment was constructed (range 1-5) and reduced to a dummy variable high knowledge and low knowledge based on a median split.

Statistical analysis

The data were processed and analyzed by means of the Statistical

Package for Social Sciences (SPSS version 14.0, Institute Inc., Cary, NC, USA). Frequency distributions of variables were computed separately for medical and non-medical, male and female students. Contingency tables were made and the Chi-square test was used for comparisons. Differences with a $p < 0.05$ were considered statistically significant.

Ethical considerations

The study proposal was submitted to College of Dentistry Research and Publication Office for ethical clearance and the written informed consent was obtained from the participants prior to study commencement. In this concern, it has been stated to the participants that there is no direct benefit of their participation in the study; however, knowledge gained from the study may lead to the prevention and treatment of malocclusion (general population benefits) and about the confidentiality, that no information about the participants, or provided by them during the research will be disclosed to others without their written permission.

RESULTS

The total participants were 510 students, 222 males and 288 females with age range 19-28 years, (mean age 22.32 years); of these 76 (29.3%) males and 86 (34.1%) females, respectively were at the age of ≤ 21 years, where 183 males (70.7%) and 164 females (65.9%) were at age ≥ 22 years. The results regarding distribution and number of the study participants according to the colleges and gender distribution are summarized in Figure 1. Bad habits like khat chewing, shammah dipping and smoking practiced by study participants were 90 (17.6%) for khat and 64 (12.5%) for shammah dipping and 117 (22.9%) for smoking, respectively. The effect of socio-demographic characteristics and bad habits practiced by the study participants are shown in Table 1. The oral health knowledge items in relation to orthodontics were divided into items of causes of caries and gingivitis; totally, 144 (64.9%) males and 172 (59.7%) females scored highly in knowledge of caries and the corresponding rates regarding gingivitis were 130 (58.5%) males and females 159 (55.2%) respectively. The percentage distribution and the numbers of the study participants who confirmed specific causes of dental caries and gingivitis are shown in Table 2. Totally, 153 (69%) males and 185 (64.1%) females scored highly in knowledge of orthodontics treatment. The corresponding rates regarding orthodontic related behavior were 88 (39.8%) males and 94 (32.6%) females, respectively. The scores on orthodontic treatment information were 111 (50.1%) males and 128 (45.1) females, respectively. The results showing percentage distribution and number of the study participants who confirmed specific need for orthodontic treatments and orthodontic related behavior are summarized in Table 3.

DISCUSSION

Epidemiological data regarding awareness and behavior

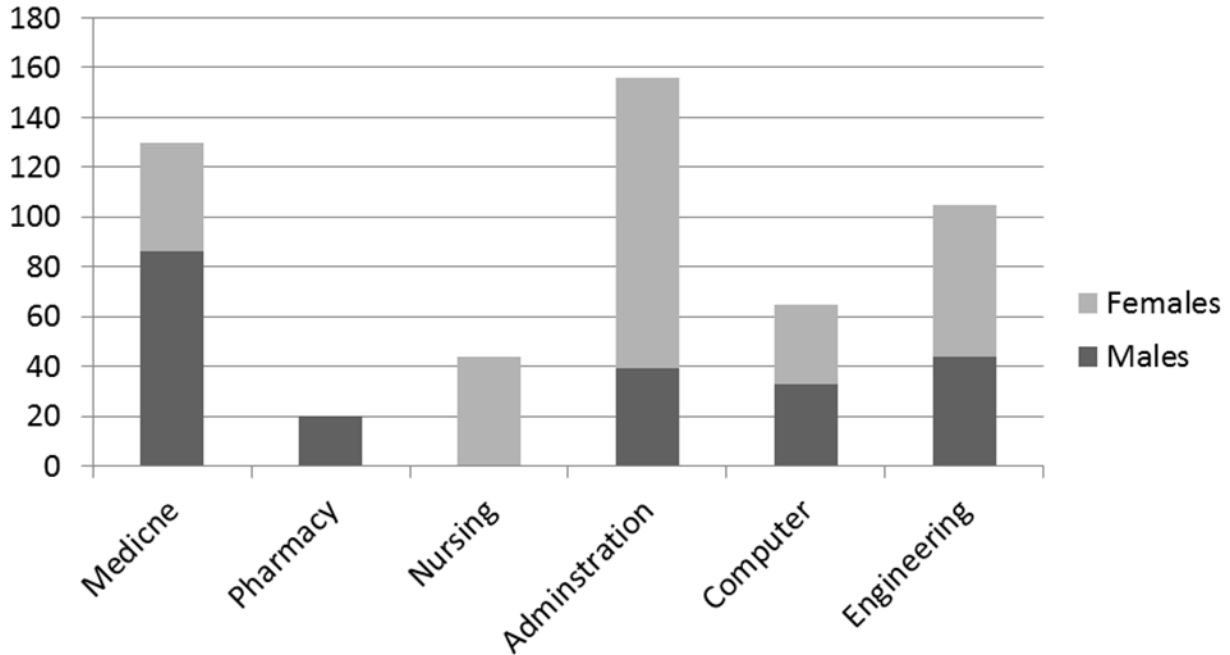


Figure 1. The number (n) and distribution of the study participants according to the gender and colleges.

Table 1. Percentage distribution (%) and numbers (n) of the study participant's socio-demographic characteristics and bad habits.

Socio-demographic characteristics	Medical colleges participants (n=259)		Non-medical colleges participants (n=251)	
	%	(n)	%	(n)
Age (years)				
≤ 21	29.3	76	34.1	87
≥ 22	70.7	183	65.9	164
Gender				
Females	59.8	155	52.9	133
Males	40.2	104	47.1	118
Bad habits				
Qat use	12	31	23.5	59
Shamma dipping	6.3	16	19.1	48
Smoking	12.4	32	33.9	85

related to orthodontic treatment and the effect of gender differences on the distribution of oral health related knowledge of Jazan University students have not previously been published online. This survey was undertaken to gather such information among the students to aid the establishment of preventive oral health education program. Thus, the participants of this study were selected because they were medical and health sciences and nonmedical students and are not currently involved in preventive oral health program. Therefore, this study considered them as pool sample with equal knowledge in the field of oral health in relation to orthodontic treatment related behavior.

Our study shows that all students correctly completed the questionnaires, which demonstrate keen interest of the students in their oral health and orthodontic treatment related matters. With increasing awareness about orthodontic treatment, the demand for the treatment is also increasing rapidly, particularly among the adult population. In addition, increased oral health awareness also means that patients are seeking a standard treatment. There are several reasons why one may seek orthodontic treatment. But orthodontists should lay more emphasis on prevention rather than cure. Preventive measures against malocclusion can reduce the amount of money needed for treatment. This can be ensured if

Table 2. Percentage distribution (%) and numbers (n) of the study participants who confirmed specific causes of dental caries and gingivitis.

Oral health knowledge items	Males (n=222)		Females (n=288)	
	(%)	(n)	(%)	(n)
<i>Causes of caries</i>				
Bad Cleaning	97.3	216	89.2	257
Avoid visiting dentist	67.1	149	72.1	208
Microorganisms	69.4	154	54.2	156
Crowded teeth	42.8	95	39.9	115
Crowded teeth and plaque	47.7	106	42.4	122
<i>Causes of gingivitis</i>				
Irregular tooth brushing	88.7	197	81.6	235
Avoid visiting dentist	61.3	136	58.7	169
Bacteria in the mouth	46.4	103	43.8	126
Crowded teeth	37.4	083	36.5	105

Table 3. Percentage distribution (%) and numbers (n) of the study participants who confirmed specific need for orthodontic behavior.

Orthodontics treatment	Males (n=222)		Females (n=288)	
	(%)	(n)	(%)	(n)
<i>Orthodontics treatment</i>				
Dentist job	69.8	155	77.8	224
Orthodontist job	47.7	106	49.6	143
Irregular teeth alignment	63.5	141	58.6	169
Seen crowded teeth	85.6	190	68.8	198
Teeth alignment is for good looking	78.4	174	65.6	189
<i>Causes of teeth misalignment</i>				
thumb sucking	48.6	108	45.8	132
Early milk teeth extraction	43.2	96	24.7	71
Genetic factor	27.5	61	27.4	79
<i>Orthodontics treatment knowledge</i>				
Teeth extraction for Ortho treatment	61.7	137	44.4	128
Earlier age for Ortho bracts	63.1	140	48.3	129
Ortho takes longer duration	44.1	98	45.1	130
Need for Ortho treatment	49.4	110	46.5	134
Advised by friends for Ortho	32.4	72	41.3	119

orthodontists educate the society and make the population to become aware of the malocclusion.

Less gender differences were identified in this study concerning the single oral health or awareness of orthodontic knowledge items. Our study results show that there is no significant difference between males and females in knowledge of orthodontic treatment and its related behavior; both sexes were highly knowledgeable in this study. Previously, in a multi-centric study in Nepal, Shrestha et al. (2014) demonstrated that 85% of orthodontic patients possess good knowledge about

ongoing orthodontic treatment and that about half of the patients are unaware about retainers.

Our finding of gender equality in knowledge and behavior related to oral health is consistent with previous study (Darout, 2014). These observations may indicate that when both sexes are at identical educational levels, they are equally knowledgeable with respect to oral health issues.

Although misconceptions about awareness and knowledge of orthodontics treatment and related behavior still exist in the present study, high proportions of male

and female students had correct knowledge of dental caries. The corresponding rates regarding gingivitis were also high, confirming for instance that crowded teeth and avoid visiting dentist can cause tooth decay and that gingivitis might be attributed to irregular tooth brushing. Previously, Farsi et al. (2004) indicate that 87% of the school students in Jeddah city knew that regular tooth brushing can prevent gum diseases. In this study, students at medical and health sciences colleges had more information in general about the orthodontic treatment than those in nonmedical colleges. Although habits like khat chewing and shamma dipping are very common in Jazan region (Alsanosi et al., 2013), only 12% in medical and health sciences colleges and 23.5% in nonmedical demonstrated khat chewing in our study. The level of knowledge about orthodontics treatment and oral health related matters identified among Jazan University students was encouraging and may have implications for preventive oral health program.

Thus, from a theoretical point of view, orthodontics related behavior is a function of perceived vulnerability to an oral disorder and the belief that a particular preventive measure will be sufficient to overcome this vulnerability (Tulloch et al., 1984). People who have assimilated oral health related knowledge and feel a sense of personal control over their oral health are more likely to adopt self-care practices (Almas et al., 2003). This study shows that awareness and knowledge of orthodontics treatment and related behavior were high but specific misconceptions exist and that there is gender equality in knowledge and behavior related to oral health among Jazan University students. However, self-reported information may need to be confirmed by clinical assessments or checked up from dental files. Therefore, the results of the present study may need to be confirmed by clinical assessments.

In conclusion, this study shows that awareness and knowledge of orthodontic treatment and related oral health behavior were high but specific misconceptions exist. There is no statistical difference found between males and females in awareness, knowledge and behavior related to orthodontic treatment and oral health among Jazan University medical and health sciences and non-medical students. Therefore, the results of the present study may need to be confirmed by clinical assessments.

Conflict of Interests

The authors have not declared any conflict of interests.

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