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# Attitude and Knowledge of Orthodontics among Egyptian Patients: A Cross-Sectional Survey

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## *ABSTRACT*

**Purpose:** This study was designed to assess the attitude and level of awareness of patients toward malocclusion and orthodontic treatment. Materials and methods: The study consisted of a sample of 237 (113 males and 124 females) outpatients attending the dental clinics of Ahram Canadian University. A questionnaire containing 15 questions concerned with the knowledge and attitude regarding orthodontics was filled and the survey data was collected. Simple descriptive statistics was used to compare questionnaire responses for the whole sample, while Chi-square tests were applied for gender comparison. Result: There was a significant difference between male and female awareness. The descriptive statistics showed that patients had higher level of knowledge for questions regarding orthodontics as a specialty, but lower level of knowledge for questions regarding malocclusion. Conclusion: Females were found to be keener to undergo orthodontic treatment than males. Cost and duration of treatment may present as barriers for orthodontic treatment. Also, there was deficiency in the information related to the ill effects caused by malocclusion and oral habits.

***KEYWORDS***

*Orthodontic awareness, orthodontic treatment, orthodontic knowledge, people's perception.*

## INTRODUCTION

Malocclusion is one of the most common dental problems that has an increasing prevalence [1-7] It may cause many ailing effects such as poor esthetics, functional limitations, speech defects as well as increase in the prevalence of dental caries and periodontal disease [8-13]. Occlusion has also a significant influence on how individuals perceive and evaluate other individuals [14,15]. Several studies concluded that young adults presenting severe malocclusion had a higher prevalence of poorer oral esthetics accompanied with poorer self-perception [16-19]. Therefore, providing proper orthodontic treatment has many positive effects on improving the quality of life [20- 22].

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The orthodontic treatment isn't defined only by the orthodontist, but also by the patient's perception of self-esteem and self- concept [23]. Hence, in order to increase the effectiveness of orthodontic treatment, patients' co-operation is needed [24]. The individual's perceptions of malocclusion and orthodontic treatment should be correlated with the actual clinical status in order to achieve more satisfactory treatment results [25].

Oral health knowledge is an important prerequisite for health-related behavior [26-28]. Patients' perceptions of orthodontics which include malocclusion and orthodontic treatment have a significant importance in determining treatment demand and collaboration with the orthodontist [29-31]. The main cause for the lack of orthodontic treatment for patients with malocclusion is the lack of information about the malocclusion and lack of awareness about the benefits of treatment [32-34]. The more aware the patients are of their dental problems and orthodontic treatments, the more will be their demand for a better quality of life and better co-operation during treatment [35-38]. Therefore, a conducted survey to assess the knowledge and attitude of patients about orthodontics is beneficial for better understanding and hence better planning for increasing the level of knowledge and reaching a more relevant attitude for patients.

The goal of this study is to evaluate the knowledge and attitude of patients, visiting dental clinics in Ahram Canadian University, toward orthodontics which includes malocclusion and orthodontic treatment.

## MATERIALS AND METHODS

Ethical clearance was obtained and the research approved by the Institutional Review Board Organization IORG0010868, Faculty of Oral and Dental Medicine, Ahram Canadian University by the research number IRB00012891 #10.

A cross-sectional study was carried out including a sample size of 237 (113 males and 124 females) outpatients attending the dental clinics in Ahram Canadian University. Epi-calc 2000 was used to calculate the sample size of the study. Assuming 80% power and 0.05 level of significance [32].

**Inclusion Criteria [35]:**

1. Patients in the age group of 18-25 years.
2. Patients that received or did not receive orthodontic treatment

**Exclusion criteria [35]**

1. Mentally compromised patients
2. Patients not fitting in the age group

A questionnaire consisting of two parts was used to collect data from patients [35]. The first part included the questions related to the demographic information of participants, such as age and gender. The second part consisted of a validated questionnaire that was comprised of 15 questions related to malocclusion and orthodontic treatment (table 1). The response of patients was in a form of three choices (Yes- No –Don't know). The questions were written in the English language and were explained to the patients in the Arabic language; therefore 10 questionnaires were used to check the validity and reliability of this method.

**Statistical Analysis**

The survey data was collected and organized into Microsoft Excel spreadsheets and the data was tabulated and computed in percentage using SPSS software version 24. Simple descriptive statistics were applied to describe the study variables and the Chi-square-test used for comparison of proportions with $P < 0.05$ considered statistically significant.

**Table (1)** *Questionnaire*

| Questions | Yes | No | Don't Know |
|---|---|---|---|
| Q1. Have you noticed people having irregular teeth? | | | |
| Q2. Have you heard of an orthodontist before? | | | |
| Q3. Do you know that irregular teeth can be aligned? | | | |
| Q4. Do you know the ill effects of irregular teeth? | | | |
| Q5. Are you aware that sometimes few teeth may have to be removed for aligning irregular teeth? | | | |
| Q6. Do you know that oral habits have ill effects on teeth? | | | |
| Q7. Have you noticed people wearing braces? | | | |
| Q8. Do you know the duration for braces is longer than other dental treatment? | | | |
| Q9. Are you aware that oral habits can be treated using orthodontic treatment? | | | |
| Q10. Are you aware about wearing retainers after aligning teeth? | | | |
| Q11. Are you aware that orthodontic treatment is costly? | | | |
| Q12. Were the braces a problem during your marriage proposal? | | | |
| Q13. Did you face any problem during marriage proposal due to misaligned teeth? | | | |
| Q14. Have you taken orthodontic treatment? | | | |
| Q15. After orthodontic treatment did you notice any change in your personality? | | | |

## RESULTS

The attitude and knowledge among participants toward malocclusion and orthodontic treatment was expressed in table 2. A total of 63.7% participants had not received orthodontic treatment, 21.1% had not seen people wearing braces, while 23.2% had not heard of an orthodontist before. 13.9% of participants did not notice other people having irregular teeth and 42.2% of participants did not know the ill effects of irregular teeth.

29.5% of participants did not know that irregular teeth can be aligned, while, 40.5% of participants weren't aware that sometimes few teeth may have to be removed for aligning irregular teeth. A total of 46% did not know that oral habits have ill effects on teeth and 48.9% weren't aware that oral habits can be treated using orthodontic treatment.

50.6% of participants knew that the duration for orthodontic treatment was longer than other dental treatments, 40.9% were aware about wearing retainers after aligning teeth and 71.7% were aware that orthodontic treatment is costly.

Regarding the attitude of participants toward orthodontic treatment, 25.7% had problems during their marriage proposal due to misaligned teeth, while 24.1% of participants had problems during marriage proposal due to wearing braces and 25.7% noticed positive changes in their personality after orthodontic treatment.

When the responses to questionnaires were compared between genders as represented by table 3 and figure 1, there was a significant difference in the number of females that had undergone orthodontic treatment than males. As shown in figure 2 and 3, responses appeared to have significant differences between males and females in that females had heard about orthodontists and had noticed people with braces more than males did. As represented in figure 4 and 5, it was also evident from the results that females significantly had more knowledge that irregular teeth can be treated by orthodontics and that retainers are used after orthodontic treatment than males had.

**Table (2)** *Knowledge and attitude of patients towards orthodontic treatment*

| Questions | | Number of participants | Percentages |
|---|---|---|---|
| Q1. Have you noticed people having irregular teeth? | Yes | 190 | 80.2% |
| | No | 33 | 13.9% |
| | Don't know | 14 | 5.9% |
| Q2. Have you heard of an orthodontist before? | Yes | 175 | 73.8% |
| | No | 55 | 23.2% |
| | Don't know | 7 | 3.0% |
| Q3. Do you know that irregular teeth can be aligned? | Yes | 145 | 61.2% |
| | No | 70 | 29.5% |
| | Don't know | 22 | 9.3% |
| Q4. Do you know the ill effects of irregular teeth? | Yes | 97 | 40.9% |
| | No | 100 | 42.2% |
| | Don't know | 40 | 16.9% |
| Q5. Are you aware that sometimes few teeth may have to be removed for aligning irregular teeth? | Yes | 116 | 48.9% |
| | No | 96 | 40.5% |
| | Don't know | 25 | 10.5% |
| Q6. Do you know that oral habits have ill effects on teeth? | Yes | 119 | 50.2% |
| | No | 109 | 46.0% |
| | Don't know | 9 | 3.8% |
| Q7. Have you noticed people wearing braces? | Yes | 173 | 73.0% |
| | No | 50 | 21.1% |
| | Don't know | 14 | 5.9% |
| Q8. Do you know the duration for braces is longer than other dental treatment? | Yes | 120 | 50.6% |
| | No | 82 | 34.6% |
| | Don't know | 35 | 14.8% |
| Q9. Are you aware that oral habits can be treated using orthodontic treatment? | Yes | 81 | 34.2% |
| | No | 116 | 48.9% |
| | Don't know | 40 | 16.9% |
| Q10. Are you aware about wearing retainers after aligning teeth? | Yes | 97 | 40.9% |
| | No | 100 | 42.2% |
| | Don't know | 40 | 16.9% |
| Q11. Are you aware that orthodontic treatment is costly? | Yes | 170 | 71.7% |
| | No | 38 | 16.0% |
| | Don't know | 29 | 12.2% |
| Q12. Were the braces a problem during your marriage proposal? | Yes | 57 | 24.1% |
| | No | 96 | 40.5% |
| | Don't know | 84 | 35.4% |
| Q13. Did you face any problem during marriage proposal due to misaligned teeth? | Yes | 61 | 25.7% |
| | No | 110 | 46.4% |
| | Don't know | 66 | 27.8% |
| Q14. Have you taken orthodontic treatment? | Yes | 84 | 35.4% |
| | No | 151 | 63.7% |
| | Don't know | 2 | 0.8% |
| Q15. After orthodontic treatment did you notice any change in your personality? | Yes | 61 | 25.7% |
| | No | 113 | 47.7% |
| | Don't know | 63 | 26.6% |

**Table (3)** *Comparison of responses to questions between genders*

| Questions | | Male | | Female | | Chi-Square | P value |
|---|---|---|---|---|---|---|---|
| | | N | % | N | % | | |
| Q1. Have you noticed people having irregular teeth? | Yes | 88 | 77.9% | 102 | 82.3% | 3.15 | **0.227** |
| | No | 20 | 17.7% | 13 | 10.5% | | |
| | Don't know | 5 | 4.4% | 9 | 7.3% | | |
| Q2. Have you heard of an orthodontist before? | Yes | 75 | 66.4% | 100 | 80.6% | 6.56 | **0.008** |
| | No | 33 | 29.2% | 22 | 17.7% | | |
| | Don't know | 5 | 4.4% | 2 | 1.6% | | |
| Q3. Do you know that irregular teeth can be aligned? | Yes | 56 | 49.6% | 89 | 71.8% | 12.38 | **0.002** |
| | No | 44 | 38.9% | 26 | 21.0% | | |
| | Don't know | 13 | 11.5% | 9 | 7.3% | | |
| Q4. Do you know the ill effects or irregular teeth? | Yes | 40 | 35.4% | 57 | 46.0% | 4.81 | **0.090** |
| | No | 56 | 49.6% | 44 | 35.5% | | |
| | Don't know | 17 | 15.0% | 23 | 18.5% | | |

| Questions | | Male | | Female | | Chi-Square | P value |
|---|---|---|---|---|---|---|---|
| | | N | % | N | % | | |
| Q5. Are you aware that sometimes few teeth may have to be removed for aligning irregular teeth? | Yes | 50 | 44.2% | 66 | 53.2% | 3.74 | **0.148** |
| | No | 53 | 46.9% | 43 | 34.7% | | |
| | Don't know | 10 | 8.8% | 15 | 12.1% | | |
| Q6. Do you know that oral habits have ill effects on teeth? | Yes | 59 | 52.2% | 60 | 48.4% | 5.036 | **0.079** |
| | No | 53 | 46.9% | 56 | 45.2% | | |
| | Don't know | 1 | 0.9% | 8 | 6.5% | | |
| Q7. Have you noticed people wearing braces? | Yes | 75 | 66.4% | 98 | 79.0% | 6.76 | **0.032** |
| | No | 32 | 28.3% | 18 | 14.5% | | |
| | Don't know | 6 | 5.3% | 8 | 6.5% | | |
| Q8. Do you know the duration for braces is longer than other dental treatment? | Yes | 54 | 47.8% | 66 | 53.2% | 3.79 | **0.150** |
| | No | 37 | 32.7% | 45 | 36.3% | | |
| | Don't know | 22 | 19.5% | 13 | 10.5% | | |
| Q9. Are you aware that oral habits can be treated using orthodontic treatment? | Yes | 39 | 34.5% | 42 | 33.9% | 0.536 | **0.764** |
| | No | 57 | 50.4% | 59 | 47.6% | | |
| | Don't know | 17 | 15.0% | 23 | 18.5% | | |
| Q10. Are you aware about wearing retainers after aligning teeth? | Yes | 35 | 31.0% | 62 | 50.0% | 9.08 | **0.011** |
| | No | 57 | 50.4% | 43 | 34.7% | | |
| | Don't know | 21 | 18.6% | 19 | 15.3% | | |
| Q11. Are you aware that orthodontic treatment is costly? | Yes | 76 | 67.3% | 94 | 75.8% | 3.12 | **0.212** |
| | No | 23 | 20.4% | 15 | 12.1% | | |
| | Don't know | 14 | 12.4% | 15 | 12.1% | | |
| Q12. Were the braces a problem during your marriage proposal? | Yes | 28 | 24.8% | 29 | 23.4% | 4.04 | **0.132** |
| | No | 52 | 46.0% | 44 | 35.5% | | |
| | Don't know | 33 | 29.2% | 51 | 41.1% | | |
| Q13. Did you face any problem during marriage proposal due to malaligned teeth? | Yes | 29 | 25.7% | 32 | 25.8% | 0.025 | **1.000** |
| | No | 53 | 46.9% | 57 | 46.0% | | |
| | Don't know | 31 | 27.4% | 35 | 28.2% | | |
| Q14. Have you taken orthodontic treatment? | Yes | 47 | 41.6% | 37 | 29.8% | 6.19 | **0.031** |
| | No | 64 | 56.6% | 87 | 70.2% | | |
| | Don't know | 2 | 1.8% | 0 | 0.0% | | |
| Q15. After orthodontic treatment did you notice any change in your personality? | Yes | 30 | 26.5% | 31 | 25.0% | 0.239 | **0.901** |
| | No | 52 | 46.0% | 61 | 49.2% | | |
| | Don't know | 31 | 27.4% | 32 | 25.8% | | |

*Significant at $P < 0.05$ N= number of participants*

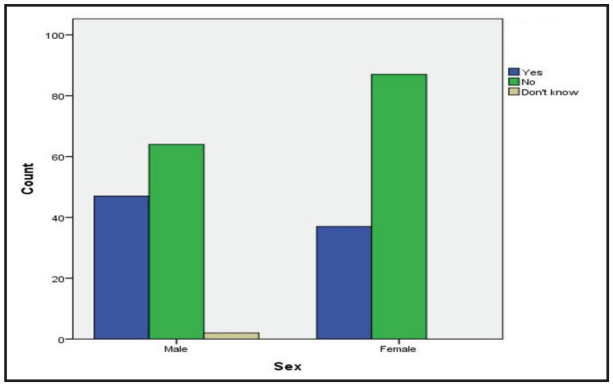


Figure (1) Comparison of the responses between males and females regarding if they had taken orthodontic treatment or not

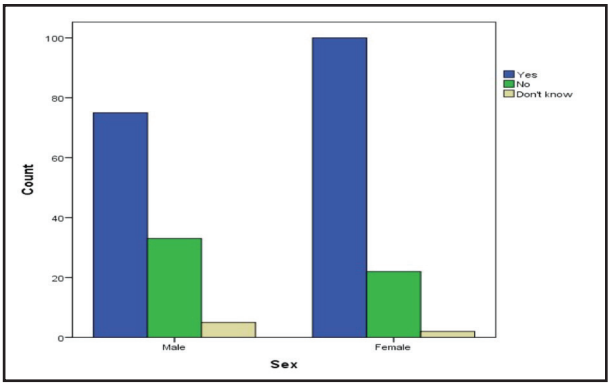


Figure (2): Comparison of the responses between males and females regarding if they had heard of an orthodontist or not

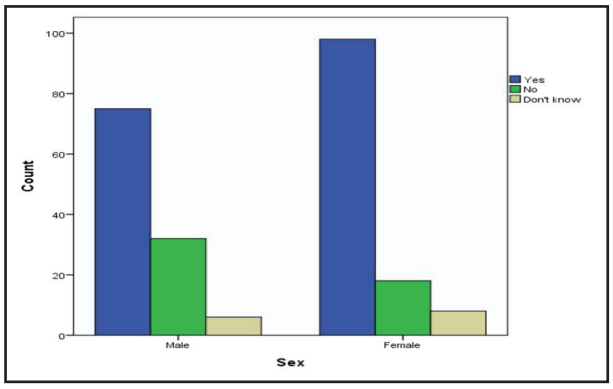


Figure (3) Comparison of the responses between males and females regarding if they had noticed people with braces or not

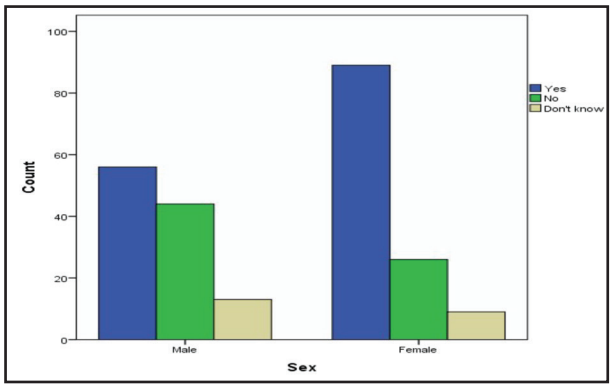


Figure (4) Comparison of the responses between males and females regarding if they were aware that irregular teeth can be aligned or not

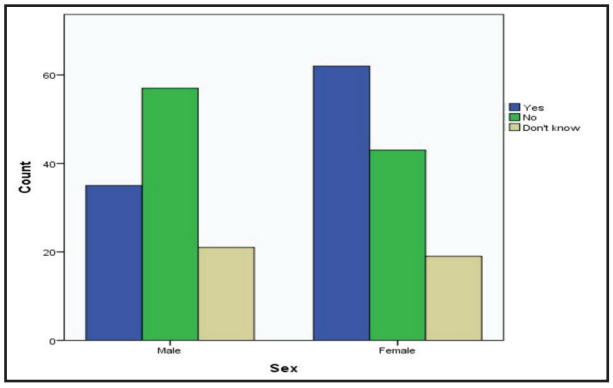


Figure (5) Comparison of the responses between males and females regarding if they were aware that retainers were worn after orthodontic treatment or not

## DISCUSSION

Self-awareness and knowledge of individuals about orthodontics is of great importance and should not be underestimated in order to improve patient's quality of life as well as to achieve successful orthodontic treatment planning and promising results [31,34]. A survey investigating the amount of knowledge and attitude among a sample of Egyptian patients toward different aspects of malocclusion and orthodontic treatment will provide more insight for better planning to improve peoples' well-being in relation to dental and functional health as well as self- esteem [36].

Attitude and perception of facial and dental esthetics vary differently among individuals and populations. Regarding the awareness of orthodontic treatment cost and the longer duration that orthodontic treatment takes (71.7% and 50.6% respectively), many of the participants agreed that orthodontic treatment is costly and takes a long time. This outcome is similar to the results of previous studies [31, 32], which suggest that financial limitation and the long duration of treatment maybe barriers for patients to undergo orthodontic treatment.

Nearly half of the responding participants (42.2%) do not know the ill effects that irregular teeth or oral habits (46%) have on dental health. These results are similar to results found by studies made in other developing countries [24, 28, 30]. This may suggest that there is lack of knowledge and awareness related to this aspect which may contribute to people not seeking orthodontic treatment when necessary.

In this study, in spite that more than half of the respondents did not undertake orthodontic treatment (63.7%) the majority can notice irregular teeth (82.2%), notice people wearing braces (73%) and have heard of an orthodontist (73.8%). This may give an overview that the awareness of the orthodontic specialty is quite appreciable and this is also found to be in accordance to other studies studying the same factors [26, 32, 35].

Regarding the questions related to orthodontic treatment, it is obvious from the results that nearly

half of the participants have no knowledge about the use of retainers (42.2%) after orthodontic treatment, that few teeth maybe removed for orthodontic treatment (40.5%) and that oral habits can be treated by orthodontics (48.9%). These findings are similar to those found by other studies [28, 31, 35], but different from a study that included a sample of nursing students who are found to have more knowledge about orthodontics[32]. This difference in findings may be due to that the nature of studying nursing may provide more knowledge to individuals in relation to the dental field.

Three questions have the highest number of participants answering with 'don't know' answer in comparison to the other asked questions. These questions were the ones considering the social acceptance of participants regarding the appearance of irregular teeth and teeth with braces during marriage proposals (26.6% and 35.4% respectively) as well as if there are any personality changes due to orthodontic treatment (27.8%). These answers may indicate that further investigation is required for proper analysis and evaluating the relation between the severity of malocclusion and these factors may also provide additional knowledge.

When comparing the results between both genders, more females are found to have undergone orthodontic treatment than males. This result may indicate that females are more concerned with their appearances than males, thus, seeking orthodontic treatment. Also, more females heard about orthodontics, more are aware of people having braces, they are also more aware that irregular teeth can be treated by orthodontics and that retainers are used after treatment. These findings may be related to the fact that more females had orthodontic treatment, therefore, they have more knowledge concerning factors related to their experience. These findings are similar to other studies in a performed literature review [29], but different from a study performed in India, where males are found to have more knowledge about orthodontics than females[35]. This difference may be due to differences in the cultures between countries.

## CONCLUSION

On the bases of the results obtained from this study, it was concluded that females were more interested in receiving orthodontic treatment than males, thus noticing individuals with braces and were more aware that irregular teeth can be treated orthodontically than males. Nearly half of the participants from both genders have no knowledge of the ill effects that can be caused from irregular teeth or oral habits and that oral habits can be treated by orthodontics. Therefore, it is important to provide appropriate knowledge for individuals in the aspects that showed little awareness. Whereas questions related to social aspects needed further investigation.

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## CONFLICT OF INTEREST

The author declares no conflict of interest.

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