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PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1252399>Available online at: <http://www.iajps.com>**Research Article****EFFECT OF MALOCCLUSION ON ADULTS' ORTHODONTIC
TREATMENT: A RESEARCH ANALYSIS****¹Dr. Saadat Ullah, ²Dr. Hira Salman, ³Dr. Hamza Zahid**¹Dental Surgeon at Tehsil Head Quarter Hospital, Wazirabad, Gujranwala²House Officer at Lahore Medical & Dental College, Lahore³Registrar at Akhtar Saeed Medical & Dental College, Lahore**Abstract:**

The objective was to examine the Teen Oral Health-related Quality of Life (TOQOL) questionnaire for use in adults receiving orthodontic treatment and assess validity and reliability by age group. For this purpose teenagers from 5 to 18 years and adults 18 and over was selected and completed surveys at LMDC & AMDC Dentistry departments and hospitals. The survey consisted of socio demographic information, dental behavior questions, and the TOQOL instrument. Overall, 50 teens and 50 adults participated. The mean ages were 13 years for the teens and 32 years for the adults. Subjects were represented by both sexes. In general, scores overall and by domains were higher for adults than for teens, signifying a greater effect of the malocclusion on the quality of life. Mean TOQOL scores as well as emotional and social domain scores ($P < 0.001$) were worse in adults than in teens ($P < 0.01$). Construct validity was supported by strong an association of TOQOL scores with self-reported oral health. The Cronbach alpha was higher in adults overall and for all domains. As a result adults who come for orthodontic treatment appear to be more affected by their malocclusion than are teens. The total TOQOL score and the emotional and social domains were significantly higher for adults. The total TOQOL score and the emotional and social domains were significantly higher for adults than teens. This project suggested that TOQOL may be a useful way to measure the impact of malocclusion on the quality of life in both adults and teens.

Key words: TOQOL, teens, adults, Orthodontics, malocclusion.**Corresponding author:****Dr. Saadat Ullah,**Dental Surgeon at Tehsil Head Quarter Hospital,
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INTRODUCTION:

Evidence on the physical, psychological, and social consequences of malocclusion and its associated treatment as they relate to quality of life is still conflicting. Although studies generally report an association between malocclusion/orthodontic treatment need and oral health related quality of life (OHRQoL) scores, the strength of evidence is relatively low, and there is a need for using standardized methods to enhance comparability [1-3].

Patient-centered care is a concept that has been introduced recently in healthcare systems. Among the main elements are a need to understand the patient's treatment needs, experiences, satisfaction and the perceived overall quality of healthcare system¹. With an increasing number of adult patients now seeking orthodontic treatment, there is a growing need for such research in orthodontics. To date, very little work has been published evaluating patient experiences during treatment in relation to the type of appliance being received.

Malocclusion is often conspicuous, so it might lead to adverse social reactions and a deficient self-concept. Correction of the malocclusion has been shown to improve body image of dental and facial features [2]. In addition, because social and psychological effects are the key motives for seeking orthodontic treatment therefore oral health related quality of life (TOQOL) can be considered a useful supplementary measurement for orthodontic treatment need and outcome [3].

In a recent cross-sectional study, Palomares *et al.*¹⁶ compared the TOQOL of young Brazilian adults, aged 18–30 years, who had completed orthodontic treatment to untreated subjects waiting for treatment. Earlier research has predominately focused on the pain and discomfort experiences of patients in relation to labial fixed appliances. These studies have evaluated only the short-term (0–14 days) effects and demonstrate pain commences 2h after placement of the appliance, peaks at 24h, with discomfort dissipating over the next 5–7 days (9–11).

Objective of the study

The main objective of the study was to examine the Teen Oral Health-related Quality of Life (TOQOL) and for this purpose questionnaire analysis was used

for adults receiving orthodontic treatment and assess validity and reliability by age group.

Material and Methods

This study utilized a prospective design, for which ethical approval and written informed consent was obtained, in which adult patients undergoing treatment were observed during the course of treatment. Survey method was used for data collection. The survey consisted of socio demographic information, dental behavior questions, and the TOQOL instrument. Sample size calculation was carried out using data of a study investigating the effects of orthodontic treatment. Teenagers from 5 to 18 years and adults 18 and over completed surveys at LMDC & AMDC Dentistry departments and hospitals.

Socioeconomic status

A validated questionnaire in which demographic data and occupational and educational status of subjects was gathered as an indicator of socioeconomic status was used.

Statistical analysis

Data analysis was performed using the Statistical Package for the Social Science software (SPSS), version 17.0 (New York, USA), using t-test and ANOVA with statistical significance set at $P < 0.05$. A summary of baseline characteristics of participants in the study was performed.

RESULTS:

Among the 100 people who completed the questionnaires, 50 adults (50%) met the inclusion criteria for the present study. The final sample used for analysis was composed of men and women. Overall, 50 teens and 50 adults participated. The mean ages were 13 years for the teens and 32 years for the adults. Subjects were represented by both sexes. In general, scores overall and by domains were higher for adults than for teens, signifying a greater effect of the malocclusion on the quality of life. Mean TOQOL scores as well as emotional and social domain scores ($P < 0.001$) were worse in adults than in teens ($P < 0.01$). Construct validity was supported by strong an association of TOQOL scores with self-reported oral health.

Table 1: Distribution of participants by groups according to malocclusion or orthodontic treatment

	TEENS	ADULTS
Normal occlusion	49.52	50.48
Malocclusion	46.04	53.96
Fixed treatment	39.83	60.17
Retention	41.15	58.85
total	43.95	56.05

Table 2: Pearson's correlation coefficient between OHIP-14 and PIDAQ scores

	OHIP	PIDAQ
OHIP	1	
PIDAQ	0.482***	1

OHIP scores were higher for adults than for teens across groups, with women scoring significantly higher in the normal occlusion and fixed treatment groups. This indicates that women are more affected by oral health than are men, and that they experience lower TOQOL. Women in the malocclusion and fixed treatment groups had significantly higher

PIDAQ scores than did men, indicating that women in these groups were more psychosocially influenced by dental esthetics than were men in the same group. In addition, although men in the normal occlusion group had higher PIDAQ scores than women, this finding was not significant.

Table 3: Results of one-way analyses of variance comparing Psychosocial Impact of Dental Aesthetics Questionnaire scale scores in respondents with differing self-perceived aesthetics in the Perception of Occlusion Scale: means (M), standard deviations (SD), *F*-statistics and level of significance.

Items in brief	Dental self-confidence	Social impact	Psychological impact	Aesthetic concern	α when item deleted
Proud of teeth	0.85	-0.09	-0.13	-0.05	0.89
Like to show teeth	0.82	-0.12	-0.11	-0.22	0.88
Pleased to see teeth in mirror	0.86	-0.06	-0.11	-0.11	0.88
Teeth are attractive	0.80	-0.10	-0.13	-0.06	0.89
Satisfied with appearance	0.71	-0.19	-0.29	-0.23	0.89
Find tooth position nice	0.66	-0.06	-0.35	-0.29	0.90

Items in brief	Dental self-confidence	Social impact	Psychological impact	Aesthetic concern	α when item deleted
Hold back when I smile	-0.16	0.61	0.37	0.29	0.80
What others think	-0.15	0.62	0.33	0.07	0.81
Offensive remarks	-0.14	0.78	0.20	-0.01	0.81
Inhibited in social contacts	-0.05	0.65	0.31	0.19	0.80
Hide my teeth	-0.03	0.63	-0.02	0.30	0.82
People stare	-0.09	0.76	0.09	0.02	0.81
Irritated on remarks	-0.26	0.50	0.17	0.12	0.85
Worry about opposite sex	-0.04	0.62	0.17	0.16	0.82
Envy	-0.24	0.20	0.74	0.18	0.84
Somewhat distressed	-0.11	0.29	0.68	0.04	0.86
Somewhat unhappy	-0.25	0.44	0.61	0.24	0.83
Others have nicer teeth	-0.22	0.32	0.38	0.29	0.86
Feel bad	-0.19	0.39	0.57	0.28	0.83
Wish teeth looked better	-0.28	0.22	0.74	0.32	0.81
Don't like teeth in mirror	-0.24	0.12	0.38	0.72	0.85

Items in brief	Dental self-confidence	Social impact	Psychological impact	Aesthetic concern	α when item deleted
Don't like teeth in photo	-0.25	0.29	0.16	0.82	0.78
Don't like teeth on video	-0.21	0.30	0.22	0.77	0.82
Amount of variance explained (initial solution)	9.27	2.98	1.30	1.04	
Percentage of variance explained (initial solution)	40.42	12.68	5.63	4.54	
Percentage of variance explained (rotated solution)	18.78	18.68	14.53	11.28	
Cronbach's α	0.91	0.86	0.87	0.87	

DISCUSSION:

Many factors affect TOQOL; functional factors such as mastication, speech, and the experience of pain/discomfort, psychological factors concerning appearance and self-esteem, and social interactions are all contributors¹³. The present study sought to identify the relationship between malocclusion and orthodontic treatment and TOQOL in adults. The results showed that people with malocclusion had significantly lower TOQOL, but when orthodontic treatment was completed, TOQOL was increased to levels similar to normal occlusion.

The OHIP and OHIP-14 were originally developed to evaluate TOQOL in the elderly²⁴⁻²⁵. However, both have since been recognized as valid and reliable tools for evaluating TOQOL in young adults and adolescents²⁶⁻²⁷. A TOQOL comparison study using the OHIP-14 reported that age, tooth loss, and

cultural background¹ are important factors that affect quality of life²⁸. The present study limited its sample to subjects aged 18-39 years receiving fixed orthodontic treatment. Subjects were excluded if they had any extracted teeth, except for the purpose of orthodontic treatment. Patients who had undergone corrective orthognathic surgery were also excluded, as results of prior study²² have shown that their experiences differ from the psychological status of typical adult orthodontic patients.

The results of this study showed that OHIP-14 scores are greatly affected by oral health in the malocclusion and fixed treatment groups in comparison with the normal occlusion and retention groups. The malocclusion and fixed treatment groups were also found to have low TOQOL; there was no significant difference between the malocclusion and fixed treatment groups, or between the normal occlusion and retention groups. In the present study, the areas

of the OHIP-14 in which the fixed treatment group had higher scores were the domains of physical pain and physical disability¹⁹. Discomfort and difficulty in taking meals due to orthodontic devices, pain due to tooth shifting, and irritation of the buccal mucosa may have contributed to these results. Additionally, the malocclusion group had a higher score than the fixed treatment group in the other 5 OHIP-14 domains. It is thought that the fixed treatment group had higher TOQOL than the malocclusion group because the anticipation of the end of orthodontic treatment, adaptation to treatment, or learned experiences of treatment may have served as psychologically positive influences²⁰. This is also thought to be the reason why members of the fixed treatment group are less affected psychosocially with regard to dental esthetics in the PIDAQ compared to the malocclusion group (Table 2). Our results are comparable with those of recent studies that used the OHIP-14 or PIDAQ, which found that malocclusion has a negative impact on TOQOL, and that this impact increases with the severity of malocclusion¹⁵⁻¹⁶.

Women may also respond more sensitively to the various forms of discomfort that arise in the oral cavity during orthodontic treatment. PIDAQ score did not differ significantly by gender in the normal occlusion or retention groups, but it could be observed that women in the malocclusion and fixed treatment groups were more affected psychosocially with regard to dental esthetics than were their male counterparts. Rusanen *et al*¹³. investigated patients prior to treatment for severe malocclusion using the OHIP-14, and reported that women were more affected in terms of TOQOL than were men. Bellot-Arcís *et al*¹⁵. also observed that psychological impact increased with the severity of malocclusion, and that this trend was more pronounced in girls. However, Palomares *et al*¹⁵. stated that an OHIP-14 survey of 18-30-year-old Brazilian adults on orthodontic treatment experience found a negligible difference in TOQOL between genders. This lack of gender difference was also found in the study of Gazit-Rappaport *et al.*¹⁷ which measured TOQOL before and after orthodontic treatment using the PIDAQ in adults aged 21-59 years.

The present study also showed that TOQOL was significantly affected by malocclusion and orthodontic treatment. However, Shaw *et al.* reported that improvements in the severity of malocclusion through orthodontic treatment did not lead to significant differences in the psychological status of self-esteem or depressed mood when compared with a group that did not receive orthodontic treatment.

CONCLUSION:

Adults who come for orthodontic treatment appear to be more affected by their malocclusion than are teens. The total TOQOL score and the emotional and social domains were significantly higher for adults. The total TOQOL score and the emotional and social domains were significantly higher for adults than teens. This project suggested that TOQOL may be a useful way to measure the impact of malocclusion on the quality of life in both adults and teens.

Limitations

The present study had some limitations, and further discussion is necessary to promote relevant future research addressing these limitations. First, the study participants were arbitrarily chosen from patients who visited one of nine dental hospitals or clinics. Thus, it is possible that this study does not reflect the characteristics of normal occlusion or malocclusion patients who did not visit those dental clinics.

Contribution of Authors

All the authors contributed equally. Dr. Saadat Ullah conceived of the presented idea and do all the lab work and carried out the experiment with other co-authors. Dr. Hira developed the theory and performed the computations. Dr. Hamza Zahid supervised the findings of this work and developed the theoretical formalism, performed the analytic calculations and performed the numerical simulations. All the authors contributed to the final version of the manuscript

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