

CO-RELATION OF ORTHODONTIC TREATMENT NEEDS & ORAL HEALTH RELATED QUALITY OF LIFE IN YOUNG ADULTS- A CROSS SECTIONAL STUDY

Akash Jain Potdar¹, Manish Goyal², Mukesh Kumar³, Saksham Madhok⁴, Sumit Kumar⁵, Sonam Rastogi⁶

Post graduate student¹, Principal & Head², Professor³, Senior lecturer^{4,5,6}

Department of Orthodontics and Dentofacial Orthopaedics, Teerthanker Mahaveer Dental College and Research Centre, Delhi road, Moradabad, Uttar Pradesh

Abstract

Our objective was to assess and co-relate the amount of association between oral health related quality of life (OHRQOL) & orthodontic treatment needs of young adult patients. In previous couple of decades, most patients have expressed their desire to have esthetic smile and good orthodontic treatment. Hence OHRQOL plays an important role because it is a tool through which we come to know the impact related to malocclusion over patient's life.

Method: Present study was conducted on 350 patients (age range – 17 to 28 years) consisted of interview and oral clinical examination. Examination have been conducted on pre orthodontic treatment patients, who visited department for the correction of their malocclusion. In this study need of orthodontic treatment was evaluated based on dental health component (DHC) of index of orthodontic treatment need (IOTN) and OHRQOL by oral health impact profile (OHIP – 14) questionnaire.

Results: Statistically significant association have been obtained among OHIP-14 scores of patients with IOTN ($P < 0.05$). The magnitude of co-relation of IOTN was moderate to strong in relation to various OHIP questionnaire's responses.

Conclusions: Thus, it was found that malocclusion causes considerable adverse effects on OHRQOL. Moreover, OHIP can serve as important tool for providing important information of patient's needs of treatment and for achieving utmost patient as an contentment.

Key words: Malocclusion; Orthodontic treatment need; Quality of life, Oral health related quality of life, Index of orthodontic treatment need, Dental health component.

Introduction

Malocclusion is one of the most widely recognized dental issue and its prevalence is high in many nations. It is believed to be associated with large number of hereditary as well as environmental causes, also it is acknowledged to be increasingly present in current time than ancient.¹ In the previous couple of decades, most patients have expressed their desire for an esthetic smile and good orthodontic treatment. As the physical, social and mental impacts been main motivation behind why orthodontic consideration is looked for, it tends to be concluded that the finest proportion of results by orthodontic treatment remains enhancement in physical, social and mental well being. The physical, social and mental parts of oral health covers what has been referred to as *oral-well being associated personal satisfaction*, and this gives us an understanding about how person's oral well being status impacts quality of life (QOL).²

It has been noticed that patients are more concerned for orthodontic treatment if they have crooked or proclined teeth. Patients generally do not visit orthodontic clinic if they have deep bite or periodontal problems secondary to malocclusion.^{1,3} The general perception of malocclusion among people across the globe changes from country to country.⁴ Patients belonging to higher socio economic groups take orthodontic treatment and dental esthetics more seriously as compared to patients belonging to lower socio economic groups.⁵ If the results of orthodontic treatment are good and also there is a long term follow up then there are significant changes in quality of life of patient.⁶ It has been observed by numerous researchers

that whenever questionnaire studies have been conducted the score given by the examiner is generally more than what the patient gives to themselves.⁷

For the enhancement of the oral health as well as the psychosocial improvement, the orthodontic treatment plays a very important role. Hence OHRQOL has a vital role because it is a tool through which we come to know the effects of malocclusion on the patient's life.⁸

Among the various indices, 'IOTN' is most appropriate index for scoring of malocclusion. Brook and Shaw developed IOTN in 1989, as a scoring scheme pertaining to malocclusion. This method consist of independent component namely DHC a grade 5 index which helps to record dental health and requirements of the orthodontic treatment.⁹

Most frequent method of identifying dimensions in OHRQOL is OHIP-14. It reflects how oral disorders have an impact on the well being of general people.¹⁰

A.J. Spencer and G.D. Slade introduced OHIP in year 1994, then later on in year 1997 G.D. Slade used abbreviation 'OHIP – 14', to shorten the term Oral Health Impact Profile. Questions asked whether patient had very often, fairly often, occasionally, hardly ever, or never experienced any of the problems evaluated using the 14-variables of OHIP in past 1 year.¹¹

Numerous studies have been conducted on the effect of the malocclusion on the physical and psychological parameters.¹² Studies on the calculation of the malocclusion by IOTN have been conducted but the co-relative analysis between 14 questions of OHIP-14 questionnaire and 5 grades of IOTN have not been conducted in the past. It was the study to find

out the co-relation between orthodontic treatment needs and OHRQOL.

Materials and Methods

This study was the cross sectional study which was done to evaluate and co-relate treatment needs and OHRQOL in young adults. This study was conducted on 350 patients consisted of interview and clinical oral examination. Patients were selected from the Department of Orthodontics and Dentofacial Orthopedics of Teerthanker Mahaveer University.

Inclusion criteria:

- Young adults from age group between 17 to 28 years old.
- Pre-treatment orthodontic patients.

Exclusion criteria:

- Patients who were undergoing or have already undergone orthodontic treatment.
- Patients with chronic medical condition.
- Patients having craniofacial anomalies like cleft lip and palate.

Ethical clearance for the study was obtained prior to commencement of the study from the ethical clearance committee of our University. A detailed informed written consent forms were obtained from each patient or guardians. Questionnaire form of OHIP-14 for obtaining necessary before commencement of study as well as significant data from each of the 350 patients were used along with form of DHC of IOTN.

The patients were asked to comfortably sit on dental chair with back rest, with the examiner standing beside the chair. Type III examination (consists of inspection, using mouth mirror, probe and explorer along with adequate illumination) was done. Overjet was measured using metallic scale and marker. The clinical examination for each case was done by 3 different clinicians conducted independently. The final IOTN score considered was the maximum value of three scores given by the three clinicians towards the more severe trait. All patients were evaluated for need of orthodontic treatment using DHC of the IOTN. (Refer Table - i). Need of the treatment for various subjects was classified as follows:

- (1) Little or no treatment need,
- (2) Borderline need (Moderate), and
- (3) Treatment required (Great, very great).

DHC includes crossbite, contact points displacements, overjet, deepbite, missing teeth, etc. and recognition of most rigorous occlusal trait for each patient was done. The concluding final score been allotted to the patient was as per the most severe trait.

OHRQOL was assessed by OHIP-14 questionnaire. The questionnaire included a set of 14 questions which were related to OHRQOL. (Refer Table - ii)

Statistical Analysis

Collected data was entered into Microsoft Excel® 2018. SPSS® 22.0 (Chicago, U.S.A.) software was used for statistical analysis and presentation of data. Descriptive

statistics were calculated for collected data. To analyse the qualitative data chi-square test was performed. Spearman co-relation coefficient was calculated to find co-relation between IOTN and quality of life. Considered significance level was ≤ 0.05 .

Results

Overall result was indicative of significant co-relation which has been shown in tabular form :

Table iii showing over all evaluation of IOTN as per examination made on all 350 patients. From the table it can be concluded that maximum number of sample patients were observed under Grade 3 which is 'moderate' category which was 44.6 % and minimum 8.0 % of sample patients were observed falling under Grade 1 (Grade 1 –None, Grade 2 – Little, Grade 3 – Moderate, Grade 4 –Great and Grade 5 – Very Great).

Table iv showing evaluation of all OHIP – 14 questionnaire responses obtained from 350 patients as per each of the 6 options of each of the 14 questions of OHIP. These six options were 'don't know', 'never', 'hardly ever', 'occasionally', 'often' and 'very often'. In all of questions from Q.1 to Q.14 of OHIP-14 questionnaire, majority of the responses recorded were for 'occasionally' the option. In question number 3 of OHIP, maximum 41.1% of the subjects marked 'occasionally' and in question number 2 of OHIP, minimum 4.3% of the subjects marked 'Don't know' option on the questionnaire.

Table v showing co-relation between 1 to 14 questions of OHIP-14 scores with 5 grades of IOTN of 350 patients; where 'P' is denoting Probability and level of significance is $< \text{ or } = 0.05$. Most of the participant's response was 'often' & 'very often'. Strong correlation coefficient was observed.

Dental Health Component (DHC) Of Index of Orthodontic Treatment Need (IOTN)

5 (Very Great)

- 5.a Impeded eruption of teeth (apart from 3rd molars) due to crowding, displacement, the presence of supernumerary teeth, retained deciduous teeth, and any pathological cause
- 5.b Extensive hypodontia with restorative implications (more than one tooth missing in any quadrant requiring pre-restorative orthodontics)
- 5.c Increased overjet > 9 mm
- 5.d Reverse overjet > 3.5 mm with reported masticatory and difficulties
- 5.e Defects of cleft lip and palate
- 5.f Submerged deciduous teeth

4 (Great)

- 4.a Increased overjet > 6mm but ≤ 9 mm
- 4.b Reverse overjet > 3.5 mm with no masticatory or speech difficulties
- 4.c Anterior or posterior crossbites with > 2 mm discrepancy between the retruded contact position and intercuspal position
- 4.d Severe displacements of teeth > 4
- 4.e Extreme lateral or anterior open bites > 4 mm
- 4.f Increased and complete overbite with gingival or palatal trauma
- 4.g Less extensive hypodontia requiring pre-restorative orthodontics or orthodontic space closure to obviate the need for a prosthesis
- 4.h Posterior lingual crossbite with no functional occlusal contact in one or more buccal segments

4.i Reverse overjet > 1 mm but < 3.5 mm with recorded masticatory and speech difficulties
4.j Partially erupted teeth, tipped and impacted against adjacent teeth
4.k Existing supernumerary teeth
3 (Moderate)
3.a Increased overjet > 3.5 mm but <= 6 mm (incompetent lips)
3.b Reverse overjet greater than 1 mm but <= 3.5mm
3.c Anterior or posterior crossbites with >1mm but <= 2mm discrepancy between the retruded contact position and intercuspal position
3.d Displacement of teeth >2mm but <=4mm
3.e Lateral or anterior open bite > 2mm but <= 4mm
3.f Increased and incomplete overbite without gingival or palatal trauma
2 (Little)
2.a Increased Overjet > 3.5 mm but <= 6 mm (with competent lips)
2.b Reverse overjet greater than 0 mm but <= 1mm
2.c Anterior or posterior crossbite with <= 1mm discrepancy between retruded contact position and intercuspal position
2.d Displacement of teeth > 1mm but <= 2mm
2.e Anterior or posterior open bite > 1mm but <= 2mm
2.f Increased overbite >= 3.5mm (without gingival contact)
2.g Pre normal or post normal occlusions with no other anomalies. Includes up to half a unit discrepancy
1 (None)
Extremely minor malocclusions, including displacements less than 1 mm

Final overall score given to the patient according to most severe trait is _____

Sign of Patient –

Sign of doctor –

Table – i : Questionnaire form for recording DHC of IOTN

Oral Health Impact profile (OHIP -14)

Oral Health Impact Profile (OHIP-14/Slade 1997) *Oral Health-Related Quality of Life Measure*
ORAL HEALTH IMPACT PROFILE

Name - _____
 OPD No. _____
 Age/Sex _____

Date _____
 MobileNo. _____

HOW OFTEN have you had the problem during the last year?(Tick your answer)

1. Have you had <u>trouble pronouncing any words</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
2. Have you felt that your <u>sense of taste has worsened</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW

3. Have you had <u>painful aching</u> in your mouth?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
4. Have you found it <u>uncomfortable to eat any foods</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
5. Have you been <u>self-conscious</u> because of your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
6. Have you <u>felt tense</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
7. Has your <u>diet been unsatisfactory</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
8. Have you had to <u>interrupt meals</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
9. Have you found it <u>difficult to relax</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
10. Have you been a bit <u>embarrassed</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
11. Have you been a bit <u>irritable with other people</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
12. Have you had <u>difficulty doing your usual jobs</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
13. Have you felt that life in general was <u>less satisfying</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW
14. Have you been <u>totally unable to function</u> because of problems with your teeth, mouth or dentures?	VERY OFTEN	FAIRLY OFTEN	OCCASIONALLY	HARDLY EVER	NEVER	DON'T KNOW

Table - ii : OHIP - 14 Questionnaire form

IOTN Grades		N (No. of patients)	Percentage (%)
Grade 1		28	8.0%
Grade 2		31	8.9%
Grade 3		156	44.6%
Grade 4		72	20.6%
Grade 5		63	18.0%
TOTAL		350	

Table - iii

Over all evaluation of IOTN as per examination done on 350 patients.

OHIP - 14 Questionnaire's responses		N	%
Q1 of OHIP-14	Don't Know	32	9.10%
	Never	27	7.70%
	Hardly ever	27	7.70%
	Occasionally	134	38.30%
	Often	74	21.10%
	Very often	56	16.00%
Q2 of OHIP-14	Don't Know	15	4.30%
	Never	43	12.30%
	Hardly ever	24	6.90%
	Occasionally	134	38.30%
	Often	73	20.90%
	Very often	61	17.40%
Q3 of OHIP-14	Don't Know	24	6.90%
	Never	26	7.40%
	Hardly ever	24	6.90%
	Occasionally	144	41.10%
	Often	90	25.70%
	Very often	42	12.00%
Q4 of OHIP-14	Don't Know	20	5.70%
	Never	26	7.40%
	Hardly ever	37	10.60%
	Occasionally	137	39.10%
	Often	74	21.10%

Q5 of OHIP-14	Very often	56	16.00%
	Don't Know	20	5.70%
	Never	40	11.40%
	Hardly ever	25	7.10%
	Occasionally	130	37.10%
	Often	87	24.90%
Q6 of OHIP-14	Very often	48	13.70%
	Don't Know	16	4.60%
	Never	28	8.00%
	Hardly ever	41	11.70%
	Occasionally	138	39.40%
	Often	77	22.00%
Q7 of OHIP-14	Very often	50	14.30%
	Don't Know	25	7.10%
	Never	34	9.70%
	Hardly ever	28	8.00%
	Occasionally	132	37.70%
	Often	31	8.90%
Q8 of OHIP-14	Very often	100	28.60%
	Don't Know	27	7.70%
	Never	17	4.90%
	Hardly ever	37	10.60%
	Occasionally	138	39.40%
	Often	72	20.60%
Q9 of OHIP-14	Very often	59	16.90%
	Don't Know	24	6.90%
	Never	23	6.60%
	Hardly ever	40	11.40%
	Occasionally	132	37.70%
	Often	74	21.10%
Q10 of OHIP-14	Very often	57	16.30%
	Don't Know	23	6.60%
	Never	47	13.40%
	Hardly ever	17	4.90%
	Occasionally	130	37.10%
	Often	86	24.60%
	Very often	47	13.40%

Q11 of OHIP-14	Don't Know	23	6.60%
	Never	42	12.00%
	Hardly ever	21	6.00%
	Occasionally	133	38.00%
	Often	84	24.00%
	Very often	47	13.40%
Q12 of OHIP-14	Don't know	36	10.30%
	Never	31	8.90%
	Hardly ever	19	5.40%
	Occasionally	132	37.70%
	Often	55	15.70%
	Very often	77	22.00%
Q13 of OHIP-14	Don't Know	21	6.00%
	Never	45	12.90%
	Hardly ever	22	6.30%
	Occasionally	129	36.90%
	Often	77	22.00%
	Very often	56	16.00%
Q14 of OHIP-14	Don't Know	17	4.90%
	Never	29	8.30%
	Hardly ever	36	10.30%
	Occasionally	134	38.30%
	Often	92	26.30%
	Very often	42	12.00%

Table – iv

Evaluation of all OHIP – 14 questionnaire responses obtained from 350 patients as per each of the 6 options of each of the 14 questions of OHIP (where 'N' is number of patients responded out of 350 for each of the 14 question).

OHIP-14 and IOTN Co-relation

v (a) Q1 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never	48	34	11	93	247.9	0.001	0.68

Occasionally	9	100	18	127			
Often & very often	2	22	106	130			
TOTAL	59	156	135	350			
v (b) Q2 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never	54	20	8	82	367.8	0.001	0.76
Occasionally	3	118	13	134			
Often & very often	2	18	114	134			
TOTAL	59	156	135	350			
v (c) Q3 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never	43	23	8	74	260.5	0.001	0.7
Occasionally	14	111	19	144			
Often & very often	2	22	108	132			
TOTAL	59	156	135	350			
v (d) Q4 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never	46	29	8	83	240.8	0.001	0.68
Occasionally	11	103	23	137			
Often & very often	2	24	104	130			
TOTAL	59	156	135	350			

v (e) Q5 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never					269.3	0.001	0.711
Occasionally	47	31	7	85			
Often & very often	10	103	17	130			
	2	22	111	135			
TOTAL	59	156	135	350			
v (f) Q6 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never					277.8	0.001	0.695
Occasionally	49	26	10	85			
Often & very often	8	110	20	138			
	2	20	105	127			
TOTAL	59	156	135	350			
v (g) Q7 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never					244.2	0.001	0.677
Occasionally	48	30	9	87			
Often & very often	9	101	22	132			
	2	25	104	131			
TOTAL	59	156	135	350			
v (h) Q8	IOTN			TOT	Ch	P-	Correla

of OHIP-14	Grade 1 & 2	Grade 3	Grade 4 & 5	AL	Chi sq.	P-value	Correlation coefficient
	Don't know, hardly ever & never	47	24	10			
Occasionally	10	110	18	138			
Often & very often	2	22	107	131			
TOTAL	59	156	135	350			
v (i) Q9 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never					268.7	0.001	0.702
Occasionally	48	30	9	87			
Often & very often	9	105	18	132			
	2	21	108	131			
TOTAL	59	156	135	350			

v (j) Q10 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never					240.23	0.001	0.664
Occasionally	47	29	11	87			
Often & very often	10	101	19	130			
	2	26	105	133			
TOTAL	59	156	135	350			
v (k) Q11 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				

Don't know, hardly ever & never	49	29	8	86	271.17	0.001	0.706
Occasionally	8	105	20	133			
Often & very often	2	22	107	131			
TOTAL	59	156	135	350			
v (l) Q12 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never	47	29	10	86	262.38	0.001	0.691
Occasionally	10	105	17	132			
Often & very often	2	22	108	132			
TOTAL	59	59	135	135			
v (m) Q13 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never	48	32	8	88	262.4	0.001	0.712
Occasionally	10	101	18	129			
Often & very often	1	23	109	133			
TOTAL	59	156	135	350			
v (n) Q14 of OHIP-14	IOTN			TOTAL	Chi sq.	P-value	Correlation coefficient
	Grade 1 & 2	Grade 3	Grade 4 & 5				
Don't know, hardly ever & never	48	29	8	85	275.54	0.001	0.713
Occasionally	9	105	17	131			
Often & very often	2	22	110	134			

TOTAL	59	156	135	350			
--------------	----	-----	-----	-----	--	--	--

Table - v Co-relation between 1 to 14 questions of OHIP-14 of patients with 5 grades of IOTN

Discussion

The research and surveys conducted by Hunt et al. suggested that the 'General Dental Practitioners' (GDP) possessed a strong influence on the decisions of parents and the patients to undergo or not to undergo orthodontic treatment. This research was confirmed and upheld by numerous studies conducted by Dorsey and Korabick, 1977; Shaw et al., 1979; Gosney, 1986; Lervik and Haugejorden, 1988; Salonen et al., 1992; Pietilä and Pietilä, 1994; Richmond et al., 1994. Shaw et al. posed light on the fact that the GDPs carried with them many strong implicit messages that, the treatment postponed were both necessary and worthwhile. Therefore, it was important that the GDPs along with the orthodontists knew and had a clear understanding of the issues of health gain.¹ These findings were positively resembling to our study in various ways.

In some areas, like that of Saudi Arabia, OHIP's Arabic version was released by Hassan et al by taking a convenience sample of Arabic people. This was done to confirm the reliability, responsiveness and high internal consistency of OHIP. Here, the research was confined to the young adult as the adolescent orthodontic patients underwent major life changes which affected the quality of life. The results revealed that the need of treatment did not significantly affected verbal communication and word pronunciation. Whereas, taste, chewing ability, diet selection, and meal interruption were disrupted.² This cross-sectional study confirmed that to individuals having normal occlusion with malocclusion had less masticatory efficiency in comparison to normal occlusion. In the study of Feu et al they found that on considering both the orthodontic and comparison groups no sex differences been observed. This collaborated the study of Birkeland et al, Hunt et al and Bernabe et al. When the groups were analysed alone, OHIP-14 scores was found higher in girls. So, it was seen that individual personality traits probably had an influence on OHRQOL making negative impacts which did not always depended on the severity of malocclusion.¹³ However in our study we have not taken gender as our criteria.

Espeland et al conducted investigations on the individuals who have already received orthodontic treatments from their university clinics. Their study showed and implied that young adults are always more aware of their malocclusion.¹⁴ In our study also young adults were found to be more aware about their aesthetics and smile. Albino et al in their study suggested that the role of attractiveness in the formation of self-esteem need to be re-evaluated and refrained. Self-esteem in adolescent years is more related with interpersonal performance than the dento-facial esthetics or even physical attractiveness.¹⁵ Whereas, the researchers in this study while examining question number 5 of OHIP – 14 have found that

maximum number of patients were conscious about their looks which was directly related to their self – esteem.

In a study conducted by Seehra et al, the authors found that the prevalence of bullying was reduced in those who have undergone orthodontic treatment. There was a significant relation found between bullying and age which pointed that younger individuals were more prone to bullying than their older peers.¹⁶ In this study also the researchers while examining question number 10 of OHIP – 14 concluded that the young adults were embarrassed socially because of their malocclusion problem. Barbosa et al designed a study as a preliminary evaluation for determination of the associations between masticatory performance (MP) parameters and OHRQOL in 8- to 12-year-old children. According to their study, the results generated by the various analysis supported the fact that a larger number of dental caries secondary to malocclusion could be associated with pain, which may affect physical functioning, emotional status and behaviour and result in limitations in physical activities, schoolwork and activities with friends.¹⁷ In our study the researchers after examining question number 3 and 4 of OHIP – 14 concluded that there were considerable number of young adults who had painful aching in their mouth and felt uncomfortable to eat any food because of their malocclusion. So the result of our study matches the results obtained by Barbosa et al.

In study conducted by Feu et al, they used 2 control groups namely WG (waiting to undergo treatment) and SG (undergone treatment) to see behavioral influences among them. They found that children belonging to SG group had a very cheerful behavior and were more satisfied with their life. On the contrary children of WG group were less satisfied with their life and often felt embarrassed because of their teeth.¹⁸ Researchers in this study while examining question number 10 and 13 concluded that majority of the subjects also felt life in general is less satisfying because of the malocclusion of teeth. The studies conducted by Nazir et al revealed that psychosocial deprivation and esthetic concerns were found more in subjects with less attractive dentition.^{19,20} Researchers while conducting this study carefully examined question number 5 and question number 11 and found that the subjects become very often irritable with other people because of the lack of self confidence secondary to malocclusion.

Brook et al in their survey showed that the common traits making disagreement in the treatment were crowding, increased overjet, crossbites and overbites. All of these posed a problem in accurate recording when the patient was in mixed dentition. Hence, they presented that further refinement of the index in mixed dentition may lead to improvement in reproducibility.⁹ The authors also felt that questionnaire of both OHIP -14 and IOTN, should be revised, so that it can be applied to school going children and adults, as these days adults of around 35 - 45 years are also actively seeking orthodontic intervention.

Conclusion

Modern society is more concerned about their looks. Younger generation has more progressive outlook. The correction of malocclusion is not the only goal of the patients now a days but patients are very much concerned about their looks and

presentability in public life. The obtained results revealed the co-relation between malocclusion and OHRQOL of young adults. Before commencing orthodontic treatment we should consider what all expectations patients have from post treatment results. The obtained results bring to light the effect of malocclusion on oral health related quality of life of patients and accentuate the significance of evaluation based on patient's oral health needs. The results of orthodontic treatment clearly reduced the negative oral health impacts amongst young adults. However, orthodontic treatment may have negative impacts on QOL during the course of treatment.

In this study all the parameters of OHIP-14 and IOTN are showing a significant co-relation. From this study we have reached to the conclusion that we should always take into consideration the patient's views while developing our own treatment plan for them, rather than forcing our views on patient. Also we should evaluate the impact of orthodontic treatment on patient's life.

References

- 1) Orlagh Hunt, Peter Hepper, Chris Johnston, Mike Stevenson and Donald Burden. Professional perceptions of the benefits of orthodontic treatment. *European Journal of Orthodontics* 23 (2001) 315–323.
- 2) Ali H. Hassana and Hatem El-Sayed Amin. Association of orthodontic treatment needs and oral health-related quality of life in young adults. *Am J Orthod Dentofacial Orthop* 2010;137: 42-47.
- 3) Mourad Souames , Francis Bassigny, Nil Zenati, Paul J. Riordan and Marie Laure Boy-Lefevre. Orthodontic treatment need in French schoolchildren: an epidemiological study using the Index of Orthodontic Treatment Need. *European Journal of Orthodontics* 28 (2006) 605–609.
- 4) Eduardo Bernabe, Carlos Flores-Mir; Orthodontic Treatment Need in Peruvian Young Adults Evaluated Through Dental Aesthetic Index; *Angle Orthod* 2006; 76:417–421.
- 5) Rupinder Bhatia, J Jasmin Winnier, Niral Mehta; Impact of malocclusion on oral health-related quality of life in 10–14-years old children of Mumbai, India; 2016 *contempclindent*;7:445-450.
- 6) Nathalia B. Palomares, Roger Keller Celeste, Branca Heloisa de Oliveira, and Jos Augusto M. Miguel; How does orthodontic treatment affect young adults' oral health-related quality of life?; *Am J Orthod Dentofacial Orthop* 2012; 141:751-758.
- 7) I. G. Chestnutt, D. J. Burden, J. G. Steele, N. B. Pitts, N. M. Nuttall and A. J. Morris; The orthodontic condition of children in the United Kingdom, 2003; *British Dental Journal* 2006; 200: 609–612.
- 8) P Finbarr Allen; Assessment of oral health related quality of life; *Health and Quality of Life Outcomes* 2003, 1:40
- 9) Peter H. Brook and William C. Shaw. The development of an index of orthodontic treatment priority. *European Journal of Orthodontics* 11 (1989) 309-320.

- 10) Zhijian Liua; Colman McGrath; Urban Hagg. The Impact of Malocclusion/Orthodontic Treatment Need on the Quality of Life. *Angle Orthod.*2009; 79:585–591.
- 11) Slade, G.D. and Spencer, A.J. (1994) Development and Evaluation of the Oral Health Impact Profile. *Community Dental Health*, 11, 3-1
- 12) Mourad Souames , Francis Bassigny, Nil Zenati, Paul J. Riordan and Marie Laure Boy-Lefevre. Orthodontic treatment need in French schoolchildren: an epidemiological study using the Index of Orthodontic Treatment Need. *European Journal of Orthodontics* 28 (2006) 605–609.
- 13) Daniela Feu, Branca Heloisa de Oliveira, Marco Antonio de Oliveira Almeida, H. Asuman Kiyak, dand Jose´ Augusto M. Miguel. Oral health-related quality of life and orthodontic treatment seeking. *Am J Orthod Dentofacial Orthop* 2010;138:152-159.
- 14) Lisen V. Espeland and Arild Stenvik, Orthodontically treated young adults: awareness of their own dental arrangement, *European Journal of Orthodontics* 13 (1991) 7-14.
- 15) Judith E.N. Albino, Sandra D. Lawrence, Lisa A Tedesco, Psychological and Social effects of Orthodontic treatment, *Journal of Behavioral medicine* Vol 17, No.1, 1994; 81 – 98.
- 16) Jadbinder Seehra, Padhraig S. Fleming, Tim Newton and Andrew T. Di Biase; Bullying in orthodontic patients and its relationship to malocclusion, self esteem and oral health-related quality of life; *Journal of Orthodontics*, Vol. 38, 2011, 247–256.
- 17) Tais de Souza Barbosa, Maria Claudia de Morais Tureli, Marines, Nobre-dos-Santos, Regina Maria Puppini-Rontani, Maria Beatriz Duarte Gavia; The relationship between oral conditions, masticatory performance and oral health-related quality of life in children; *archives of oral biology* (2013) AOB-2954; 1-8.
- 18) Daniela Feu; Jose Augusto M. Miguel; Roger K. Celeste; Branca Heloisa Oliveira; Effect of orthodontic treatment on oral health–related quality of life; *Angle Orthod.* 2013; 83:892–898.
- 19) Rozina Nazir, Amjad Mahmood, Ayesha Anwar; assessment of psychosocial impact of dental aesthetics and self perceived orthodontic treatment need in young adults; *Pakistan Oral & Dental Journal* Vol 34, No. 2 (June 2014); 312 - 316.
- 20) Dikson Claudino and Jefferson Traebert; Malocclusion, dental aesthetic self-perception and quality of life in a 18 to 21 year-old population: a cross section study; Claudino and Traebert *BMC Oral Health* 2013, 13:3.

Corresponding Author

Dr. Mukesh Kumar
 Professor,
 Department of Orthodontics and Dentofacial
 Orthopaedics TMDRC,
 Moradabad
 Email: drmukeshortho@yahoo.co.in