

Orthodontic Treatment Need and its Psychosocial Impact among Students from Technological University, Kyaukse

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Abstract

Malocclusion is one of the oral conditions which may handicap to functional needs and interfere with daily life of an individual. The main benefit of orthodontic treatment may be improvement in aesthetics and psychosocial well-being. The aim of this study was to assess orthodontic treatment need and its psychosocial impact among students from Technological University, Kyaukse.

A total of 277 university students (122 males and 155 females) participated in this cross-sectional descriptive study. Data concerning sociodemographic characteristics, malocclusion traits measured by IOTN-DHC index and malocclusion-related quality of life assessed by PIDAQ were determined.

Mean age of the participants was 18.76 ± 2.31 years ranging from 16 to 30 years. Majority of participants (63.9%) had experience of dental visit. Concerning orthodontic treatment need grading, majority of the students (45.9%) was Grade 1 followed by Grade 2 (22.9%). In relating to psychosocial impact, mean PIDAQ total scores were 32.91 ± 13.03 in males and 30.66 ± 14.38 in females. IOTN-DHC (5 grades) was categorized into three groups and bivariate analysis with PIDAQ score was done. Significant difference of total PIDAQ score was found in male group ($p=0.015$). Relating to subscale of PIDAQ scores (4 subscales), Social Impact (SI) and Psychological Impact (PI) were statistically significant different among three groups of IOTN-DHC in total sample. Furthermore, there was significant but weak positive correlation ($\rho=0.243$, $p=0.007$) between IOTN-DHC grades and PIDAQ scores in male group. According to IOTN-DHC, although nearly one-fifth of the participants need some form of orthodontic treatment clinically, total psychological impact score was low in this study. The information from the present study may provide baseline data for oral health promotion programs particularly regarding orthodontic treatment need in university students.

Keywords: malocclusion, aesthetics, psychosocial, impact, university students

Introduction

Epidemiology of malocclusion and assessment of orthodontic treatment needs are of national importance in many

countries and therefore these are usually included in many national level surveys. According to WHO, the main oral diseases should be subjected to periodic epidemiologic surveys. Malocclusion,

being described as any deviation from the normal relation of the teeth in the same arch to each other and to the teeth in the opposite arch, represents the third highest prevalence among oral pathologies, secondarily to dental caries and periodontal disease and therefore ranks third among worldwide public health dental disease priorities [1].

Malocclusion affects function and aesthetics and it also has important social, psychological and financial repercussions [2]. A healthy and well-functioning dentition is important during all stages of life since it supports essential human functions and teeth help to give the face its individual shape and form [3]. Although some people seek orthodontic treatment to improve their oral functional ability, most of the patients seek treatment because of their desire to look attractive and to improve their self-esteem [4].

There are numerous indices to determine the need for orthodontic treatment in the patients with malocclusion such as Dental Aesthetic Index, Occlusal Index and Eisman Index, and so on [5]. One of the most widely used objective measurements of orthodontic treatment needs and outcomes is the Index of Orthodontic Treatment Need (IOTN). It is a valid index of orthodontic treatment priority, which can classify the anatomical and aesthetic aspects [6]. IOTN consists of two independent components to record the priorities and need for orthodontic treatment; the first (dental health component - DHC) determines the need for treatment based on dental health and its functional aspects and the second (Aesthetic component - AC) is used to make a judgment about treatment based on examiner's or the individual's opinion [5]. There are various studies to determine the need for orthodontic treatment by using IOTN among Chinese, Nepalese, Sudanese, Iranian and Indian population [4, 5, 6].

Health related quality of life indicates the individual's perception or assessment of the impact of disease or conditions on their daily functioning, well-being or overall quality of life. Poor oral health related quality of life (OHRQoL) is indicative of the expressed negative impact of oral conditions on the multidimensional attributes of the person's life [7, 8]. Recently, growing recognition of the importance of subjective perception of the patients in addition to objective aspects of individual health defined by professionals, has led to conduct a number of studies assessing OHRQoL. Many investigators have become more interested in psychological scale and have focused on the patients' perception of body image during orthodontic treatment planning. Questionnaire is the most commonly used measurement tool of OHRQoL [9] and Klages et al. (2006) designed a new questionnaire, which is a specialized measure for evaluation of orthodontic-related quality of life, named Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) [10].

In Myanmar, there were some studies assessing the condition of malocclusion. The first study was carried out by Thein [11] among 100 patients seeking dental treatment for various reasons at the Institute of Dental Medicine, Yangon. It was the initial study exploring prevalence of malocclusion and need and demand for orthodontic treatment using Dental Aesthetic Index. It was revealed that 86% of the patients had at least one of the recorded malocclusion traits. Angle's class I type of occlusion was the most common type and Angle's class II division 2 type was the least common one. Another study was identified not only severity of malocclusion using IOTN but also perception of personal dental appearance among 100 dental students attending the University of Dental Medicine, Yangon [12]. Recently, Hlaing et al. conducted a cross-sectional study in 2017 to assess

malocclusion and its impact on oral health related quality of life among 190 Grade X students by using Dental Aesthetic Index (DAI) and Child Perception Questionnaire Short Form (CPQ11-14 SF) [13].

Hence, there was only little information concerning malocclusion severity and its psychological impact among adolescence. Consequently, the present study was carried out among university students in Kyaukse Township, Mandalay Region to assess malocclusion status and its psychological impact.

Materials and Methods

This study was a cross-sectional descriptive study and was conducted among 277 students attending Technological University, Kyaukse. Stratified random sampling method was used. The study included the participants having natural dentition without dental bridges or other dental prostheses. Those having previous history of orthodontic treatment or currently undergoing orthodontic treatment were excluded.

Firstly, the rector from Technological University, Kyaukse was contacted and asked for permission. After getting the permission, participants were recruited with the help of teachers. Informed consent form was sent two days prior to examination date. After getting consent, data concerning sociodemographic profile and self-perceived psychosocial impacts of malocclusion (by using PIDAQ Questionnaire) were collected through a face to face interview. PIDAQ Questionnaire composed of 23 questions of four subscales: dental self-confidence (six items), social impact (eight items), psychological impact (six items), and aesthetic concern (three items).

Then, clinical data collection was performed by the examiner and a trained recorder using IOTN-DHC ruler under

natural day light. Dental Health Component of the Index of Orthodontic Treatment Need (IOTN-DHC) was used to assess the students' orthodontic treatment need. The DHC grade was determined from the records according to the highest scoring anomaly in the hierarchical scale. DHC grade 1–2 represented no or slight need for treatment, grade 3 represented moderate or borderline need for treatment and grades 4–5 represented need or definite need for orthodontic treatment. Each and every participants were presented with toothbrush and toothpaste after data collection.



Figure 1. Clinical data collection with IOTN-DHC ruler

The collected data were cleansed and entered in Statistical Package for the Social Sciences (SPSS) (Version 22.0) and analyzed. The continuous variables were expressed by the means and standard deviations (Mean \pm S.D) and analyzed by one way ANOVA. The relationship between IOTN-DHC and PIDAQ was analyzed using Spearman's correlation analysis. The study was granted the ethical clearance from Research and Ethical Committee of University of Dental Medicine, Mandalay.

Results

Mean age of the university students was 18.76 ± 2.31 years with minimum 16 years and maximum 30 years. Out of 277

students, 122 (44%) were male and 155 (56%) were female. Most students in this study were first year students (55.7% in male and 34.2% in female). Major portion of students (63.9%) had an experience of dental service utilization.

Table 1 showed distribution of IOTN-DHC grading among the participants. In both male and female groups, most of the students represented Grade 1, and about equal distribution in Grade 2 to 4 while only a few participants had Grade 5.

Table 1. Frequency distribution of IOTN-DHC Grading among university students (n=277)

IOTN-DHC Grading	Male n	Female n	Total n (%)
Grade 1	50	77	127 (45.4)
Grade 2	26	38	64 (22.9)
Grade 3	22	21	43 (15.8)
Grade 4	22	16	38 (14.2)
Grade 5	2	3	5 (1.8)
Total n (%)	122 (44.0)	155 (56.0)	277 (100)

Mean PIDAQ total scores were 32.91 ± 13.03 in males and 30.66 ± 14.38 in females. The DSC score was highest and AC score was lowest in both gender (Table 2).

Table 2. Mean PIDAQ score (total and subscale) of university students (n=277)

PIDAQ scores		Male Mean \pm SD	Female Mean \pm SD	Total Mean \pm SD
Total PIDAQ (0-92)		32.9 \pm 13.0	30.6 \pm 14.3	31.65 \pm 13.83
Sub scales	Dental Self-confidence (DSC) (0-24)	12.9 \pm 5.1	13.6 \pm 5.3	13.37 \pm 5.26
	Social Impact (SI) (0-32)	9.1 \pm 6.6	6.7 \pm 5.8	7.79 \pm 6.32
	Psychological Impact (PI) (0-24)	8.4 \pm 4.4	7.8 \pm 4.7	8.09 \pm 4.64
	Aesthetic Concern (AC)(0-12)	2.3 \pm 3.1	2.4 \pm 3.3	2.40 \pm 3.26

There was statistically significant difference of total PIDAQ scores among IOTN-DHC grading in male students ($p = 0.015$) (Table 3).

Table 3. Comparison of total PIDAQ scores among different IOTN-DHC grading by gender (n=277)

Total PIDAQ scores	IOTN-DHC grading Mean \pm SD			<i>p</i> value*
	Grade 1-2	Grade 3	Grade 4-5	
Male	30.3 \pm 11.3	35.7 \pm 14.5	38.3 \pm 14.8	0.015
Female	29.6 \pm 14.1	32.9 \pm 14.2	34.1 \pm 15.8	0.347

* ANOVA test

Table 4. Comparison of subscales of PIDAQ scores among different IOTN-DHC grading (n=277)

Subscale s of PIDAQ scores	IOTN-DHC grading Mean±SD			p value*
	Grade 1-2	Grade 3	Grade 4-5	
DSC	13.1± 5.3	13.7± 4.9	14.1± 5.0	0.443
SI	7.0± 5.6	8.9± 6.7	10.2± 7.9	0.005
PI	7.6± 4.4	8.9± 4.3	9.3± 5.5	0.035
AC	2.2± 3.1	2.8± 3.5	2.7± 3.6	0.425

* ANOVA test

In table 4, SI and PI subscales of PIDAQ scores were significantly different among the groups ($p = 0.005$, $p = 0.035$ respectively).

Table 5. Correlation between total PIDAQ scores and IOTN-DHC grading by gender (n=277)

Gender	ρ ho*	p value*
Male	0.243	0.007
Female	0.119	0.141

*Spearman's correlation

Table 5 revealed that there was significant but only weak positive correlation between PIDAQ scores and IOTN-DHC grades among male students (ρ ho= 0.243).

Discussion

The present study was carried out among university students in Kyaukse Township, Mandalay Region to evaluate malocclusion status by IOTN and its psychological impact. Regarding IOTN-DHC grading, Grade 1-2 (no or slight need for treatment) (68.3%) was commonly observed among university students. And it was followed by Grade 3 (borderline treatment need) and Grade 4-5 (definite

need for treatment) which showed equal distribution (15.5% for each grade).

Similarly, in a study performed by Yi et al. (2016) at two universities in China among 374 young adults (19-24 years), and it was described that most of the students (49.2%) required no need for orthodontic treatment (Grade 1-2) and lowest proportion (19.0%) was in Grade 4-5 [8]. However, some studies revealed that the major portion of the participants were in Grade 3 (48.0% of dental students in Myanmar and 45.2% of dental students in Sudan) [12, 14].

In this study, mean total PIDAQ score of male was 32.91 ± 13.03 and that of female was 30.66 ± 14.38 . Among the subscales of PIDAQ, dental self-confidence (DSC) was the most frequently affected one, 12.97 ± 5.16 in males and 13.68 ± 5.33 in females while aesthetic concern (AC) was least affected (2.35 ± 3.16 in males and 2.43 ± 3.35 in females) (Table 2).

Likewise, mean total PIDAQ score of Chinese undergraduate students was 26.15 (11.24) in male students and 28.36 (11.74) in female students. The highest mean PIDAQ subscale was DSC subscale (10.28 ± 4.00 in males and 10.46 ± 4.10 in females) and the lowest subscale was AC i.e. 3.18 ± 1.52 in males and 3.50 ± 1.67 in females [6]. However, in a study carried out in South Africa among patients aged 13-29 years seeking orthodontic treatment, greater mean total PIDAQ score compared to this study was found (43.65 ± 15.18 in males and 46.06 ± 16.47 in females). The most commonly affected subscale in both male and female patients was psychological impact (PI) i.e. 13.98 ± 5.74 and 15.57 ± 6.16 respectively [8].

The results of the present study suggested that orthodontic-related quality of life was affected in students with higher IOTN-DHC grade especially psychosocial and social impacts (Table 3 and 4). These results agreed with the previous findings

that the perception of personal dental appearance was significantly correlated with DHC indicating the dissatisfaction with personal dental appearance was generally related to the severity of occlusal irregularities [12].

According to Spanish study of the psychosocial impact of dental aesthetics questionnaire (PIDAQ) among adolescents, both total PIDAQ and each subscale were significantly different among the participants with IOTN-DHC Grade 1-2, Grade 3 and Grade 4-5 indicating that the adolescents with higher orthodontic treatment need consequently had higher psychosocial impact due to malocclusion [2].

In the present study, only a weak positive correlation was found between IOTN-DHC grading and total PIDAQ scores in male ($\rho = 0.243$, $p = 0.001$) (Table 5). The similar finding was revealed in one of studies previously carried out in Myanmar in which a weak positive correlation was identified between IOTN-DHC and the perception of their personal dental appearance ($\rho = 0.249$, $p = 0.013$) [12].

But, there were certain studies revealing a good correlation between malocclusion severity and OHRQoL. Bellot et al. (2015) performed a study among university students in Spain and Portugal and disclosed that there was good linear correlation between PIDAQ and IOTN AC ($r = 0.550$, CI 95% 0.48-0.61) [15]. Again, the study of malocclusion severity and psychosocial impacts among Chinese students reported a significant positive correlation between IOTN-DHC grade and total or subscale PIDAQ scores ($\rho = 0.720$, $p < 0.01$) and the psychosocial impacts of malocclusion increased with the increase of malocclusion severity [6].

The findings of above mentioned studies reflected that individuals with malocclusion may not satisfy with their facial appearance, resulting in

inappropriate social responses and development of emotional and mental problems and OHRQoL is disturbed in a large proportion of affected individuals. If orthodontic treatments are carried out during adolescence and early adulthood to solve malocclusion problems, adverse emotional and mental consequences can be prevented throughout the individual's life [6].

The present study had some limitations. Firstly, the study population was not representative for the entire university student population. Another limitation was that other influencing factors on their quality of life apart from existence of malocclusion were not explored. Further researches are definitely required in not only for these perspectives but also for other population groups.

Conclusion

According to IOTN-DHC, although nearly one-fifth of the participants need some form of orthodontic treatment clinically, total psychological impact score was low in this study. IOTN is a reliable clinical and epidemiological tool to assess the orthodontic treatment needs in both individual and community settings, but only a weak positive correlation between PIDAQ scores and IOTN-DHC grading was revealed among male university students. PIDAQ might not be assessed the actual psychosocial impact of malocclusion. Furthermore, oral health awareness among participants might not be sufficient enough to have the impact on their daily life. The information from the present study may provide baseline data for oral health promotion programs particularly regarding orthodontic treatment need in university students.

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