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Original Research Article

EVALUATION OF ORTHODONTIC TREATMENT NEED AND ITS ASSOCIATION WITH SELF-ESTEEM AND ORAL HEALTH-RELATED QUALITY OF LIFE OF PATIENTS RECEIVING CARE AT SAIDU COLLEGE OF DENTISTRY, SWAT

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Abstract: *Orthodontic treatment needs can impact both self-esteem and oral health-related quality of life (OHRQoL). The relationship between these factors, particularly in a developing region, remains underexplored.* ***Objective:*** *To investigate the relationship between orthodontic treatment needs, self-esteem and oral health-related quality of life among patients at Saidu College of Dentistry, Swat.* ***Methods:*** *This cross-sectional study was conducted at Saidu College of Dentistry, Swat and included 115 participants aged 8-30 years. Data were collected using the Index of Orthodontic Treatment Needs (IOTN), Rosenberg Self-esteem Scale and Oral Health Impact Profile (OHIP-14) over a six-month period. Demographic variables such as age, gender and socioeconomic status were also analyzed. Descriptive statistics and statistical tests such as chi-square and t-tests were employed to evaluate associations between variables, with significance set at $p < 0.05$.* ***Results:*** *Of the 115 participants, 59.1% were male and 40.9% were female. Age groups were distributed as 33% (8-15 years), 39.1% (15-22 years) and 27.8% (22-30 years). Socioeconomic analysis revealed that 25.2% belonged to the upper class, 49.6% to the middle class and 25.2% to the poor class. Severe orthodontic treatment needs were identified in 36.5% of participants. Self-esteem scores were unaffected by gender, age, or socioeconomic status. In contrast, oral health impact scores were notably high, with a mean OHIP-14 score of 19.77±17.7, indicating a significant need for comprehensive oral health care.* ***Conclusion:*** *Despite high orthodontic treatment needs, participants exhibited stable self-esteem levels, suggesting resilience in psychosocial health. The findings emphasize the strong connection between orthodontic needs, OHRQoL and patient demographics, providing important insights for oral health professionals in addressing both clinical and psychological aspects of care.*

Keywords: Orthodontic Treatment, Self-Esteem, Oral Health, Psychosocial Well-Being, Dental Aesthetics

Introduction

An individual's self-esteem is shaped by their appearance, beliefs, emotions and behaviors. Life satisfaction increases with self-esteem. Individuals' judgments within cultural and value settings are crucial, with "health-related quality of life" (OHRQoL) measuring physical, psychological and social functioning (1, 2). The common oral health issue of malocclusion lowers quality of life. OHRQoL and malocclusion are measured using the Index of Orthodontic Treatment Needs (IOTN) and the oral health impact profile (OHIP-14) (3). Quality oral health care may change orthodontic treatment rates.

Self-esteem affects appearance, attitudes, emotions, behaviors and total well-being. Understanding its complex relationship with life's happiness is vital. In addition, "health-related quality of life"—which includes physical, psychological and social factors—measures the larger cultural and value framework of quality of life (3-5). The IOTN and oral health impact profile are needed because malocclusion, a frequent oral health issue, lowers quality of life. The comprehensive examination must acknowledge that oral healthcare availability impacts treatment needs.

Numerous studies have examined the complex interaction between orthodontic treatment demands, self-esteem and OHRQoL, showing how malocclusion affects psychological well-being (6, 7). Studies have shown that malocclusion, beyond its physical effects, affects self-esteem, which affects an individual's opinion of their look, confidence and life satisfaction (8). Teens are susceptible to malocclusion's aesthetic impacts and strongly link self-esteem to oral health-related quality of life (9). These relationships emphasize the need for a holistic orthodontic strategy that considers both malocclusion's clinical and psychological aspects.

OHRQoL research has shown that untreated malocclusion can impair eating, speaking and oral hygiene, affecting daily functioning and life satisfaction (10, 11). Comprehensive orthodontic interventions are needed since such issues might affect social and emotional well-being. Studies also show cultural and demographic factors influence orthodontic treatment demands, self-esteem and OHRQoL (12-14). These varied influences are essential for designing effective and culturally sensitive orthodontic care techniques, emphasizing the necessity of research in assessing orthodontic treatment's holistic impact on patients' well-being.

Despite the available literature, the complex relationship between orthodontic treatment demands, self-esteem and OHRQoL in distinct cultures is yet unknown. Targeted and culturally sensitive oral healthcare requires understanding these interactions. By examining orthodontic treatment demands, self-esteem and OHRQoL in SWAT patients, this study seeks to close this gap. To evaluate the orthodontic treatment need. To explore their association with self-

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esteem and oral health-related quality of life among patients receiving care at Saidu College of Dentistry, SWAT.

Methodology

This cross-sectional study included 19±11yearolds who gave oral informed consent or had their parents do so. A 95% confidence interval and 9% margin of error were used to calculate the study's sample size of 115 patients using Open-Epi's online calculator.

Participants met age, general health and dental problem requirements, including missing teeth, crowding, overjet, open bite, midline diastema, spacing and anteroposterior molar relationship. Patients with untreated dental cavities, periodontal illnesses, significant dentofacial abnormalities, poor periodontal health, orthodontic treatment, mental disabilities, temporomandibular joint disorders and arthritis were excluded.

Data collection for the study followed WHO oral health survey recommendations, conducted in a dental chair with appropriate equipment. The Index of Orthodontic Treatment Need-Dental Health Component (IOTN-DHC) assessed various occlusal features and treatment needs, categorized into different grades. Additionally, patients completed OHIP-14 questionnaires to evaluate oral health across seven domains and the Rosenberg Self-esteem Scale was used to measure self-esteem. These assessments provided comprehensive insights into the participants' oral health and psychological well-being.

Data analysis was performed using SPSS version 25. Categorical variables were expressed as frequency and percentage, while numerical variables were presented as mean ± standard deviation. Effect modifiers, including age, gender, socioeconomic status and IOTN grading, were addressed through stratification. Post-stratification scores were compared using the chi-square test, with statistical significance set at $p < 0.05$. The study aimed to comprehensively evaluate orthodontic treatment needs, self-esteem and OHRQoL among patients at Saidu College of Dentistry in Swat, shedding light on the intricate interplay between these factors.

This study received approval from the Ethical Review Board of Saidu College of Dentistry in Swat vide No. 134-ERB/023.

Results

At Saidu College of Dentistry, Swat, patients' orthodontic treatment demands, self-esteem and dental health-related quality of life are examined. Most participants (40.9%) were female, whereas 59.1% were male (figure 1). 33% were 08-15 years old, 39.1% 15-22 years old and 27.8% 22-30 years old (figure 2). Figure 3 shows that 25.2% were high class, 49.6% middle class and 25.2% impoverished.

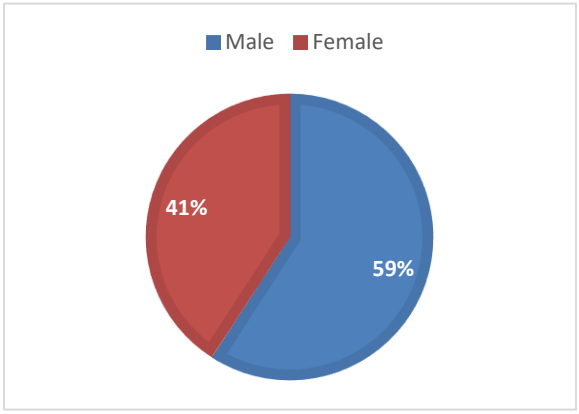

Figure 1: Gender

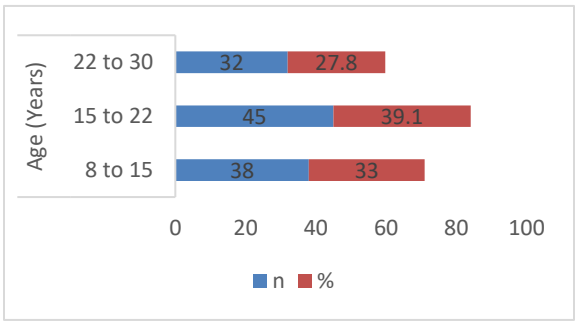

Figure 2: Age

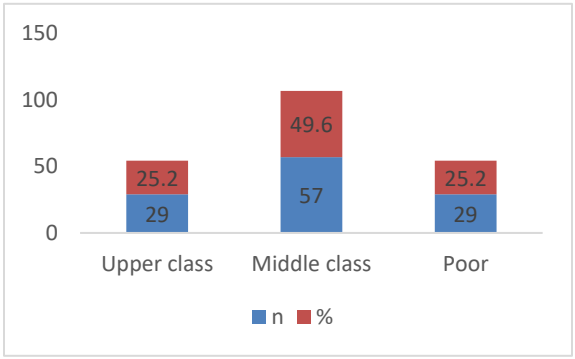

Figure 3: Socioeconomic Status

Table 1 shows participant demographics and IOTN grades. The distribution of IOTN grading showed that 5.2% needed no or mild treatment, 14.8% borderline treatment, 25.2% severe treatment and 36.5% 42, with no statistically significant association across gender ($p = 0.758$), age groups ($p = 0.603$) and socioeconomic status ($p = 0.253$). These findings detail research participants' demographics and orthodontic treatment needs.

Table 1: Frequency and percentage of demographic characteristics and IOTN grading

Variable		No/ Mild treatment needed n (%)	Borderline n (%)	Severe treatment needed, n (%)	P- Value
Gender	Male Female	19(13.9) 9(7.8)	19(16.5) 12(10.4)	33(28.7) 26(22.6)	0.758
Age (Years)	08-15 15-22 22-30	7(6.1) 13(11.3) 15(4.3)	11(9.6) 12(10.4) 8(0.7)	20(17.4) 20(17.4) 19(16.5)	0.603

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Socioeconomic status	Upper class Middle class Poor	9(7.8) 9(7.8) 7(6.1)	10(8.7) 14(12.2) 7(6.1)	10(8.7) 34(29.6) 15(13)	0.253
IOTN Grading		17(14.8)	29(25.2)	42(36.5)	0.538

Table 2 shows how OHIP-14 scores relate to orthodontic treatment needs, gender, age and socioeconomic position. This table summarizes the oral health impact of orthodontic treatment demands and demographic characteristics on study participants. OHIP-14 responses are categorized as Strongly Disagree, Disagree, Agree and Strongly Agree with mean scores. The means±SD values for each item are also supplied. OHIP-14 scores are also categorized by orthodontic treatment degree (No or Mild, Borderline Treatment). High mean scores suggest Strongly Agree as the most common response to all questions (Q1–Q10). Self-esteem is consistent across orthodontic treatment demands. To evaluate association statistical significance, gender, age and socioeconomic status p-values are shown. In Q1, 40.9% strongly agree that oral health impacts them, with a mean score of 3.09±0.94. The stratified ratings for orthodontic treatment needs (3.36±0.75, 3.06±0.81, 3.05±0.91) show a non-significant gender p-value of 0.549. Age (p-values 0.206–0.905) and socioeconomic level (0.061–0.958) do not significantly affect OHIP-14 scores across questions.

Table 3 shows the 10-item Rosenberg Self-esteem Scale questionnaire results on a four-point Likert scale. The data shows that many respondents strongly agreed with each item, indicating high self-esteem. Each question's mean scores support this. The impact of orthodontic treatment needs on self-esteem, subdivided by No or Mild Treatment, Borderline Treatment and Treatment Needed, shows few mean score differences. The p-values show no significant relationships between self-esteem ratings and demographic characteristics, including gender, age and socioeconomic level. In conclusion, this study's participants have strong self-esteem regardless of orthodontic treatment needs or demographics. Table 3 shows the Rosenberg Self-esteem Scale's 10 four-point Likert scale questions (strongly agree = 4, agree = 3, disagree = 2, strongly disagree = 1). The items display the frequency and percentage of responses in the Strongly Disagree, Disagree, Agree and Strongly Agree categories and their means±SD values.

Table 3 shows stratified scores by orthodontic treatment degree (No or Mild Treatment, Borderline Treatment, Treatment Needed) and p-values for gender, age and socioeconomic status. For example, 40.9% of respondents strongly agree with Q1, suggesting stronger self-esteem, with a mean score of 3.09±0.94. Stratified scores show minor differences within orthodontic treatment categories and p-values show no significant relationships with gender (0.549), age (0.206–0.905), or socioeconomic level (0.26–0.958). Summing all item replies yields the questionnaire's score, which varies from 1 to 40. Respondents' mean ratings support this trend, showing high self-esteem. When subdivided by orthodontic treatment needs (No or Mild Treatment, Borderline Treatment and Treatment Needed), mean scores vary little, suggesting a constant self-esteem level. Statistical analyses show no significant relationships between self-esteem and gender, age, or socioeconomic position ($p > 0.05$). In conclusion, study participants have strong self-esteem regardless of orthodontic treatment needs or demographics.

Table 2: OHIP-14 score

Scale Items	SD (n%)	D (n%)	A (n%)	SA (n%)	Mean±SD	No or Mild Treatment	Borderline Treatment Needed	Treatment Needed	P-value	P-value	P-values
Q1	3(2.6)	27(23.5)	38(33)	47(40.9)	3.09±0.94	3.36±0.75	3.06±0.81	3.05±0.91	0.549	0.781	0.293
Q2	8(7)	19(16.5)	44(38.3)	44(38.3)	3.07±0.90	3.04±9.78	3.03±0.83	3.11±0.93	0.773	0.432	0.958
Q3	80(69.6)	15(13)	15(13)	5(4.3)	1.52±0.88	1.52±0.77	1.16±9.26	1.52±0.91	0.761	0.634	0.248
Q4	9(7.8)	25(21.7)	46(40)	35(30.4)	2.93±0.91	3.12±0.78	2.61±1.01	3.00±0.89	0.206	0.92	0.213
Q5	66(57.4)	30(24.2)	14(11.3)	5(4.3)	1.63±0.86	1.64±0.90	1.35±0.60	1.77±0.92	0.417	0.313	0.514
Q6	13(11.3)	20(17.4)	35(30.4)	47(40.9)	3.00±1.02	3.16±1.06	2.93±0.96	2.98±1.04	0.276	0.872	0.061
Q7	14(12.2)	21(18.3)	36(31.3)	44(38.3)	2.95±1.02	3.16±0.86	2.77±1.11	2.88±1.01	0.368	0.442	0.6
Q8	42(36.5)	23(20)	22(19.1)	28(24.3)	2.31±1.20	2.12±1.16	2.25±1.12	2.42±1.26	0.583	0.3	0.663
Q9	37(32.2)	17(14.8)	24(20.9)	37(32.2)	2.53±1.24	2.36±1.22	2.83±1.18	2.44±1.27	0.556	0.896	0.26
Q10	62(53.9)	23(18.5)	7(5.6)	23(18.5)	1.92±1.18	2.28±1.36	1.64±0.98	1.91±1.17	0.244	0.905	0.663

Table 3: Rosenberg self-esteem scale

Scale Items	SD (n%)	D (n%)	A (n%)	SA (n%)	Mean±SD	No or Mild Treatment	Borderline Treatment Needed	Treatment Needed	P-value	P-value	P-values
Q1	3(2.6)	27(23.5)	38(33)	47(40.9)	3.09±0.94	3.36±0.75	3.06±0.81	3.05±0.91	0.549	0.781	0.293
Q2	8(7)	19(16.5)	44(38.3)	44(38.3)	3.07±0.90	3.04±9.78	3.03±0.83	3.11±0.93	0.773	0.432	0.958
Q3	80(69.6)	15(13)	15(13)	5(4.3)	1.52±0.88	1.52±0.77	1.16±9.26	1.52±0.91	0.761	0.634	0.248
Q4	9(7.8)	25(21.7)	46(40)	35(30.4)	2.93±0.91	3.12±0.78	2.61±1.01	3.00±0.89	0.206	0.92	0.213
Q5	66(57.4)	30(24.2)	14(11.3)	5(4.3)	1.63±0.86	1.64±0.90	1.35±0.60	1.77±0.92	0.417	0.313	0.514

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Q6	13(11.3)	20(17.4)	35(30.4)	47(40.9)	3.00±1.02	3.16±1.06	2.93±0.96	2.98±1.04	0.276	0.872	0.061
Q7	14(12.2)	21(18.3)	36(31.3)	44(38.3)	2.95±1.02	3.16±0.86	2.77±1.11	2.88±1.01	0.368	0.442	0.6
Q8	42(36.5)	23(20)	22(19.1)	28(24.3)	2.31±1.20	2.12±1.16	2.25±1.12	2.42±1.26	0.583	0.3	0.663
Q9	37(32.2)	17(14.8)	24(20.9)	37(32.2)	2.53±1.24	2.36±1.22	2.83±1.18	2.44±1.27	0.556	0.896	0.26
Q10	62(53.9)	23(18.5)	7(5.6)	23(18.5)	1.92±1.18	2.28±1.36	1.64±0.98	1.91±1.17	0.244	0.905	0.663

SD: Strongly Disagree, D: Disagree, A: Agree, SA: Strongly Agree, a: P-Value (Gender), b: P-Value (Age), c: P-Value (Socioeconomic Status).

Discussion

Global oral public health care is essential, especially for children and young people who seek orthodontic treatment to improve dental aesthetics and self-esteem. Orthodontists must understand that young patients anticipate dental health, attractiveness, self-esteem and social life to improve. In resource-limited locations, prioritizing issues likely to affect Oral Health-Related Quality of Life (OHRQoL) requires prevalence studies on orthodontic treatment needs in children and young people. This study examined orthodontic treatment needs and OHRQoL in 8-30-year-olds at Saidu College of Dentistry, Swat's orthodontic department. OHRQoL's effects on treatment needs and self-esteem, measured by the Rosenberg self-esteem scale and OHIP-14 scale, were examined across age, gender and socioeconomic categories.

The study found that orthodontic treatment demands, gender, ageand family income significantly affected OHRQoL. 25 (21.7%) of the individuals needed little or no treatment, similar to Paes et al. (15) and Guerino et al. (16)'s sample of 12-18 year-olds (46%). 31 (27%) needed borderline treatment and 59 (51.3%) needed severe treatment. Compared to Ajwa et al. (17), their 12-18-year-old group had reduced borderline (23.5%) and definite (30.5%) orthodontic treatment needs. However, Bana et al. (18) and Alyami et al. (19) observed higher rates of no treatment need and lower rates of borderline and severe treatment needs in their 13-18 age group. The study participants' OHIP-14 score was 19.77 ±, 17.7showing a significant impact of malocclusion on daily activities and OHRQoL. High frequency, severity and oral issue recognition may explain the high OHIP-14 score. This age group may have more periodontal disease and tooth loss, which may explain the high score. The mean scores were exceptionally high across functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap, suggesting that malocclusion increases embarrassment, discomfort, difficulty with daily tasks and social challenges. Many Rosenberg Self-esteem Scale respondents chose "Strongly Agree" for each item, indicating high self-esteem. The mean ratings for each question reflect this observation, highlighting individuals' strong self-esteem. The study also examines how orthodontic treatment affects self-esteem by treatment category, finding few mean deviations. Statistical investigations consistently indicate no significant relationships between self-esteem scores and demographic characteristics like gender, age, or socioeconomic status. Orthodontic therapy improves self-esteem, according to a study. Orthodontic therapy improves psychosocial well-being, including self-esteem, according to several research (20, 21). However, the current study challenges the idea that orthodontic worries may severely affect self-esteem by showing that they are consistent and robust across varied orthodontic treatment demands.

Current research confirms participants' positive self-esteem regardless of orthodontic treatment needs or demographics. This supports recent findings that orthodontic problems and demographics may not significantly affect self-esteem (22). The homogeneity in self-esteem across treatment categories undermines the idea that people with more severe orthodontic needs have lower self-esteem.

Limitations include its cross-sectional design, reliance on self-reporting, limited generalizability, lack of information on participants' orthodontic history and other influencing factors. Furthermore, due to the selected population and reduced sample size, the current study needs further evaluation in the future.

Conclusion

The demographic analysis revealed a predominantly male population with diverse ages and socioeconomic backgrounds, with a notable portion requiring severe orthodontic treatment. Despite this, no significant associations were found across gender, age, or socioeconomic status. OHRQoL assessments using OHIP-14 scores indicated a high impact of oral health on participants, with consistent scores regardless of treatment needs or demographics. Similarly, self-esteem levels measured by the Rosenberg Self-esteem Scale remained consistently high across all groups, unaffected by orthodontic needs or demographic factors.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department concerned. (134-ERB/023)

Consent for publication
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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

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Coordination of collaborative efforts.
Manuscript drafting.
ALI HASSAN QURESHI
Study Design, Review of Literature.

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