

PROLONGED ORTHODONTIC TREATMENT, PSYCHOLOGICAL WELL-BEING, AND FRUSTRATION IN PAKISTANI ADULTS: A QUANTITATIVE COMPARATIVE STUDY

Original Research

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ABSTRACT

Background: Frustration and psychological well-being are critical factors influencing the experiences of orthodontic patients, particularly during prolonged treatment durations. While global research has explored the psychosocial impacts of orthodontic care, there is limited evidence addressing these variables within the Pakistani population. Cultural stigmas surrounding mental health and extended treatment durations may further exacerbate emotional distress, necessitating a focused investigation into these associations.

Objective: This study aimed to examine the relationship between treatment duration and its effects on frustration and psychological well-being among adult orthodontic patients in Pakistan, comparing those with treatment durations of less than four years to those exceeding four years.

Methods: A cross-sectional correlational research design was employed, and purposive sampling was used to recruit 343 participants from public and private hospitals in Lahore, Karachi, and Islamabad. Eligibility criteria included patients aged 18 years or older who had undergone at least six months of orthodontic treatment. The sample consisted of 273 men (80%) and 70 women (20%), with a mean age of 24.58 years (SD = 4.09). Data were collected using two validated instruments: the 18-item Psychological Well-being Scale and the 28-item Frustration Discomfort Scale. Correlational analysis and independent samples t-tests were performed using SPSS version 29.

Results: A significant negative correlation ($r = -0.10$, $p < .01$) was found between frustration and psychological well-being. Patients with treatment durations of more than four years reported higher frustration ($M = 75.91$, $SD = 13.40$) and lower psychological well-being ($M = 68.31$, $SD = 15.55$) compared to those treated for less than four years (frustration: $M = 74.68$, $SD = 8.89$; psychological well-being: $M = 70.38$, $SD = 17.00$). However, these differences were not statistically significant.

Conclusion: Prolonged orthodontic treatment appears to negatively influence psychological well-being and increase frustration, though without significant statistical evidence. These findings highlight the importance of addressing psychological factors during extended orthodontic care, particularly in culturally sensitive contexts like Pakistan.

Keywords: Frustration, Orthodontic Treatment Duration, Psychological Well-being, Adult Orthodontic Patients, Mental Health, Orthodontic Care, Pakistan.

INTRODUCTION

Orthodontic treatment, a widely recognized intervention for aligning teeth and improving dental function, contributes not only to enhanced aesthetics but also to the long-term health of teeth, gums, and jaw joints by distributing biting pressure evenly across the dental arch (1,2). Beyond physical health, orthodontic procedures are associated with significant psychological effects. Previous research suggests that undergoing orthodontic treatment can lead to improved mental health outcomes and a more positive body image perception (3). However, other studies highlight more complex psychological implications. For instance, while some individuals experience enhanced self-esteem post-treatment, others report declines in life satisfaction and self-perception during the treatment period, underscoring the nuanced psychosocial impact of dental interventions (4). The duration of orthodontic treatment has been identified as a critical factor influencing psychological well-being, which comprises dimensions such as self-acceptance, autonomy, positive relationships, personal growth, environmental mastery, and life purpose (5,6). Prolonged treatment durations have been linked to deteriorations in these factors, with patients frequently reporting heightened levels of frustration and mental health challenges (7,8). Frustration, often characterized by feelings of irritability and anger when goals remain unachieved, is a common response to extended treatment periods (9,10). Factors contributing to this frustration include difficulties in maintaining consistent dental hygiene, feelings of hopelessness about treatment outcomes, dietary restrictions, and financial strain associated with long-term orthodontic care (11–15).

Recent evidence suggests that treatment durations exceeding three years are associated with elevated symptoms of depression, emphasizing the emotional toll of prolonged orthodontic procedures (16). Additional studies highlight that individuals with pre-existing dental anxiety or low motivation levels experience increased pain and discomfort during treatment, further compounding psychological distress (17). Reduced motivation, diminished happiness, and overall compromised well-being have been consistently observed in patients undergoing lengthy orthodontic treatments (18,19). Despite global advancements in understanding the psychological effects of extended orthodontic care, there remains a scarcity of research focused on Pakistani adults. Existing literature does not sufficiently address how prolonged treatment impacts psychological well-being and frustration in this population. This gap is particularly significant considering the socio-economic and cultural factors unique to Pakistan, which may influence patients' experiences and responses to long-term orthodontic care. This study aims to investigate the association between the duration of orthodontic treatment and its psychological consequences, particularly focusing on well-being and frustration levels among Pakistani adults. Specifically, it examines whether patients undergoing treatment for more than four years experience greater frustration and diminished psychological well-being compared to those with shorter treatment durations. The findings aim to fill existing gaps in the literature, provide valuable insights for healthcare providers, and offer guidance for patients who might be vulnerable to psychological distress during extended orthodontic care. The primary objective is to assess whether a negative association exists between psychological well-being and frustration in relation to treatment duration, ultimately contributing to the development of more patient-centered orthodontic care strategies.

METHODS

The study employed a cross-sectional correlational research design to investigate the relationship between orthodontic treatment duration, psychological well-being, and frustration in adult patients. A purposive sampling technique was utilized to recruit 343 participants from public and private hospitals across Islamabad, Karachi, and Lahore. Inclusion criteria required participants to be at least 18 years of age, possess a minimum educational qualification of an intermediate level, and have undergone orthodontic treatment for a duration of at least six months. Both male and female participants were eligible for inclusion. Individuals who did not meet these criteria or had any underlying psychological disorders were excluded to maintain the study's focus on the psychological effects of orthodontic treatment alone. The Psychological Well-Being Scale, developed by Ryff and Keyes (1995), was employed to assess various dimensions of psychological well-being. This 18-item tool uses a 7-point Likert scale ranging from 1 ("most agreeable") to 7 ("too much agreeable"), with higher scores indicating greater psychological well-being. The scale demonstrated strong internal consistency, with Cronbach's alpha coefficients ranging from 0.87 to 0.93 in its original validation. To measure frustration levels, the Frustration Discomfort Scale was utilized. This 28-item instrument employs a 5-point Likert scale ranging from 1 to 5, with higher scores indicating increased frustration. In the current study, the reliability of the scale ranged from 0.84 to 0.94, signifying a high level of internal consistency.

Ethical considerations were strictly adhered to, following the guidelines of the American Psychological Association (APA) 7th edition code of conduct. Approval for data collection was obtained from the relevant departmental ethics committee, although no specific institutional review board (IRB) or reference number was mentioned in the available data. Further, official permission was sought and obtained from the original authors of the questionnaires used in this research. Participants provided written informed consent after being briefed on the study’s purpose, confidentiality assurances, and their right to withdraw at any point without any repercussions. Data collection involved administering a combined questionnaire that included demographic information alongside the standardized assessment tools. Participants completed the questionnaire in approximately 20 minutes. Efforts were made to ensure the confidentiality of responses, and participants were thanked for their voluntary contribution to the study. Statistical analysis was performed using IBM SPSS Statistics version 29. Correlational analysis was conducted to examine associations between the primary study variables: psychological well-being and frustration. Additionally, an independent samples t-test was applied to compare mean differences between two treatment duration groups—those undergoing orthodontic treatment for less than four years and those receiving treatment for more than four years—with respect to frustration and psychological well-being. This approach enabled the assessment of whether treatment duration significantly influenced psychological outcomes among orthodontic patients in Pakistan.

RESULTS

The demographic analysis of the participants revealed that out of a total of 343 individuals, 193 (56%) had undergone orthodontic treatment for more than four years, while 150 (44%) had treatment durations of less than four years. The participants had a mean age of 24.58 years with a standard deviation of 4.09. In terms of gender distribution, the sample was predominantly male, comprising 273 participants (80%), whereas 70 participants (20%) were female. Regarding educational qualifications, the majority held a bachelor’s degree (188 participants, 55%), followed by those with a master’s degree (128 participants, 37%), and a smaller proportion with an intermediate qualification (27 participants, 8%). The correlational analysis indicated a significant negative relationship between frustration and psychological well-being ($r = -0.10, p < .01$), suggesting that as frustration levels increased, psychological well-being tended to decrease.

An independent samples t-test was conducted to examine differences in frustration and psychological well-being between participants with orthodontic treatment durations of less than four years and those with durations exceeding four years. Participants with more than four years of treatment reported higher frustration scores ($M = 75.91, SD = 13.40$) compared to those with shorter treatment durations ($M = 74.68, SD = 8.89$). However, this difference was not statistically significant ($t(341) = -1.01, p = .31$, Cohen’s $d = 0.10$). In terms of psychological well-being, participants with treatment durations of less than four years scored higher ($M = 70.38, SD = 17.00$) than those undergoing treatment for more than four years ($M = 68.31, SD = 15.55$), but this difference also failed to reach statistical significance ($t(341) = 1.17, p = .24$, Cohen’s $d = 0.12$). These findings suggest that while there are observable trends indicating higher frustration and reduced psychological well-being in individuals with extended orthodontic treatment durations, these differences were not statistically significant.

Table 1: Demographic Characteristics of the Participants (N=343)

Characteristics	Frequency	Percentage
Orthodontic treatment duration of less than 4 years	150	44
Orthodontic treatment duration of more than 4 years	193	56
Parents of Children with Autism		
Men	273	80
Women	70	20
Qualification		
Intermediate	27	8
Bachelor	188	55
Master	128	37
Age (Mean & SD)	24.58	4.09

Table 2: Correlational Analysis between Study Variables (N=343)

Variables	1	2
1.Frustration	-	-.10*
2.Psychological Wellbeing		-

Note. **p<.01

Table 3: Mean differences between Parents of Children with Autism in Study Variables (N=343)

	OT duration of less than 4 years (n=150)		OT duration of more than 4 years(n=193)		t(341)	p	Cohen's d
	M	SD	M	SD			
Frustration	74.68	8.89	75.91	13.40	-1.01	.31	0.10
PW	70.38	17	68.31	15.55	1.17	.24	0.12

Note. M= Mean, SD= Standard Deviation, OT= Orthodontic treatment, PW= Psychological wellbeing

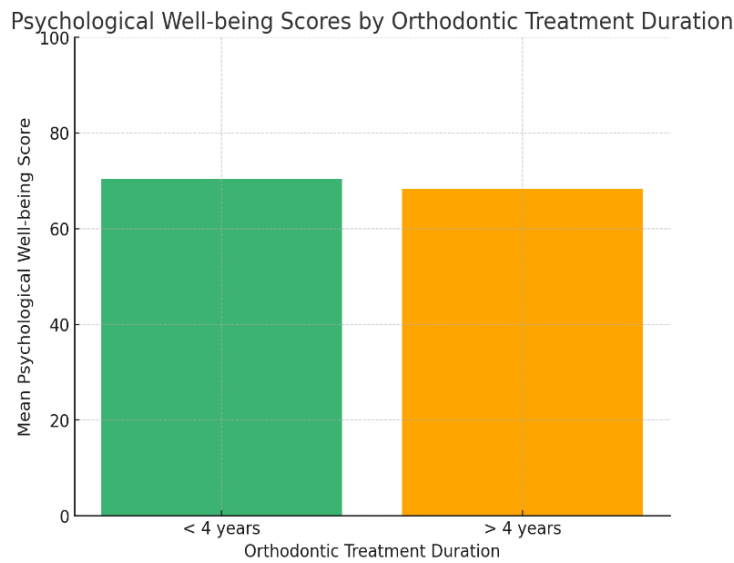


Figure 2 Psychological Well Being Scores by Orthodontic Treatment Duration

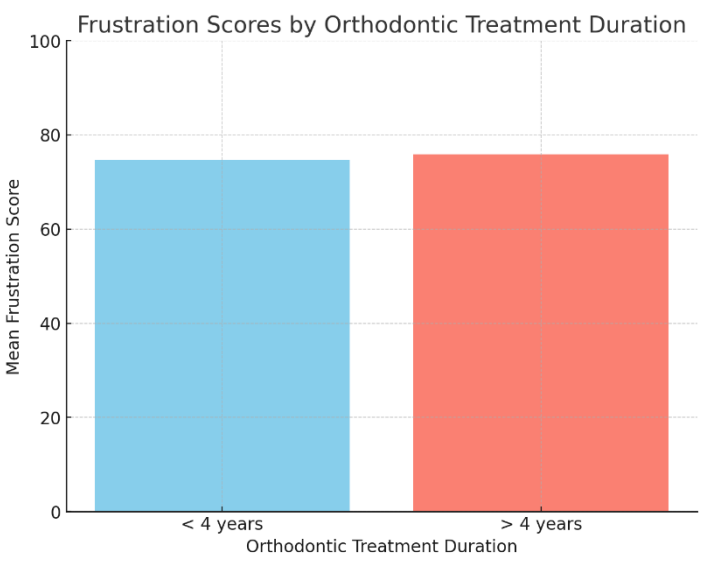


Figure 1 Frustration Scores by Orthodontic Treatment Duration

DISCUSSION

The study aimed to explore the relationship between orthodontic treatment duration, frustration, and psychological well-being among adult patients in Pakistan, addressing a gap in the existing literature concerning psychological outcomes associated with prolonged orthodontic treatment in this specific context. The findings revealed a significant negative association between frustration and psychological well-being, indicating that increased frustration levels were associated with diminished psychological well-being. This aligns with previous research that has highlighted the psychological challenges linked to orthodontic treatment, such as pain, difficulties in maintaining oral hygiene, dietary restrictions, and the emotional burden of delayed treatment outcomes. These factors collectively contribute to heightened frustration, which in turn adversely affects psychological well-being (1–5). Cultural factors, such as limited

awareness and underutilization of psychological support services in Pakistan, may exacerbate this relationship, leaving patients without adequate resources to cope with prolonged emotional strain (20-23). The comparison between treatment durations showed that patients undergoing orthodontic treatment for more than four years reported higher levels of frustration and lower psychological well-being compared to those with shorter treatment durations. Although these trends were consistent with prior findings that associate extended treatment with emotional distress, the differences observed in this study were not statistically significant. Several factors could explain this outcome. The adjustment to treatment over time might lead to an acceptance of discomfort, or patients might employ psychological defense mechanisms such as denial to cope with prolonged treatment challenges. Additionally, inherent personality traits or coping styles could have influenced the outcomes, potentially masking more pronounced psychological effects of extended treatment durations (24,25).

The strengths of the study lie in its focus on a largely understudied population and its attempt to quantify the psychological effects of orthodontic treatment within a cultural context where mental health remains a stigmatized topic. By using validated assessment tools with strong reliability, the study provided a solid foundation for evaluating psychological well-being and frustration among orthodontic patients. The robust sample size also added to the reliability of the results (26,27). However, the study was not without limitations. The geographic scope was restricted to major cities—Lahore, Karachi, and Islamabad—limiting the generalizability of the findings to other regions of Pakistan. Including participants from a broader range of cities and rural areas in future research would provide a more comprehensive understanding of the issue. Another limitation was the cross-sectional nature of the study, which captured data at a single point in time and could not track changes in psychological well-being and frustration over the treatment period. A longitudinal design would be better suited to observe how psychological responses evolve as treatment progresses (28).

Gender imbalance in the sample was another notable limitation, with a significant overrepresentation of male participants. Future research should aim for gender parity to ensure that the findings accurately reflect the experiences of all patients. Moreover, the distribution of participants across educational qualification categories was uneven, preventing advanced statistical comparisons such as ANOVA from being conducted effectively. Ensuring balanced demographic representation across educational backgrounds in future studies would allow for more nuanced analyses (29). An additional limitation was the categorization of treatment duration into only two groups—less than four years and more than four years. A more detailed classification, such as dividing patients into groups of 1–2 years, 2–4 years, and over four years, would offer deeper insights into how different treatment stages affect psychological outcomes (30,31).

The findings carry important clinical and social implications. There is a clear need for increased awareness around the psychological impacts of prolonged orthodontic treatment, both within the dental community and among patients. Interventions led by mental health professionals should be integrated into orthodontic care to help patients cope with treatment-related frustration and emotional distress. Furthermore, healthcare policymakers in Pakistan should consider implementing regulations to prevent unjustified extensions of treatment duration and ensure affordability for middle-income families. Orthodontists also have a responsibility to set realistic expectations regarding treatment duration and outcomes to minimize patient frustration (12). While this study provides valuable insights into the psychological effects of orthodontic treatment duration, the findings underscore the need for more extensive research involving diverse populations, longitudinal designs, and a more balanced demographic representation. These efforts would contribute to a comprehensive understanding of the psychosocial consequences of orthodontic care, ultimately leading to more patient-centered and psychologically supportive treatment practices.

CONCLUSION

This study concluded that prolonged orthodontic treatment is associated with increased frustration and diminished psychological well-being among adult patients in Pakistan, although these differences were not statistically significant. The findings highlight the emotional and psychological challenges faced by individuals undergoing extended orthodontic care, underscoring the need for patient-centered interventions and psychological support throughout the treatment process. These results contribute to a better understanding of the psychosocial impacts of long-term orthodontic treatment in a cultural context where mental health awareness remains limited. The study emphasizes the importance of honest communication between orthodontists and patients regarding treatment duration and outcomes while encouraging healthcare providers to integrate mental health support into routine care. Ultimately, these insights can guide future research and help shape policies that promote more compassionate and effective orthodontic treatment practices.

AUTHOR CONTRIBUTIONS

Author	Contribution
Farah Iqbal	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Aymen Zahid*	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Muhammad Bilal Arif	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Sukaina Fatima	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Muhammad Bin Noor	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Hira Shakil	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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