Original Article
DOI: https://doi.org/10.70749/ijbr.v3i7.1927

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://ijbr.com.pk
ISSN: 2960-2793/ 2960-2807

Pain Perception, Personality Trait and Attitude toward Orthodontic Treatment among the Patients Visiting at the Tertiary Care Hospital Jamshoro

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ARTICLE INFO

Keywords: Pain Perception, Personality Traits, Orthodontics, Attitude, VAS, NEO-FFI, Compliance.

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Declaration
Authors' Contribution
All authors equally contributed to the study and approved the final manuscript

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History
Received: 12-06-2025 Revised: 28-06-2025
Accepted: 08-07-2025 Published: 15-07-2025

ABSTRACT

Introduction: Pain perception and psychological readiness significantly influence orthodontic treatment outcomes. Individual differences in personality traits can impact how patients experience pain and respond to treatment protocols. **Objective:** To assess the frequency of pain perception, personality traits, and attitude toward orthodontic treatment among patients visiting a tertiary care hospital in Jamshoro. **Materials and Methods:** A cross-sectional study was conducted from February, 2025 to May, 2025.at the Orthodontic Department, Liaquat University of Medical and Health Sciences, Jamshoro. A total of 295 patients aged 15–25 undergoing fixed orthodontic treatment were assessed using validated questionnaires, including the Visual Analogue Scale (VAS) for pain, NEO-Five Factor Inventory for personality, and Likert-scale for attitude. Data were analyzed using SPSS version 26. **Results:** Moderate pain was reported by 46.4% of participants. Positive attitude was observed in 69.2%, and 70.5% had good-to-excellent personality profiles. Significant associations were found between personality traits, pain levels, and treatment attitude. **Conclusion:** Personality traits influence the perception of pain and the disposition towards treatment, influencing compliance and satisfaction.

INTRODUCTION

While orthodontic treatment is an excellent method of correcting dental malocclusions and improving oral function and appearance, it is often accompanied by some pain and discomfort, making patients less compliant, diminishing the treatment's success. Many recent studies are continuing to affirm the complicated relationship between psychological and physiological factors of the pain experience during orthodontic treatment. Personality traits are one individual difference that has been demonstrated to contribute to how patients perceive and report pain and their general attitude toward orthodontic treatment (1). Pain perception is subjective and vary between individuals, including a composite of cognitive and emotional responses, previous experiences with pain, and their psychological profile (2). These features integrate and form how the orthodontic patient views their orthodontic treatment experience. It may be viewed as tolerable and worthwhile or complicated and painful.

Studies have steadily accumulated evidence that certain personality traits correlate with different pain sensitivity levels. For instance, patients with high levels of neuroticism are often more likely to manifest pain or pain behaviours in response to painful stimuli from braces or orthodontic office procedures, due to anxiety and emotional reactivity (3). Patients who display high levels of neuroticism may have reduced tolerance levels related to discomfort. The patients or caregivers who demonstrate high neuroticism may demonstrate lower compliance with treatment protocols. Additionally, the pain expectation driven by personality types (anxiety) may increase the pain experience related to orthodontic procedural care, for instance, bracket placement, wire adjustments, etc (4). Therefore, it is apparent that clinicians may wish to assess psychological characteristics when planning and managing orthodontic daily treatment as well as physical factors.

The experience of pain during orthodontic treatment is also influenced by the type and quality of information provided to the patients. For example, a study demonstrated that a combination of verbal and written descriptions of the pain control techniques was able to

significantly decrease perceived pain and analgesic use in adolescent orthodontic patients (5). This suggests that educational interventions can help diminish the potentiation of the pain experience from anxiety. In addition, the amount of knowledge, understanding, and attitudes about the orthodontic treatment can all impact expectations and readiness, influencing the patient's pain experience (6). A positive attitude has been shown to correlate with better coping strategies and lower pain associated with treatment, while patients with misinformation or unrealistic expectations about treatment may develop negative conceptualizations of treatment and result in non-compliance.

Personal characteristics also affect how motivated or committed patients feel about maintaining their treatment plan, especially adolescents. Adolescents with high levels of conscientiousness and self-discipline were more likely to comply and to have had the most perseverance across the long duration of orthodontic treatment, even through discomfort (5). Social-culture factors, self-image influences, and psychosocial expectations are also in place as an individual's motivation for orthodontic treatment, especially in adult populations, who may be treated for functional or aesthetic issues (6). Adults tends to assess the positives of the treatment versus any considerations of pain, discomfort, and lifestyle alterations, and their feelings towards pain plays an important role in whether they continue or are satisfied with treatment.

Pain response mechanisms, such as anxiety and depression, are complex, and the response to pain or discomfort in an orthodontic context is broader than the immediate response to an orthodontic appliance. A person who experiences anxiety or depression is likely to report experiencing more discomfort than a person who does not, and anxiety and depression have been shown to not only increase pain perception but also impact memory of pain and continue the experience, influencing future visits to the dentist or orthodontist and compliance. Engagement with orthodontic discomfort is just one element influencing discomfort alongside others related to orthodontic appliances, such as brackets and wires, and discomfort is one of the significant barriers to treatment. Although discomfort during orthodontic treatment may be relatively predictable, there are still variables that take the form of the expectations of the patient and their emotional intelligence and resilience when responding to discomfort. Understanding psychosocial dynamics such as motivation, perceived benefit, and emotional responses to pain experience is crucial for patient-centered orthodontic care.

Interestingly, expectations about the experience of aesthetics, social approval, and elevated self-esteem can play a strong role in helping the patient to begin and continue treatment, even if it is uncomfortable (11). Likewise, barriers to accessing orthodontic services have been identified for many individuals. Conversely, the fear of pain, the cost of treatment, and the lack of social acceptance were barriers to seeking orthodontic treatment (12). The various pain assessment tools developed to explore pain further highlight the importance of utilizing personalized pain care practices. One of the main themes identified was the level of individual experience of pain in various patient populations (13). Patients also vary widely with respect to their motivations and goals for orthodontic treatment, where some patients are motivated by their peers and others focus on health or aesthetics (14). While personality traits are not limited to orthodontics, the relationship between traits and pain has also been documented in other clinical areas around health care delivery. Studies in ophthalmology identified that neuroticism traits can predict the degree of postoperative pain experience, extending this phenomenon across medical specialties (15).

Finally, the application of numerical pain scales in the orthodontic clinical environment has allowed objective quantification of the subjective experience of pain, which has identified consistent relationships between personality profiles and reported pain intensity (16). This research emphasizes a biopsychosocial approach to orthodontic care that incorporates psychosocial assessments and traditional clinical care assessments. These tools, used to detect a patient's personality traits and attitudes early during the treatment process, will enhance the clinician's ability to predict their findings regarding pain responses and to improve patient satisfaction, as well as their likelihood to comply with treatment. This makes for an even more significant consideration in a tertiary care environment, where multiple presenting patient populations with unique psychosocial profiles may influence their reaction to orthodontic treatment.

Objective

The aim of this study was to evaluate the frequency of pain perception, personality traits, and attitude toward orthodontic treatment of patients visiting the tertiary care hospital at Jamshoro.

MATERIALS AND METHODS

Design: Cross-sectional Design.

Study setting: The research was done at the Orthodontic Department of Liaquat University of Medical and Health Sciences (LUMHS), Jamshoro, Hyderabad, Pakistan.

Duration: The research was done in the duration of four months, from February, 2025 to May, 2025.

Inclusion Criteria: Both male and female patients between the ages of 15 to 25 in fixed orthodontic treatment at the study site were included in this study. However, only those patients who were still receiving active treatment and can provide informed consent was included in the study.

Exclusion Criteria: Participants characterized by syndromes, craniofacial deformities, systemic medical conditions along with patients receiving removable appliance therapy and who have undergone orthodontic treatment from other institute, or any patient treated in the context of orthognathic surgery were excluded to maintain a uniform treatment protocol to avoid confounding factors.

Methods

After obtaining ethical clearance by the Institutional Review Board (LUMHS/REC/-197) and consent from participants, data was collected through a structured pre-

validated questionnaire. The researcher-designed structured questionnaire has three sections which include Pain Perception, Personality Traits and Attitudes toward Orthodontic Treatment, Pain Perception being assessed by a Visual Analogue Scale (VAS), where 0 was no pain, mild (1–3), moderate (4–6), severe (7–8), and worst (9–10). The personality traits was summarized using the NEO-Five Factor Inventory (NEO-FFI) Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. Attitude was evaluated using a Likert-scale-based section, with scores ≥50% considered positive. All questionnaires was self-administered under supervision to ensure clarity and completeness. Demographic details was also recorded. Data was analyzed using SPSS version 26.0, and descriptive statistics was used alongside stratification and chi-square testing to identify significant associations ($p < 0.05$).

RESULTS

A total of 295 patients undergoing fixed orthodontic treatment at the tertiary care hospital in Jamshoro participated in this study. The age range of participants was between 15 to 25 years, with a mean age of 20.1 ± 2.8 years. Out of the total, 168 (57%) were females and 127 (43%) were males. The majority of the participants (64.1%) resided in urban areas, while 35.9% were from rural settings.

Table 1

Demographic Characteristics of Study Participants (n=295)

Variable	Frequency (n)	Percentage (%)
Gender		
- Male	127	43.0
- Female	168	57.0
Age Group (Years)		
- 15–19	132	44.7
- 20–25	163	55.3
Residence		
- Urban	189	64.1
- Rural	106	35.9

Pain perception, assessed using the Visual Analogue Scale (VAS), showed varying levels among patients. Moderate pain was the most frequently reported category, with 137 participants (46.4%). This was followed by mild pain in 83 participants (28.1%), severe pain in 51 participants (17.3%), and worst pain in 12 participants (4.1%). Only 12 patients (4.1%) reported no pain at all.

Table 2

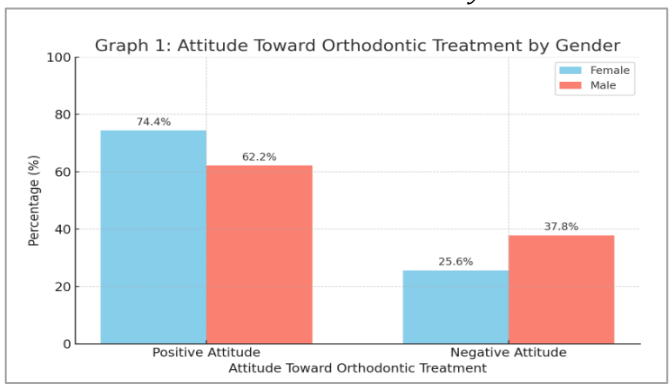
Distribution of Pain Perception Among Participants (VAS Score)

Pain Level	VAS Score Range	Frequency (n)	Percentage (%)
No Pain	0	12	4.1
Mild	1–3	83	28.1
Moderate	4–6	137	46.4
Severe	7–8	51	17.3
Worst	9–10	12	4.1

Regarding attitude toward orthodontic treatment, 204 participants (69.2%) showed a positive attitude based on a total Likert-scale score ≥50%, while 91 participants (30.8%) were classified as having a negative attitude (<50%). Female participants were more likely to have a positive attitude (74.4%) compared to males (62.2%).

Graph 1

Attitude Toward Orthodontic Treatment by Gender



The NEO-Five Factor Inventory revealed that 97 patients (32.9%) had an overall "Excellent" personality profile (low neuroticism and high in other positive traits), while 111 (37.6%) were categorized as "Good." A total of 57 (19.3%) were classified as "Fair," and 30 (10.2%) had a "Poor" personality trait distribution.

Table 3

Distribution of Personality Traits Among Participants

Personality Profile	Frequency (n)	Percentage (%)
Excellent	97	32.9
Good	111	37.6
Fair	57	19.3
Poor	30	10.2

Cross-tabulation revealed a significant association between personality traits and pain perception ($p < 0.05$). Patients with excellent and good personality traits tended to report mild to moderate pain, while those with poor personality traits more frequently reported severe or worst pain. Similarly, a strong correlation was observed between personality traits and treatment attitude. Among patients with excellent personality traits, 93.8% displayed a positive attitude toward treatment, while only 36.7% of those with poor traits had a positive attitude. Further analysis demonstrated that age group and residence did not significantly affect pain perception, but gender showed a weak correlation, with females reporting slightly higher pain scores on average. However, this was not statistically significant ($p > 0.05$).

DISCUSSION

The aim of study to explore the relationship between pain perception, personality traits, and attitude toward orthodontic treatment among patients undergoing fixed orthodontic therapy at a tertiary care hospital in Jamshoro. The findings revealed substantial associations between psychological and physiological domains, highlighting the importance of considering individual psychological characteristics in the planning and execution of orthodontic care. Pain is a prevalent and expected aspect of orthodontic treatment, often presenting in the beginning and during the adjustment phase. The findings indicate the majority of participants reported a moderate degree of pain, aligning with existing literature that states 90% to 95% of patients undergoing orthodontic treatment reports pain (1). Previous literature highlights that pain perception is not experienced uniformly and can differ greatly due to individual characteristics such as pain

threshold, coping strategies, and psychological make-up (2).

The findings support this claim, as neuroticism was related to increased pain in this group, which is consistent with prior studies concentrating on the role of neuroticism as an important predictor of increased pain sensitivity (3). The ability of personality characteristics to shape the orthodontic experience can be understood. In this study, the NEO-Five Factor Inventory (NEO-FFI) was used to evaluate personality facets, where personality characteristics of patients influence reported pain levels and attitudes towards the treatment. This supports the Lorek et al. study, who noted personality traits, such as extraversion and conscientiousness, were associated with better adaptation and lower pain reporting during orthodontic treatment (4). This study also documented that individuals with increased neuroticism and lower facet scores in agreeableness and conscientiousness had worse treatment experiences. This aligns with Nicita et al., who reported matched outcomes in a systematic review (3).

Another important aspect of this study was assessing patient's attitude towards orthodontic treatment. Approximately 69.2 % of the participants expressed a positive attitude, which is a marked percentage and implies growing awareness and acceptance toward orthodontic treatment. It is important to note that Mok et al. indicated that patients having more information and supportive attitudes were related to compliance pertaining to treatment protocols (4). It was also interesting to find that females had a slightly higher rate of positive attitudes than males, which is also congruent with past studies showing differences between males and females in motivation and satisfaction concerning orthodontic care (5). Additionally, younger participants (aged 15–19) were more enthusiastic and cooperative, which is in agreement with Pavlić et al., who have highlighted the importance of age in shaping compliance and perception of treatment (5). Providing patients with detailed information about the treatment process, expected discomfort, and management strategies plays a crucial role in modulating their pain perception and compliance.

Research by Mathew et al. demonstrated that pre-treatment counselling reduced anxiety and improved cooperation, which mirrors the present study's findings that individuals with informed and positive mindsets reported lower discomfort (6). Furthermore, personality traits not only influence pain perception but also affect motivation, compliance, and long-term satisfaction. Otuyemi et al. reported that adolescents with high self-discipline and motivation showed greater adherence to treatment regimens, which again supports the need to identify patient's personality during evaluation (7). Attitude, as a cognitive-affective construct, affects how individuals perceive the usefulness and acceptability of treatment. A majority of participants with a favorable personality profile demonstrated a positive attitude toward treatment, reinforcing the assertion that internal psychological predispositions influence behavioral compliance (8).

The interplay between self-perception, functional expectations, and personality traits also plays a vital role in determining treatment outcomes. Studies by Jessica et al. noted that individuals with a positive self-concept were more likely to adhere to orthodontic treatments (8). Pain perception during dental procedures is strongly linked to psychological states such as anxiety, depression, and past traumatic experiences. Khademi et al. found that patients with high psychological distress showed amplified pain responses during endodontic treatment, as we see in orthodontic practice (9). Similarly, the data showed participants with poor personality typologies were more likely to experience more severe or worse pain. The emotional amplification of physical pain has been previously explored by Hafiz et al. (10). Beyond psychosocial characteristics, patient expectations, motivation, and psychosocial background are important contributing factors to treatment satisfaction and adherence to treatment (11).

In this study, strong co-occurrence rates of high conscientiousness and treatment adherence were reported, which supports personality as an important factor in clinical success. In addition, socioeconomic history and understanding of accessibility and barriers shape treatment attitudes (12). Although not the primary focus of this study, these social determinants could change how participants psychologically responded to treatment. Similarly, pain measurement is variable across the methods. Using varied numerical generators is important, as Karobari et al. noted (13). In this study, the Visual Analogue Scale (VAS) provided a dependable, quantifiable way to assess pain subjectively. This allows us to quantify and rule out relationships with psychological traits, for instance conscientiousness was significantly correlated with VAS scores. The cultural and motivational facts must be taken into consideration. Almasi et al. reported many problems with motivation and compliance between populations due to cultural norms and the perceived expectation of treatment (14).

Interestingly, evidence from other fields including ophthalmology, supports the influence of personality on pain perception. For instance, Bazzazi et al. found that neuroticism was positively related to the amount of post-operative pain following refractive surgery, which establishes a link between personality and pain across disciplines (15). This reinforces orthodontists should include psychological assessment in their treatment planning. Finally, orthodontic treatment is a lengthy, need sustained period of motivation. The psychological fortitude of the individual, shaped by personality and their early relationships with the clinician determines the outcome. Furthermore, Karobari et al. demonstrated that strategies for pain management and selection of testing tools affect patient experience (16).

CONCLUSION

This research demonstrates the importance of personality traits and patient attitudes in their perception of pain in orthodontic treatment. The evidence indicates that patients with favourable personality traits, such as low neuroticism, high conscientiousness, extraversion, and agreeableness, had lower pain perception and a more

positive attitude towards treatment compliance and satisfaction. Whereas patients with unfavourable personality traits report a proportionately high pain perception and negative attitudes toward treatment. They have a direct effect on patient compliance, satisfaction, and treatment outcomes. The study also suggests the importance of personality trait assessments and adequate counselling before treatment to alleviate pain-related worries and engender cooperation. Psychosocial assessments can help orthodontists create or build on multiple communication and management strategies to improve experiences for patients and enhance the patient experience overall. For clinicians to have access to psychosocial considerations on emotional evaluations, a holistic patient-centered approach is vital to the success of orthodontic management when psychosocial and emotional evaluations allow for a more decisive treatment approach, which is the case with different clinical patients having different personalities and attitudes in the orthodontic clinical setting.

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