

Knowledge, Attitude, and Pain Perception of Patient toward Orthodontic Treatment: A Questionnaire Survey

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Abstract:

Background: Orthodontic treatment involves alignment of teeth and correction of jaw irregularity. Pain and discomfort are common problems observed during orthodontic procedure. The present study was done to evaluate knowledge, attitude, and pain perception of patient toward orthodontic treatment: A questionnaire survey.

Materials and Methods: Questionnaire based cross-sectional study was conducted on 200 patients with Group I: 100 treated (50 male and 50 female) and Group II: 100 untreated groups (50 male and 50 female) aged 14-18 years. The questionnaire includes for assessment of patient knowledge, attitude, and pain perception toward orthodontic treatment.

Results: Majority of treated patients compared to untreated had knowledge about orthodontic procedure. Pain perception was experienced by the majority of patients during orthodontic treatment. Pain perception toward orthodontic treatment was more in female (4.78 ± 1.66 and 3.79 ± 1.24 in treated and untreated case, respectively) than male (4.38 ± 1.60 and 3.69 ± 1.11 , respectively, in treated and untreated) subjects. Attitude toward orthodontic treatment was more in female (3.91 ± 1.65 and 2.59 ± 1.62 , respectively) than male (3.65 ± 1.72 and 2.48 ± 1.41 , respectively) in treated and untreated cases.

Conclusions: Knowledge and attitude of patients toward treatment was satisfactory. Pain perception was experience by the majority of patients.

Key Words: Attitude, knowledge, orthodontic, pain

Introduction

Beauty lies on the eyes of the beholder. Well-aligned teeth improve the facial esthetic and self-confidence of a person.

Malaligned teeth often result into food lodgment esthetic and psychological problems in patients. Effective management of orthodontic patient involves clinician's skill, patient's knowledge, motivation, cooperation, and attitude toward treatment.¹ Various reports have shown that age and gender of subjects were correlated with attitude toward orthodontic treatment. Females that to younger one has more desire for orthodontic treatment than males.² Pain and discomfort to the patient are more common during orthodontic treatment. The main cause of pain during this procedure is the application of forces to induce tooth movement, separator placement, and during debonding. Pain during orthodontic treatment is generally categorized as mild and short duration. Pain is influenced by gender, personality factors, individual pain threshold, magnitude of force applied, and motivation. It has been found that well-informed patients has lesser pain perception and require fewer medications.^{1,2}

The aim of this study was to evaluate knowledge, attitude, and pain perception of the patient toward orthodontic treatment by questionnaire survey.

Materials and Methods

Before starting up of the study, a brief explanation about the purpose of study and clarification of included some questions were given to subjects. Inform consent of all participating subject was obtained. The subjects were patients currently undergoing for orthodontic procedure or in retention stage to participate in the study. Syndromic patients, treatment done in other centers, cases treated with removable appliances, and orthognathic cases were excluded from the study. All investigation was done by trained single investigator.

The questionnaire based cross-sectional study was conducted on 200 patients with Group I: 100 treated (50 male and 50 female) and Group II: 100 untreated groups (50 male and 50 female) aged 14-18 years. The instrument for data collection for this study was a bilingual questionnaire (Kannada and English) with agree or disagree response. The questionnaire was relevant to (Appendix I-III) demographic profile and assessment of patient knowledge, attitude, and pain perception toward orthodontic treatment. For evaluation of knowledge and attitude set of 5 questions for each, and pre-evaluated from previous study were included. For pain perception evaluation, set of 8 questions were included.^{1,3}

Patient's personality profile and trait were assessed using neuroticism (N), extraversion (E), openness (O), agreeableness (A), and conscientiousness (C). Pain experience for treated and pain expectation for untreated groups were assessed using a visual analog scale (VAS) based on a line marked at 10 mm intervals whose ends are anchored and defined with verbal descriptors such as "extremely likely" and "extremely unlikely." Eight questionnaires were included to assess pain perception (Appendix III). Each patient was asked to place a mark on the nearest to his/her expectation or experience. The scores for eight questions were averaged to get one score referred to as the average pain perception score. On VAS line, lowest score indicates pain experience/expectation and highest score indicates more pain experience/expectation due to orthodontic treatment.

Five questions to evaluate attitude toward orthodontic treatment (Appendix II) was included. All subjects were asked to answer to questions agree or disagree. Collected data were statistically evaluated using statistical software version 15 (MINITAB Inc., Pennsylvania, USA) and paired *t*-test, Tukey's test.

Results

Table 1 presents a comparison of age, sex, pain perception, and attitude of patient with orthodontic treatment. In treated cases, the mean age range was 16.07 ± 1.25 . In untreated cases, the mean age range was 16.01 ± 1.13 . Pain perception toward orthodontic treatment was comparatively more in female (4.78 ± 1.66 and 3.79 ± 1.24 in treated and untreated case, respectively) than male (4.38 ± 1.60 and 3.69 ± 1.11 , respectively, in treated and untreated) subjects. Attitude toward orthodontic treatment was more in female (3.91 ± 1.65 and 2.59 ± 1.62 , respectively) than male (3.65 ± 1.72 and 2.48 ± 1.41 , respectively) in treated and untreated cases.

Table 2 presents the role of knowledge about orthodontic treatment. Compared to untreated subjects and treated subjects have comparatively better orthodontic knowledge. Treated subjects were well aware that braces were used to correct jaw irregularity, orthodontic treatment takes longer duration for correction, it improves esthetic, and it is comparatively affordable.

Table 3 presents the role of attitude toward orthodontic treatment. 95% treated cases agree with respect to diet modification required over 70% in untreated and 95% subjects agree for oral hygiene necessity during orthodontic

treatment compared to 72% in untreated cases. 90% and 80% of treated cases were satisfied with orthodontic treatment and information given to them, respectively. We observed better attitude in treated cases compared to untreated one.

Table 4 presents the role of personality traits on pain perception. Pain perception was evaluated in the following category; neuroticism, extraversion, openness, agreeableness, and conscientiousness. Pain perception was classified accordingly degree of severity from very high level (VH), very low level (VL), average (A), low level (L), and high level (H). There was statistically significant difference ($P = 0.01$) in pain perception for various levels of the trait neuroticism (Table 4). Tukey's test when used to compare the difference of pain perception among various individual levels; statistically significant difference in pain perception was observed between high level (H) of neuroticism and low level (L) of neuroticism ($P = 0.005$). Neuroticism has shown definite effect on pain perception, which is higher, the level of neuroticism more was the pain perception.

Discussion

Effective and efficient delivery of orthodontic service depends on clinician's skill and patient's knowledge, attitude, and personality toward orthodontic treatment. Hence, this study was undertaken to evaluate patient's knowledge, attitude, and pain perception toward orthodontic treatment. This study helps to deliver efficient orthodontic treatment and to improve patient satisfaction.

Table 1 presents the comparison of age, sex, pain perception, and attitude of patient with orthodontic treatment. In treated cases, the mean age range was 16.07 ± 1.25 . In untreated cases, the mean age range was 16.01 ± 1.13 . Pain perception toward orthodontic treatment was more in female (4.78 ± 1.66 and 3.79 ± 1.24 in treated and untreated case, respectively) compared to male (4.38 ± 1.60 and 3.69 ± 1.11 , respectively, in treated and untreated) subjects. Some studies shown greater pain in female compared to male.^{2,4} However, no difference in pain perception between genders was observed by other researchers.^{1,5-7}

Attitude toward orthodontic treatment was more in female (3.91 ± 1.65 and 2.59 ± 1.62 , respectively) than male (3.65 ± 1.72 and 2.48 ± 1.41 , respectively) in treated and untreated cases (Table 1). These values are in correlation to study by Kadu *et al.*¹ Firestone *et al.*^{2,8}

Table 1: Comparison of age, sex, pain perception, and attitude of patient with orthodontic treatment.

Variables	Treated cases			P	Untreated cases			P
	Male (n=50)	Female (n=50)	Total (n=100)		Male (n=50)	Female (n=50)	Total (n=100)	
Age	16.18±1.25	15.96±1.25	16.07±1.25	-	16.11±1.06	15.92±1.21	16.01±1.13	-
Pain perception	4.38±1.60	4.78±1.72	4.58±1.66	0.24	3.69±1.11	3.79±1.24	3.74±1.17	0.21
Attitude	3.65±1.72	3.91±1.65	3.78±1.68	0.56	2.48±1.41	2.59±1.62	2.53±1.51	0.71

Table 2: Role of knowledge about orthodontic treatment.

Knowledge	n=100 (%)	
	Treated cases	Untreated cases
Braces correct teeth and jaw irregularities		
Agree	98	92
Disagree	02	08
Orthodontic treatment takes longer duration		
Agree	68	70
Disagree	32	30
Incomplete orthodontic treatment worsen the problem		
Agree	90	80
Disagree	10	20
Orthodontic treatment is helpful in improving esthetic appearance		
Agree	98	74
Disagree	02	26
Orthodontic procedure is expensive		
Agree	45	52
Disagree	55	48

Table 3: Role of attitude toward orthodontic treatment.

Attitude towards orthodontic treatment	n (%)	
	Treated case	Untreated case
Diet modification is required after placing braces		
Agree	95	70
Disagree	05	30
Oral hygiene care is must during orthodontic procedure		
Agree	95	72
Disagree	05	28
Do you feel embracing after brasses placement?		
Agree	85	68
Disagree	15	32
Do you satisfied with your orthodontic treatment?		
Agree	90	70
Disagree	10	30
Does your orthodontist explained about orthodontic procedure satisfactorily?		
Agree	80	70
Disagree	20	30

Table 4: Role of personality traits on pain perception.

Traits	Pain perception levels					P
	VL	L	A	H	VH	
Neuroticism	-	3.41	4.02	4.17	4.70	0.008
Extraversion	5.08	4.38	4.01	3.72	3.58	0.068
Openness	4.11	4.22	3.92	4.11	2.67	0.304
Agreeableness	4.33	4.04	3.77	3.78	1.55	0.089
Conscientiousness	4.49	3.93	3.94	3.68	2.1	0.024

VH: Very high level, VL: Very low level, A: Average, L: Low level, H: High level

Patient knowledge and attitude toward orthodontic treatment are important for successful orthodontic treatment. In this study, treated cases have better knowledge and attitude compared to untreated cases because of experience/exposure to orthodontic services. Table 2 presents the role of knowledge

about orthodontic treatment. Compared to untreated subjects and treated subjects have comparatively better orthodontic knowledge. Treated subjects were well aware that braces were used to correct jaw irregularity, orthodontic treatment takes longer duration for correction, it improves esthetic, and it is comparatively affordable. This is in accordance to Shrestha *et al.*³

Table 3 presents the role of attitude toward orthodontic treatment. Attitude toward orthodontic treatment was more in treated cases compared to untreated case. 95% treated cases agree with respect to diet modification required over 70% in untreated and 95% subjects agree for oral hygiene necessity during orthodontic treatment compared to 72% in untreated cases. 90% and 80% of treated cases were satisfied with orthodontic treatment and information given to them, respectively. Our results are in accordance to study by Shrestha *et al.*^{1,3,9-11} Burns concluded that the orthodontic patient's cooperativeness or non-cooperativeness during treatment was not related to the treatment but relevant to manifestation of his/her personality.¹²

Table 4 presents the role of personality traits on pain perception. Pain perception was evaluated in the following category; neuroticism, extraversion, openness, agreeableness, and conscientiousness. Pain perception was classified accordingly degree of severity from very high level (VH), very low level (VL), average (A), low level (L), and high level (H). There was statistically significant difference ($P = 0.01$) in pain perception for various levels of the trait neuroticism (Table 4). Tukey's test when used to compare the difference of pain perception among various individual levels; statistically significant difference in pain perception was observed between high level (H) of neuroticism and low level (L) of neuroticism ($P = 0.005$). Neuroticism has shown definite effect on pain perception, which is higher, the level of neuroticism more was the pain perception. Our values are in accordance to Kadu *et al.*¹ Abu Alhaija *et al.*² Zhang *et al.* concluded that treatment had a positive effect on pain perception and less pain and discomfort in treated patients.¹³

Patients who were positively motivated had lesser pain compared to non-motivated one. It has been observed that pain following orthodontic treatment decreases over a period of 1 month.^{2,14,15} We observed that motivated patient had lesser pain that is in accordance to Kavaliauskiene *et al.*¹⁶, but Tauheed and Shaikh concluded that higher motivation to seek orthodontic treatment does not affect the perception of pain.⁶ Campos and Vitral concluded that pain perception was more in patients who had more uneven teeth.¹⁷ Al-Zubair observed that lack of knowledge and fear of pain might be the reason for not getting orthodontic treatment.¹⁸ Several researches have indicated that patients may adapt to continuous pain with the progression of treatment as the sensations ceases.^{5,16,19,20}

The majority of female compared to male had knowledge about orthodontic procedure. Pain perception was experienced by the majority of patients during orthodontic treatment. It was more in females compared to male.

Conclusion

Knowledge and attitude of patients toward treatment was satisfactory. Pain perception was experienced by the majority of patients.

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Appendix: Evaluation Questions

Appendix I: Evaluation for knowledge about orthodontic treatment

1. Braces correct teeth and jaw irregularities
2. Orthodontic treatment takes longer duration
3. Incomplete orthodontic treatment worsen the problem
4. Orthodontic treatment is helpful in improving esthetic appearance
5. Orthodontic procedure is expensive.

Appendix II: Evaluation questions for patient attitude toward orthodontic treatment

1. Diet modification is required after placing braces
2. Oral hygiene care is must during orthodontic procedure
3. Do you feel embracing after brasses placement?
4. Do you satisfied with your orthodontic treatment?
5. Does your orthodontist explained about orthodontic procedure satisfactorily?

Appendix III: Evaluation questions for pain perception or expectation in treated and untreated cases

1. Does separator placement between teeth was painful?
2. Does band placement was painful?
3. Does bracket placement was painful?
4. Does arch wire placement was painful?
5. Does wearing of orthodontic elastic was painful?
6. Does wearing extraoral appliance was painful?
7. Does wearing orthodontic retainer appliance was painful?
8. Does bracket debonding was painful?