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Original Article

Correlation of Behavioral Attributes of Post Graduate Residents with the Compliance of Patients Undergoing Orthodontic Treatment

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ABSTRACT

Objective: To correlate patients perceived behavioral attributes of postgraduate residents to the assessed compliance status of the patients undergoing orthodontic treatment.

Study Design: Analytical cross-sectional.

Place and Duration of the Study: Department of Orthodontics, University College of Dentistry, The University of Lahore, Nov 2022 to Feb 2023.

Methodology: The study comprised 215 orthodontic patients, who completed the pre-validated standardized proformas about the behavioral attributes of their treating postgraduate residents, comprising 25 questions based on 5-point Likert scale. The respective postgraduate residents assessed the patients' compliance based on the Orthodontic Patient Cooperation Scale (OPCS) where postgraduate residents and their patients were blind to each other's responses. The age range of the patients was 12-29 years with mean age being 18.84±4.03 years. Non-probability convenience sampling technique was used.

Results: A moderate positive correlation was noted between the behavior of the resident explaining the procedure step by step (Item 17) and the average patients' compliance score (r=0.47, p<0.001). A mild positive correlation was present for the behavior of postgraduate residents, warning the patient if the procedure hurts (Item 1, r=0.28, p<0.001), being polite (Item 9, r=0.24, p<0.001) and punctual (Item 25, r=0.19, p=0.01) with favorable compliance of patients.

Conclusion: Behavioral attributes of postgraduate residents positively correlate with the compliance of patients undergoing orthodontic treatment. Clinicians' behavior and step-by-step explanations, counseling of the patients for painful procedures, politeness in conversation and punctuality may lead to improved patient compliance score.

Keywords: Behavior, Doctors' attributes, Orthodontic motivation, Patient compliance.

How to Cite This Article: *Imtiaz A, Qamar CR, Majid MA, Nasir K, Nayyab T. Correlation of Behavioral Attributes of Post Graduate Residents with the Compliance of Patients Undergoing Orthodontic Treatmen. Pak Armed Forces Med J 2025; 75(6): 1146-1149.*
DOI: https://doi.org/10.51253/pafmj.v75i6.11648

INTRODUCTION

Orthodontic treatment is a long duration treatment that requires patients' adherence to various regimens as instructed by their orthodontists,[1] where the success of treatment depends on several factors, including patient's motivation and cooperation.[2] Literature has defined patients' compliance as the extent to which a person's behavior follows the clinician's advice.[3] Orthodontic compliance can lead to successful treatment outcomes in shorter duration, minimizing deleterious effects.[4] The patients' cooperation is also a determinant factor of patient satisfaction with orthodontic results.[5] Compliance can be affected due to various factors, including the patient's personality traits and attitudes, along with orthodontists' behavior.[6] The fifth dimension of the doctor-patient relationship framework, "Doctor as Person", emphasizes the effect of physician's personality traits and behavioral aspects on the informed decisions opted by the patients and their cooperation during long term treatments.[7] Inconsistent results regarding the influence of clinicians' behavior on patient cooperation have been noted in literature.[8,9] A systematic review reported that patient cooperation is affected by the doctor's behavioral conduct.[8] On the contrary, another study concluded that no significant correlation exists between compliance of the patient and orthodontist-patient relationship.[9] The objective of this study was to correlate the behavioral attributes of postgraduate residents with the compliance of patients undergoing Orthodontic treatment. The outcome of this research can help in the identification of pragmatic behavioral approaches required by postgraduate residents to reshape their attitudes, leading to improved patient cooperation.

METHODOLOGY

This analytical cross-sectional study was carried out on 215 consenting patients, undergoing orthodontic treatment at University College of

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Received: 16 Feb 2024; revision received: 26 Jul 2024; accepted: 29 Jul 2024

Dentistry, The University of Lahore. The study was approved by the Ethics Review Committee with reference ABC/ERCA/13001, dated 21 October 2022. A sample size of 215 participants was calculated using the World Health Organization (WHO) calculator, considering an expected correlation of 0.19 between orthodontists' behavioral trait and patients' cooperation scores from literature.[10]

Inclusion Criteria: Patients belonging to either gender, undergoing orthodontic treatment with an age range of 12-29 years.

Exclusion Criteria: Patients undergoing retreatment due to relapse or having any physical or mental disability.

Questionnaires were distributed to patients and orthodontic residents after obtaining informed consent. In order to maximize internal validity, the two groups of respondents were blind to each other's responses. The questionnaire included 24 items 10, with Item 25 added according to local context from the comments obtained after conducting a pilot study. The score was assessed on a 5-point Likert scale, ranging from Strongly Disagree to Strongly Agree where 1 represents Strongly Disagree while 5 represents Strongly Agree. Overall behavior score was calculated as average score obtained from Item 1 to Item 25. Each attribute was also considered as variable for the analysis. The treating orthodontic residents completed the Orthodontic Patient Cooperation scale (OPCS),[11] which consisted of 10 questions on 4 point Likert scale with categories, Always, Sometimes, Usually and Never, scored as 1 to 4, respectively. The final compliance score of the patients was noted by adding the scores obtained from all the questions, ranging between 10 (Lowest cooperation) to 40 (Highest cooperation). Data entry and analysis were done using Statistical Package for Social Sciences (SPSS) version 25. Quantitative variables were presented as Mean±SD, normality of data was assessed with Kolmogorov-Smirnoff test. As the data was not normally distributed, difference in OPCS mean rank score between genders was analyzed using Kruskal Wallis H test was used to assess the mean ranks of OPCS scores with reference to educational status and treatment duration. As the group in the educational status with no formal education was represented by 3 patients only, it was filtered out to strengthen the reliability of Kruskal Wallis H test. Spearman's correlation coefficient was utilized to assess the correlation between behavioral attributes of orthodontic residents and patient's compliance score where a *p*-value of ≤0.05 was considered as significant.

RESULTS

The sample consisted of 215 patients, with 70(32.6%) males and 145(67.4%) females and mean age being 18.84±4.03 years, with a range being 12-29 years. The mean orthodontic patient compliance score was 32.8±7.13, ranging from 10-40, median OPCS score for males and females was 34(IQR=27-38) and 35(IQR=31-39) respectively but there was no statistically significant difference in the OPCS score with reference to gender (p=0.09). The distribution of educational status and overall treatment duration is presented in Table-I, where statistically significant correlation was observed between overall behavioral attributes score of clinicians and compliance of patients (r=0.16, p=0.02).

Table-I: Comparison of Patients' Compliance Score with Educational Status and Treatment Duration, (n=215)

Variables		n(%)	OPCS score Median (IQR)	*p*-value (≤0.05)
Education	School level	43(20%)	36(32-39)	0.180
	College level	65(30.2%)	33(25-38)	
	University level	104(48.4%)	34(30-38)	
Treatment Duration	1-6 months	40(18.6%)	35(31-38)	0.255
	7-12 months	42(19.5%)	34(28-36)	
	13-18 months	45(20.9%)	36(30-38)	
	19-24 months	39(18.1%)	33(26-39)	
	>24 months	49(22.8%)	36(31-39)	

OPCS: Orthodontic Patient Cooperation Scale

A moderate positive correlation was present between better compliance score of the patients and behavior of the postgraduate resident, explaining the procedure step by step (Item 17, r=0.47, p<0.001). Mild positive correlation was observed for items related to warning the patients if the procedure hurts (Item 1, r=0.28, p<0.001), working quickly but not rushing (Item 5, r=0.16,p=0.02), being polite (Item 9, r=0.24,p<0.001)and punctuality (Item 25, r=0.19,p=0.01) of the postgraduate residents with the favorable compliance of the patients as shown in Table-II.

DISCUSSION

The present study highlights the importance of the clinicians' behavioral aspects in achieving optimal patient compliance. Compliance is an essentially required component for the successful outcome of orthodontic treatment.[12] The present literature reported various factors involved under the term compliance among orthodontic patients.[13,14] Subjective

Table II: Correlation of Patient's Compliance Score with the Behavioral Attributes of Concerned Postgraduate Residents, (n=215)

Behavioral attributes	Patients' compliance score	
	r-value†	*p*-value
Overall behavior score	0.16*	0.02
1. Warned me if the procedure might hurt.	0.28**	<0.001
2. asked me to be calm or to relax.	0.02	0.73
3. Criticized my teeth or how I have been taking care of them.	-0.01	0.91
4. Showed that he/she understands what I was feeling.	0.04	0.53
5. Worked quickly but didn't rush.	0.16*	0.02
6. Was friendly to me.	-0.04	0.60
7. Encouraged me to ask questions about my treatment.	-0.01	0.91
8. Made me feel welcome.	0.04	0.61
9. Was polite to me during my visit.	0.24**	<0.001
10. Used understandable words about my treatment.	0.03	0.67
11. Told me what he/she was going to do before starting to work.	0.06	0.42
12. Showed me that he/she paid attention to what I said.	0.02	0.80
13. Reassured me during the procedure.	0.03	0.66
14. Asked during the procedure if I was having any discomfort.	0.04	0.61
15. Had a calm manner.	0.06	0.38
16. Asked during the visits if I were concerned or nervous.	0.05	0.47
17. A step-by-step explanation of what he/she was doing.	0.47**	<0.001
18. Showed that he/she took seriously what I had to say.	0.01	0.97
19. Was patient with me.	0.05	0.49
20. Carried out casual conversation and small talk.	0.04	0.55
21. Told me that if it started to hurt he/she would relieve the pain.	-0.03	0.67
22. Gave me moral support during the procedure.	0.05	0.50
23. He/she would do everything he/she could do to prevent pain.	-0.01	0.95
24. Welcome me with a smile during my visit.	-0.02	0.83
25. Was punctual regarding the timing of my appointments.	0.19*	0.01

*† Spearman's correlation Coefficient. ** p<0.001. *p<0.05*

assessment of compliance is amenable to bias as it can reflect the relationship of the clinician with their patients.[15] Several scales have been devised to measure patients' compliance objectively,[16,17] with the Orthodontic Patient Cooperation scale covering multifactorial compliance issues.[10] Mean compliance score of the patients was 32.8±7.13 in our study, inconsistent with the mean OPCS score (22.21±4.28) reported in a previous study.[18] The contrasting results should be compared with caution as the latter study included patients with Class III malocclusion only. The present findings revealed no significant mean difference of patients' compliance score with regards to gender differences (p=0.092), similar to another study,[19] however, one author reported better average compliance scores of female patients.[20] Treatment adherence of orthodontic patients was significantly correlated with the duration of treatment, in one study,[21] but the findings of this study determined that no significant mean rank OPCS score difference (p=0.26) existed between patient cooperation and duration of the treatment. Patient compliance was significantly correlated with the prior knowledge about the procedures, consistent with a previous study,[22] while another study emphasized that effective communication through clear and concise instructions improves patient compliance,[23] particularly verbal and nonverbal communication modes to decrease the nocebo effect.[24] Positive treatment adherence of orthodontic patients can be achieved by the empathetic and caring attitude of the orthodontists,25 similar to our findings.

LIMITATIONS OF STUDY

The study reflected the responses of orthodontic residents currently enrolled in the postgraduate Orthodontic programs of University College of Dentistry, Lahore, therefore the results may not be generalizable to consultant orthodontists. The data was collected at a single point in time. Longitudinal data collection over different time intervals during treatment might give better insight about the changing trends in the cooperation scale of patients.

CONCLUSION

Behavioral attributes of postgraduate residents positively affect the compliance of patients undergoing orthodontic treatment as there was no significant correlation between the orthodontic treatment duration and patient compliance. Behavioral attributes such as preoperative informational care about painful procedures, politeness, and punctuality were also correlated with patient's adherence to the treatment instructions.

Conflict of Interest: None.

Funding Source: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

AI & CRQ: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

MAM & KN: Conception, data analysis, drafting the manuscript, approval of the final version to be published.

TN: Data acquisition, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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