

Knowledge, Awareness, and Attitude of Malocclusion and Behavior toward Orthodontic Treatment among Medical and Paramedical Staff of Central Reserve Police Force, India

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Abstract

Background: Malocclusion not only hampers psychosocial development but also affects appearance, speech, masticatory efficiency, and respiration. Awareness and perception of general population about the problem varies with their geographical location and cultural background, education, and their knowledge. Central Reserve Police Force (CRPF) is the largest paramilitary force of India with its multidimensional role to preserve law and order and to provide internal security. **Objective:** The objective of this study is to evaluate knowledge, attitude, and awareness among medical and paramedical staff of CRPF so as to enhance reference to orthodontist to provide better orthodontic care to force personnel and their dependents. **Materials and Methods:** This was a cross-sectional web-based questionnaire survey conducted among a total of 420 medical and paramedical staff of CRPF of age between 21 and 65 years which were further divided into three age groups. A pre-structured self-administered questionnaire consisting of 27 questions was given to assess their knowledge and attitude toward orthodontic treatment. The statistical analysis was done using the Statistical Package for the Social Sciences SPSS (Chicago 22.0). **Results:** The mean score for knowledge was found to be more for medical professional (16.17 ± 2.97) compared to paramedical (10.69 ± 6.61), and the difference was statistically highly significant ($P = 0.00$). The mean score for awareness score was found to be more in the medical professionals (5.91 ± 1.30) compared to paramedical (4.52 ± 2.26), and the difference was statistically highly significant ($P = 0.00$). **Conclusion:** Knowledge and attitude toward orthodontic treatment is far better in medical staff than paramedical staff but the number of paramedical staff is quite large as compared to medical staff. Hence, it is important to increase awareness among paramedical staff regarding malocclusion and orthodontic treatment.

Keywords: Malocclusion, Orthodontic Treatment, Behavior, Awareness, Knowledge, Central Reserve Police Force, Medical and Paramedical Staff.

INTRODUCTION

The World Health Organization^[1] had included malocclusion under the heading of Handicapping Dentofacial Anomaly. A malocclusion is defined as an irregularity of the teeth or a malrelationship of the dental arches beyond the range of what is accepted as normal.^[2]

An individual's occlusal status is generally described by two major characteristics: Intra-arch relationship (the relationship of the teeth within each arch to a smoothly curving line of occlusion) and interarch relationship (the pattern of occlusal contacts between the upper and lower teeth).^[3] The term "irregularities of teeth" as applied to teeth that were unevenly arranged or rotated, did not express the full meaning of these deformities and hence the term "malocclusion" would be more expressive.^[4]

The grouping of dominant orthodontic problems was carried out as "congenital etiology," "acquired etiology," and "malocclusion."^[5] The congenital etiology group consisted of tooth abnormality, absence of permanent tooth, active frenum, lip incompetent, and other skeleton and soft-tissue abnormality. The acquired etiology group consisted of caries, early loss of primary tooth, prolonged retention of primary tooth, thumb sucking, and complete mouth breathing and tongue thrusting habit. The malocclusion group consisted of increased overjet,

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deep bite, open bite, anterior cross bite, posterior cross bite/scissor bite, tendency of crowding/spacing in permanent dentition, abnormality in the first permanent molar relationship, first permanent molar tipping, first permanent molar rotation, and ectopic eruption of permanent tooth.

This condition is affected by genetic factors, environmental factors, or the combination of both factors. Despite not being a pathological condition, malocclusion has some detrimental effects toward the quality of life, particularly in health and psychosocial aspects.^[6] Some of the psychosocial effects are lack of self-esteem and body image dissatisfaction for those whose malocclusion affects their facial appearance, which possibly cause peer discrimination.^[7] Many studies have found that association of the amount of plaque, calculus, gingivitis, or pocketing was related to various indices of malocclusion.^[8-10]

Awareness is the state or ability to perceive, to feel, or to be conscious. Having a basic awareness regarding oral health is important in planning overall dental treatment. The knowledge, attitude, and awareness of the medical and paramedical professionals regarding orthodontic treatment is crucial when it comes to referring patients to the higher centers for the same.^[11] Central Reserve Police Force (CRPF) is the largest Central Armed Police Force of India. Medical and paramedical staff caters the medical needs of force personnel and their dependents. The present study was conducted to find out the knowledge, attitude, and awareness toward orthodontic treatment among CRPF medical and paramedical staff to enhance the reference for CRPF personnel and their dependents to orthodontist for treatment.

MATERIALS AND METHODS

This present study was a crosssectional webbased questionnaire survey conducted among a total of 420 medical and paramedical staffs of CRPF of age between 21 and 65 years, which were further divided into three groups (20–35 years, 36–50 years, and 51–65 years). A pre-structured self-administered questionnaire consisting of 27 questions was given to assess their knowledge and attitude toward orthodontic treatment. Approval was obtained from Research Advisory Committee of People's Dental Academy, Bhopal.

Statistical analysis

Statistical analysis was carried out using descriptive statistics in the Statistical Package for the Social Sciences (SPSS, v25.0, Inc., Chicago, Illinois). Mean knowledge and awareness of participants were compared using *t*-test and one-way ANOVA test. $P \leq 0.005$ was considered to be statistically significant.

RESULTS

The study sample consisted of 420 subjects of which 122 (29.0%) were medical professionals and 298 (71.0%) were paramedical staff. The distribution of study subjects as based on the level of education among the 420 participants, 77 (18.3%) had completed their postgraduation, 188 (44.8%)

their graduation, and 155 (36.9%) their higher secondary education. Based on age group, 157 (37.4%) participants were in 20–35 years of age group, 215 (51.2%) were from 36 to 50 years, and 48 (11.4%) were between 51 and 65 years of age group (Tables 1 and 2).

The mean score for knowledge regarding orthodontic treatment was found to be more in medical professional (16.17 ± 2.97) compared to paramedical personals (10.69 ± 6.61) and the difference was statistically highly significant ($P = 0.00$) (Table 3). The mean score for awareness about orthodontic therapy was found to be more amongst medical professional (5.91 ± 1.30) compared to paramedical personals (4.52 ± 2.26), and the difference was statistically highly significant ($P = 0.00$) (Table 4).

The mean score for knowledge was more in 20–35 years of age group (12.37 ± 6.30) followed by 36–50 years (12.32 ± 6.39) and least in the 51–65 years (12.04 ± 5.81). However, statistical analysis showed no significant difference in the mean knowledge score to different age groups ($P = 0.950$) (Table 5). The mean score for awareness was found to be more in the 51–65 years of age group (5.27 ± 2.18) followed by 36–50 years (4.90 ± 2.12) and was the least in the 20–35 years (4.87 ± 2.09). However, statistical analysis showed no significant difference in the mean awareness score to different age groups ($P = 0.500$) (Table 6).

DISCUSSION

CRPF is India's largest Central Armed Police Force functioning under the Government of India. Its multidimensional role is to preserve law and order and to provide internal security. Medical cadre of CRPF includes medical, dental, and paramedical staff whose main function is to protect, maintain, and restore the health of the force personnel and their dependents. Medical and paramedical staff generally does health screening and refer the individual to specialist for specific treatment.

Malocclusion is the third most common dental public health condition worldwide, after dental caries and periodontal

Table 1: Frequency distribution of demographic variables of the respondents (n=420)

Demographic characteristics	n (%)
Mean age (mean±SD)	38.18±9.08
Age groups	
20–35 years	157 (37.4%)
36–50 years	215 (51.2%)
>50 years	48 (11.4%)
Education	
Postgraduate	77 (18.3%)
Graduate	188 (44.8%)
High/higher secondary	155 (36.9%)
Profession	
Medical	122 (29.0%)
Paramedical	298 (71.0%)
Total	420 (100%)

SD: Standard deviation, n: Number of subjects

Table 2: Knowledge and awareness of medical and paramedical staff of CRPF towards orthodontic treatment

Knowledge and awareness questions	Responses	
	Yes, n (%)	No, n (%)
Have you heard of the term misalignment of teeth?	311 (74.0%)	109 (26.0%)
Do you think this misalignment is caused due to genetic/hereditary reason?	210 (50.0%)	210 (50.0%)
Do you think this misalignment is due to external habits (thumb sucking/tongue thrusting, lip biting)?	264 (62.9%)	156 (37.1%)
Do you think improper alignment of teeth would affect mastication (chewing problem)?	206 (49.0%)	214 (51.0%)
Do you think improper alignment of teeth could lead to alteration in breathing (mouth breathing habit)?	296 (70.5%)	124 (29.5%)
Do you think that misaligned teeth can affect speech?	255 (60.7%)	165 (39.3%)
In your opinion, is a regular dental checkup and care important for children and adolescents?	323 (76.9%)	97 (23.1%)
In your opinion, does a misaligned tooth arrangement affect your appearance?	310 (73.8%)	110 (26.2%)
In your opinion, does a misaligned tooth arrangement causes difficulty in maintaining good oral hygiene?	292 (69.5%)	128 (30.5%)
Have you ever heard the term braces/orthodontic treatment?	290 (69.0%)	130 (31.0%)
Are you aware that there is a separate specialization in dentistry (orthodontics and dentofacial orthopedics) which focuses on correction of misaligned teeth and jaws treatment?	287 (68.3%)	133 (31.7%)
Are you aware that orthodontist can correct misaligned jaws in growing individuals?	288 (68.6%)	132 (31.4%)
Are you aware that ideally orthodontic treatment should be done by orthodontist (MDS in orthodontics)?	292 (69.5%)	128 (30.5%)
Have you undergone orthodontic treatment?	137 (32.6%)	283 (67.4%)
Do you know that taking proper orthodontic treatment would improve your facial appearance?	292 (69.5%)	128 (30.5%)
Do you know that taking proper orthodontic treatment would improve your health?	310 (73.8%)	110 (26.2%)
Do you know that taking proper orthodontic treatment would improve function?	300 (71.4%)	120 (28.6%)
Are you aware that orthodontic treatment at early age may prevent invasive orthodontic treatment involving surgery at a later age?	293 (69.8%)	127 (30.2%)
In your opinion, does treatment with braces take a long time?	277 (66.0%)	143 (34.0%)
Would you be willing to undergo orthodontic procedure if it takes more than 2 years?	207 (49.3%)	213 (50.7%)
Are you aware that few teeth may have to be removed for proper positioning of irregular teeth?	273 (65.0%)	147 (35.0%)
Do you think orthodontic treatment is a stressful/painful procedure?	194 (46.2%)	226 (53.8%)
Do you think orthodontic procedures are expensive?	274 (65.2%)	146 (34.8%)
Are you aware that the improper teeth can be corrected even after 40 years of age?	222 (52.9%)	198 (47.1%)

(Contd...)

Table 2: (Continued)

Knowledge and awareness questions	Responses	
	Yes, n (%)	No, n (%)
Are you aware that there are different types of braces (metal brackets, ceramic brackets, lingual brackets, aligners, etc.)?	270 (64.3%)	150 (35.7%)
Are you aware that after treatment you need to wear retainers for some time?	258 (61.4%)	162 (38.6%)
Are you aware that not wearing retainers regularly will result in relapse of treatment?	264 (62.9%)	156 (37.1%)

Table 3: Participants mean knowledge score and its association with their profession

Characteristics	Mean knowledge score (Mean±SD)	t-value	P-value
Profession			
Medical	16.17±2.97	t=8.791	0.000*
Paramedical	10.69±6.61		

*Statistically significant, SD: Standard deviation

Table 4: Participants mean awareness score and its association with their profession

Characteristics	Mean awareness score (mean±SD)	t-value	p-value
Profession			
Medical	5.91±1.30	t=6.398	0.000*
Paramedical	4.52±2.26		

*Statistically significant, SD: Standard deviation

Table 5: Participants mean knowledge score and its association with their age group

Characteristics	Mean knowledge score (Mean±SD)	F-value	P-value
Age groups			
20–35 years	12.37±6.30	f=0.52	0.950
36–50 years	12.32±6.39		
>50 years	12.04±5.81		

Table 6: Participants mean awareness score and its association with their age group

Characteristics	Mean awareness score (Mean±SD)	F-value	P-value
Age groups			
20–35 years	4.87±2.09	f=0.69	0.500
36–50 years	4.90±2.12		
>50 years	5.27±2.18		

diseases.^[12,13] It is the second most common dental disorder next to dental caries among children and young adults.

In the present study, 311 (74%) of participants were aware of terminology misalignment/malalignment and 210 (50%)

participants agreed that malalignment are caused due to genetic/hereditary reason.

Dental malocclusion is mainly influenced by the environmental factors, especially due to the individual's habits. Two hundred and sixty-four (62.9%) participants agreed that malalignment is due to external habits (thumb sucking/tongue thrusting and lip biting) and 156 (37.1%) of the participants disagreed on the same. A study by Clement^[14] also observed positive association of 140 (70%) individuals with external habits.

With regard to the effects of malocclusion, 206 (49%) of the participants were aware that improper alignment of teeth would affect mastication (chewing problem), 296 (70.5%) were aware that malalignment would lead to mouth breathing, and 255 (60.7%) agreed that malocclusion can adversely affect the speech. However, in a similar study, Sharma *et al.*^[15] observed low knowledge level among pediatrician in Haryana state and advocated the need for appropriate training and encouragement.

Three hundred and twenty-three (76.9%) of individuals understood that regular dental check-up and care are important for children and adolescents, 310 (73.8%) of participants were aware that malocclusion decreases the esthetics and appearance of individual, and 292 (69.5%) agreed that malocclusion causes difficulty in maintaining good oral hygiene. Mane *et al.*^[16] and Gnaneswara *et al.*^[17] also found that esthetics is the prime concern for seeking orthodontic treatment.

Two hundred and ninety (69%) of participated individual had heard of the term braces/orthodontic treatment and 287 (68.3%) individuals recognized that there is a separate specialization in dentistry (orthodontics and dentofacial orthopedics) which focuses on correction of misaligned teeth and jaws. Two hundred and eighty-eight (68.6%) were aware that orthodontist can correct misaligned jaws in growing individuals. However in a study conducted by Patil *et al.*^[18] among young adults, it was found that there was lack of awareness among adults regarding orthodontic need and that there was lack of satisfaction level regarding the appearance of their teeth.

Two hundred and ninety-two (69.5%) participants recognize that ideally, orthodontic treatment should be done by an orthodontist (MDS in orthodontics) and 137 (32.6%) participants had undergone orthodontic treatment. Two hundred and ninety-two (69.5%) participants concord with the view that taking proper orthodontic treatment would improve facial appearance, overall health (73.8%), and function (71.4%).

Two hundred and ninety-three (69.8%) participants were aware that orthodontic treatment at early age may prevent invasive orthodontic treatment involving surgery at a later age. Mani *et al.*^[19] reported that the vast majority of the parents were aware about functional appliance and they had knowledge about how to distinguish skeletal problem.

Two hundred and seventy-seven (66%) individuals understood that treatment with braces take a long time. In a similar study by Bailwad^[20] among Malaysian population, only 4% of patients thought that the orthodontic treatment has a short treatment duration. Two hundred and seven (49.3%) were willing to undergo orthodontic procedure even though it takes more than 2 years.

Two hundred and seventy-three (65%) individuals were aware that few teeth may have to be extracted for proper positioning of irregular teeth. One hundred and ninety-four (46.2%) individuals considered that orthodontic treatment is a stressful/painful procedure in the present study. Ishfaq *et al.*^[21] assessed stress levels in orthodontic patients receiving treatment for 3 months and found overall stress reduction with time.

Two hundred and seventy-four (65.2%) participants considered orthodontic procedures to be expensive. These results were similar to the earlier study by Sharma *et al.*^[22] in Nepalese population where they have stated that financial restriction was found to be one of the barriers for the patients to undergo orthodontic treatment.

Two hundred and twenty-two (52.9%) individuals had knowledge that the irregular teeth can be corrected even after 40 years of age. Two hundred and seventy (64.3%) individuals were aware that there are different types of braces (metal brackets, ceramic brackets, lingual brackets, aligners, etc.). In a similar survey study done by Khan^[23] among for the preference of type of braces, it was found long treatment duration and unesthetic appearance of metal brackets are the main reasons discouraging adult patients to start orthodontic treatment. Therefore, clear aligners, lingual appliances, and ceramic brackets are most commonly used in adult patients.^[24,25]

Two hundred and fifty-eight (61.4%) individuals were aware that retainers would be required after treatment for some time and 264 (62.9%) individuals knew that not wearing retainers regularly would result in relapse of treatment. Shetty *et al.*^[26] conducted a study for the assessment of knowledge for post-orthodontic retention, it was concluded that although stability of results after orthodontic treatment is very important to people deciding about a prospective orthodontic treatment, knowledge regarding the need for post-orthodontic retention varies.

CONCLUSION

1. The most important factors for not undergoing orthodontic treatment by patients are the lack of awareness and long treatment duration. The findings of the present study confirmed that there is a positive awareness and attitude toward orthodontic treatment among medical and paramedical staff of CPRF but specific misconceptions and barriers exist.

2. Community awareness program for medical and paramedical staff should aim toward improving population's knowledge on dentofacial orthopedic treatments in specific, as per the study findings.

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