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RESEARCH ARTICLE

ORTHODONTIC TREATMENT NEED AMONG SAUDI ARABIA POPULATION IN MAKKAH CITY.

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Key words:-

Malocclusion, orthodontic treatment need, IOTN, public, government, dental health and aesthetic.

Abstract

Aim: To evaluate the asperity of malocclusion and orthodontic treatment need among young Saudi obtain free treatment at government dental practices.

Background: In the present hypothesis, the perceptive need as evaluated by patients and the actual need to orthodontic treatment, as assessed by orthodontists, were evaluated at deferent types of government dental practices in the city of Makkah using the Index of Orthodontic Treatment Need (IOTN).

Methods: A consecutive sample of 400 adults seeking orthodontic treatment at two different types of government dental practices in Makkah, (Free treatment), was examined for orthodontic treatment need using of the IOTN. The self-perceived need for orthodontic treatment was also determined using the aesthetic component (AC) of the IOTN. The IOTN score and the incidence of each variable were calculated statistically.

Results: Supplanting, increased overjet, and Class II and III malocclusion were the virtually common orthodontic issues in this hypothesis. High percent of orthodontically treated patients at Makkah clinics were in great need of treatment ($P=0.003$).

Conclusion: Patient's perception to orthodontic treatment does not always correlate with professional assessment. The IOTN is a valid screening tool that should be used in orthodontic clinics for better services especially, in health centers that provide free treatment.

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Introduction:-

Orthodontic treatment is an elective treatment that depends on the perception of the patient and the treating orthodontist In Saudi Arabia, governmental sectors provide free orthodontic treatment for Saudi citizens². This has generated long waiting lists of patients that can extend for two to four years. Evaluation of self perceived and actual need for orthodontic treatment as well as other factors affecting these needs such as personal, socio-demographic, and psychosocial factors help in planning orthodontic services and estimating the required resources and manpower.⁴

Moreover, unnecessary referrals by general practitioners and lengthy waiting lists for orthodontic treatment can be eliminated by limiting free treatment to patients with malocclusions sever enough to warrant treatment. It may also predict patients' level of interest and motivation toward the orthodontic treatment, which could help in planning educational programs in schools and media to increase patient's awareness and to overcome obstacles and barriers in

seeking treatment. Perceptive or self assessed need to dental care is reported to be associated with certain signs and symptoms, socio-demographic factors and satisfaction with previous dental treatment. Previous studies have shown differences between patients' and professionals' perception on orthodontic treatment need.^{1,7,9}

It seems that normative or actual need as assessed by dental professionals may not be linked to patients' perceptions unless the condition has progressed sufficiently to be symptomatic. Several indices were developed to evaluate malocclusion, such as the IOTN, PAR (Peer Assessment Rating Index) and ICON (Index of Complexity, outcome and Need).^{6,3} The IOTN and the ICON can serve as neutral instruments to determine treatment needs and to allocate financial resources for orthodontic cases. Although the IOTN and the ICON are similar and largely in agreement in measuring treatment needs of patients from different ethnic backgrounds, the IOTN has been used extensively in literature to evaluate actual and perceptive treatment needs in different ethnic backgrounds and it seems to be a more popular research tool in the Middle East than the ICON. In addition, the IOTN is simpler than the ICON in assessing treatment needs since ICON was designed to measure complexity of treatment in addition to treatment needs.^{11,19}

The IOTN is a scoring system for malocclusion, developed by Brook & Shaw (1989). It consists of two independent components; the DHC, which is a five grade index that records the dental health need for orthodontic treatment, and the AC that records the aesthetic need for orthodontic treatment using a ten grade standardized ranking scale of colored photographs showing different levels of dental attractiveness. In Saudi Arabia, not a single study has been conducted regarding treatment needs among regular orthodontic patients.^{8,14}

The patient's perception, parents' perceptions, and orthodontist's assessment all influence the need for orthodontic treatment in children and adolescents. Several studies have shown that there is no link between actual need for treatment as assessed by orthodontists and perceptive need as evaluated by patients or their parents, unless the condition is symptomatic. With the increased demand for orthodontic treatment, free health services need a quantifiable method of assigning resources. These scale based indices are used to evaluate the severity of malocclusion and orthodontic treatment need. However, each method has its limitations: most treatment need indices do not assess the prognosis of untreated malocclusions and related symptoms, and these indices may need revalidation overtime.^{3,7,10}

Past studies have used various indices to investigate orthodontic treatment need in different populations. The IOTN is most frequently used, especially among researchers in the Middle and Far East. Based on the DHC of the IOTN, a lower percentage of treatment need has been reported among children in Egypt (19.8%),¹⁶ India (21%),¹⁷ Saudi Arabia (22.4%),¹⁸ Kuwait (28%),¹⁹ and Jordan (28%)²⁰ than among Iranian (36.1%),²¹ Turkish (38.8%),²² Pakistani (40%),²³ Malaysian (47.9%),²⁴ and Chinese (52%)²⁵ populations.^{12,15,17}

The objectives of the present study were:

1. To assess the perceptive and actual treatment needs for orthodontic treatment among subjects seeking orthodontic treatment in the city of Makkah using the IOTN.
2. To compare those subjects attending a governmental dental clinic, with those attending PDP utilizing the IOTN.

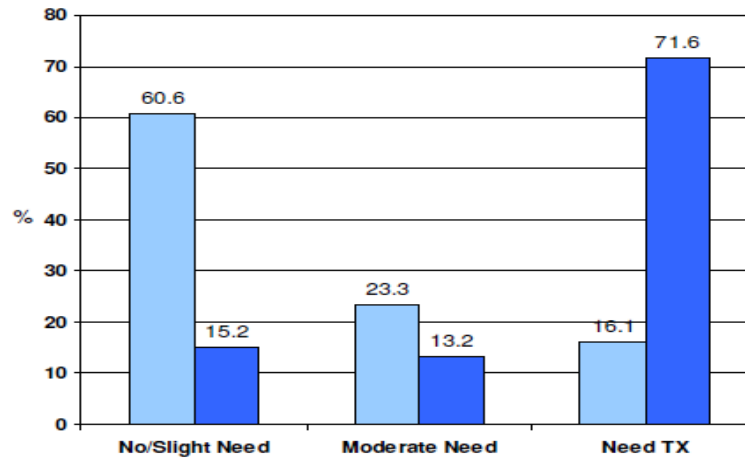
Methods:-

A consecutive sample of 400 subjects (aged 06–56 years) seeking orthodontic treatment was used in this hypothesis. The sample was collected from two different types of practices; government dental clinics (N = 200) and Makkah government dental hospital in the city of Makkah (N = 200) during the period of 2016-2019. All subjects were of Arabic descendants and with no history of orthodontic treatment. The treatment at government dental practices is free of charge while the treatment at Makkah government dental hospital is also free for the general Saudi population. All subjects who were enrolled in the study signed a consent form. Each subject was examined for orthodontic treatment need using of the IOTN.²

Additionally, the self-perceived need for orthodontic treatment was determined by asking each subject to evaluate his or her own attractiveness by comparing it to the standard photographs of the AC of the IOTN. The examiners were trained to use the IOTN following the instructions provided with the IOTN materials.⁵

The IOTN score and the incidence of each variable were calculated statistically. The sample used in the present study was distribution free and therefore non-parametric tests were used. The AC and IOTN categories were

compared between the two groups using the Chi-Square. The IOTN and the AC were also compared using the Chi-Square and were correlated using Spearman's Correlation coefficient.^{6,7,9}



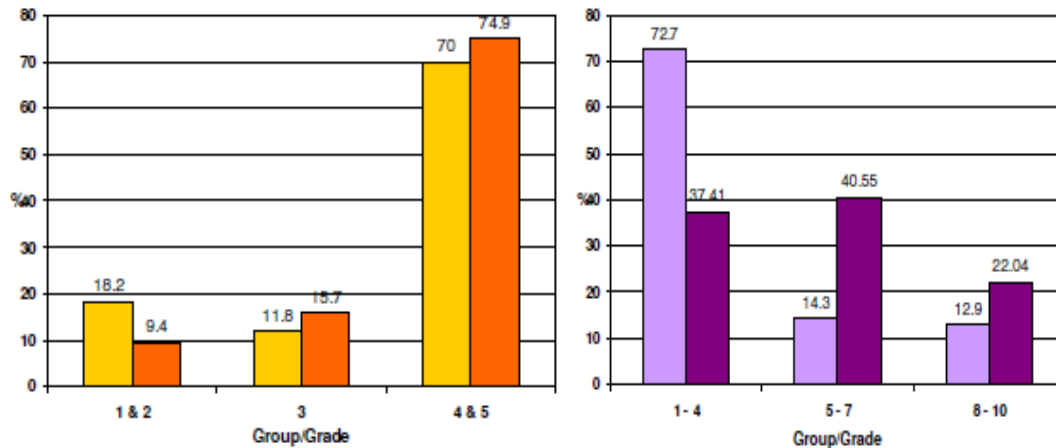
Results:-

The highest incidence of orthodontic problems in the current study was for displacement (89.1%), followed by crossbite (44.5%), deep overbite (33.6%), increased overjet (33.6) and openbite (20%). Impaction incidence was relatively low (8.2%). The incidence of cleft lip and palate was 3.9% . Results of the AC revealed that among the 400 patients studied, 60.6% expressed no or slight need for treatment, while 23.3% expressed moderate to borderline need and 16.1% expressed great need for orthodontic treatment. Comparing these estimates to professional judgments using the Chi Square, the IOTN was significantly (<0.001) different from the AC in the three groups; 15.2% had little to no treatment need (grades I & II), 13.2% had borderline treatment need (grade III) and 71.6% had a great need for orthodontic treatment (grade IV & V).

Spearman's correlation between the AC and IOTN proved no correlation (r = -0.045) between the two components. Comparing the grades of DHC between the government dental practices group and the Makkah government dental hospital revealed that the proportion of the sample estimated to have little to no treatment need (Grade I & II) was significantly higher in the government hospital group (18.2%) than that of Makkah government dental hospital (9.4%) (p< 0.001). The border line proportion (Grade III) was insignificantly different between the two groups.

The proportion of the sample estimated to have a great treatment need was significantly higher in the Makkah government dental hospital than the government hospital group (p < 0.001). Comparing the grades of the AC between the government hospitals group and the Makkah government dental hospital revealed significant differences between the two groups; no or slight treatment need was higher in the group (72.7%) than Makkah government dental hospital (37.4%) and border line and great treatment needs were higher in the Makkah government dental hospital (40.55% & 22.04% respectively) than in the government hospitals group (14.3% & 12.9% respectively).

Orthodontic problem	No. of cases	400	Incidence %	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Class II and III	192		64					
Displacement	288		96	10	28	33	25	
Crossbite (anterior or posterior)	108		36		5.7	20	10.3	
Open bite	93		31		19	7	5	
Overbite	108		36		19.3	11.7	5	
Overjet	194		64.7		33.7	16	10.3	4.7
Reverse overjet (all four incisors in crossbite)	30		10				10	
Partially erupted	68		22.7				22.7	
Supernumerary	4		1.3				1.3	
Hypodontia	37		12.3				11.2	1.1
Impaction	25		8.3					8.3
Retained deciduous	41		13.7					13.7
CL/P	10		3.3					3.3
Other craniofacial anomalies	2		0.6					0.6



Discussion:-

The results of the IOTN shed some light on the pattern of malocclusion that is seen in the city of Makkah, Saudi Arabia, which is dominant mainly of displacement, crossbite, deep bite and increased overjet. However, larger scale studies are required to evaluate the actual pattern of malocclusion in the Makkah region of Saudi Arabia via conducting survey studies on a random sample. The age group targeted in the present study was different than most of the previous studies, which were conducted on children and adolescents who are less reliable in their perception than adults, especially when using the IOTN which moderately reflects the subjective perception of dental aesthetics and demand for orthodontic treatment.^{2,3}

The significant differences between the AC and IOTN and the negative weak correlation between the perceptive and actual need for orthodontic treatment indicates a general lack of awareness among the Saudis about the severity of their existing malocclusion. This can be attributed to their weak oral health knowledge as well as parents' neglect towards malocclusion. This is in agreement with several other studies. Moreover, the perception of occlusal traits in the buccal segments is generally underestimated by people when compared to those present in the anterior segment.^{1,4,5}

The results can also be attributed to the nature of the IOTN itself. The scores of the Makkah government dental hospital may have been exaggerated by the rank of displacement, which would give a high score in otherwise normal occlusion.¹⁶ In addition, the standard photographs of the AC do not show common orthodontic problems such as open bite, which represents a relatively high incidence in the studied sample (20%).^{18,20}

This may have misled those subjects with open bite in their perception of their malocclusion.⁵ Also, there is no evidence of how the severity of those traits is perceived by people. These shortcomings of the IOTN indicate the need to study the appropriateness of the IOTN or ICON as an index for the Saudi Arabians or even to develop a new index that suits such population.⁷ The results have also shown less awareness and appreciation of the severity of malocclusion among patients seeking treatment in a governmental dental clinic, when compared to those paying for their treatment at private dental polyclinics.^{14,19} This could explain the lack of compliance seen among those patients.⁹ Little awareness for the actual need for treatment in the government dental practices group could be attributed to the free treatment provided, which attracts anyone to seek treatment regardless of the severity of his or her malocclusion.² Therefore, it is recommended to use of the IOTN as a screening tool to reevaluate the waiting lists of patients seeking orthodontic treatment at governmental clinics.¹³ This would identify those patients who could benefit the most from such free services and subsequently reduce the long waiting lists at such centers. In addition, the application of minimum charge for treatment at governmental dental clinics can serve the same purpose.^{1,13,15,16}

Conclusion:-

In conclusion, one-quarter of the orthodontic cases in the city of Makkah fall in the severe/extreme orthodontic treatment need. Workforce estimation of orthodontists to cover the severe/extreme need cases. Adult Saudi patients

receiving free treatment at government dental clinics at Makkah had more severe malocclusion. The grades of AC and IOTN were significantly different between those patients seeking free treatment at governmental dental centers .

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