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Research Article

Compliance of Patients with Class III Malocclusion to Orthodontic Treatment

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Abstract: Background**:** Although the new treatment methods developed in recent years are aiming to minimize the need for cooperation of the patients; however, the latter still important factor the treatment. The aim of the study was to evaluate the cooperation level of Class III malocclusion patients with orthodontic treatment. Materials and methods**:** This study followed a cross-sectional style; the targeted population was patients with Class III malocclusion who were treated with three different types of orthopaedic appliances. Four questionnaires were delivered to the patient, patient's parents, and orthodontists. Statistical analyses of the study were performed with SPSS 20.0 software. Descriptive analyses were presented using frequency, percentage, mean, and standard deviation. Results: The study included a total of 183 orthodontic patients in the final analysis. Slightly more than half of the participants were females (52.46%; n=96) and the rest were male (47.54%; n=87). The highest frequency according to the device type was FM (50.8%) followed by CC (31.1%) while FM+RME wearer was 18.1%. Male expressed significantly higher ($p < 0.05$) cooperation and tendency levels towards treatment than females. Cooperation level was also significantly associated with the parents' monitoring and motivation. Conclusion**:** Males had higher levels of treatment desire and cooperation than females during the treatment of Class III malocclusion. In addition, results emphasized the role of the motivational effect of the parent on the positive cooperation of the patients.

Keywords: Questionnaire, Patients Compliance, Class III Malocclusion

Introduction

Class III malocclusion is one of the most difficult malocclusions in terms of diagnosis and treatment especially in mixed and late deciduous dentation [1]. It was first described by Angel according to the position of the molars during occlusion [2]. Later, Tweed further classified Class III malocclusion into two subcategories; pseudo Class III malocclusion and skeletal Class III malocclusion [2].

The early intervention during the growth period of a child with class III skeletal malocclusion using orthopaedic appliances (extra oral or intra oral) is a very common treatment approach with highly successful results. However, these devices are not aesthetically acceptable and require full cooperation from the young patients [3-6]. According to Proffit, Class III malocclusion treatment should be started as soon as possible with the ideal age of 8 years [7, 8]. In most cases, the best time to start the treatment of Class III malocclusion is when the diagnosis is confirmed by the orthodontist [9].

The importance of patient cooperation for the success of orthodontic treatment has been emphasized by many researchers [10-12]. From orthodontic point of view, the cooperative patient is described as an individual with good oral hygiene, wears the devices as they are told, follows an appropriate diet, and fallows the instruction given by the orthodontist [13]. In addition, the cooperative patient could be described

as the patient who comply to the given appointments on time, maintains optimum oral hygiene, uses the device as instructed, and takes care of the appliances whether fixed or removable [10, 11]. Usually, the patient cooperation may be affected by some factors such as sex, age, social class, personality and severity of malocclusion. A problem that may occur in cooperation may lead to deviation from the ideal treatment plan, prolongation of the treatment period and even early termination of the treatment without reaching desirable outcomes.

The degree of the expected cooperation from the orthodontic patient depends on many factors such as age, sex, socioeconomic status, demographic factors [14, 15], patient-family relations [16-18], patient and family's desire for orthodontic treatment, patient's personality characteristics [14, 15, 18-20], and perception of malocclusion [21]. Allan and Hodgson stated that age is important in predicting patient's cooperation. Since pre-adolescent children are more prone to accept and implement the demands of their families, it is possible to provide cooperation with the influence of the family [14].

Some studies have suggested that patient sex my help to predict the patient cooperation during the treatment as females appears to be more adaptable to the treatment than males. Nevertheless, the satisfaction level with the appearance is lower in females than males, thus this feature could negatively affect the use of special appliances needed during the treatment [22]. Additionally, the socio-economic status may have an effect on patient's cooperation. It has been suggested that patients with high socio-economic level cooperate better than patients with low socio-economic level [23].

The aim of the study was to evaluate the compliance of patients with Class III malocclusion to orthodontic treatment using different types of orthopaedic appliances.

Materials and Methods

Study design

This study followed a cross-sectional design and was conducted after obtaining the ethical approval from Faculty of Medicine Clinical Research Ethics Committee, Süleyman Demirel University. It was carried out in the Department of Orthodontics, Faculty of Dentistry, Süleyman Demirel University from September 2019 to July 2020

The targeted population was patients with Class III malocclusion who were treated with three different types of orthopaedic appliances. After obtaining a signed consent from each patient's guardian, a questionnaire was delivered to the patient, patient's parents and the treating orthodontist.

Study population

The following information was recorded for each patient including date of birth, sex, educational backgrounds and occupations of their parents. Eligibility for enrolment of the patients was decided according to the following inclusion/exclusion criteria:

Inclusion criteria:

1. The absence of any craniofacial anomalies congenital or acquired deformity, any muscle disease or systemic disorders.
2. No previous orthodontic treatment.
3. Patients between the ages of 9-17 years.
4. The presence of Class III dental or skeletal malocclusion.
5. Late mixed deciduous or permanent dentition,
6. The treatment is carried either by chin cup (CC), face mask (FM) or face mask with rapid maxillary expansion (FM+RME).

Exclusion criteria:

1. The presence of either Class I or Class II anomaly,
2. Complete completion of the skeletal growth-development period (17 years and over),
3. The presence of congenital missing teeth
4. Having any systemic or psychological disorder,
5. Patients receiving dental or skeletal Class III treatment but not using FM, CC or FM+RME,
6. Treatment time is less than 4 months.

Elements of the questionnaire

The questioners used in the study were the Orthodontic Attitude Survey-OAS (Questionnaire 1), the Orthodontic Locus of Control Scale (OLOCS) (Questionnaire 2) Parent Questionnaire (Questionnaire 3) and Orthodontic Patient Cooperation Scale-OPCS (Questionnaire4). These questionnaires were adopted and translated to Turkish. Their reliability and validity were determined by previous studies [11, 24].

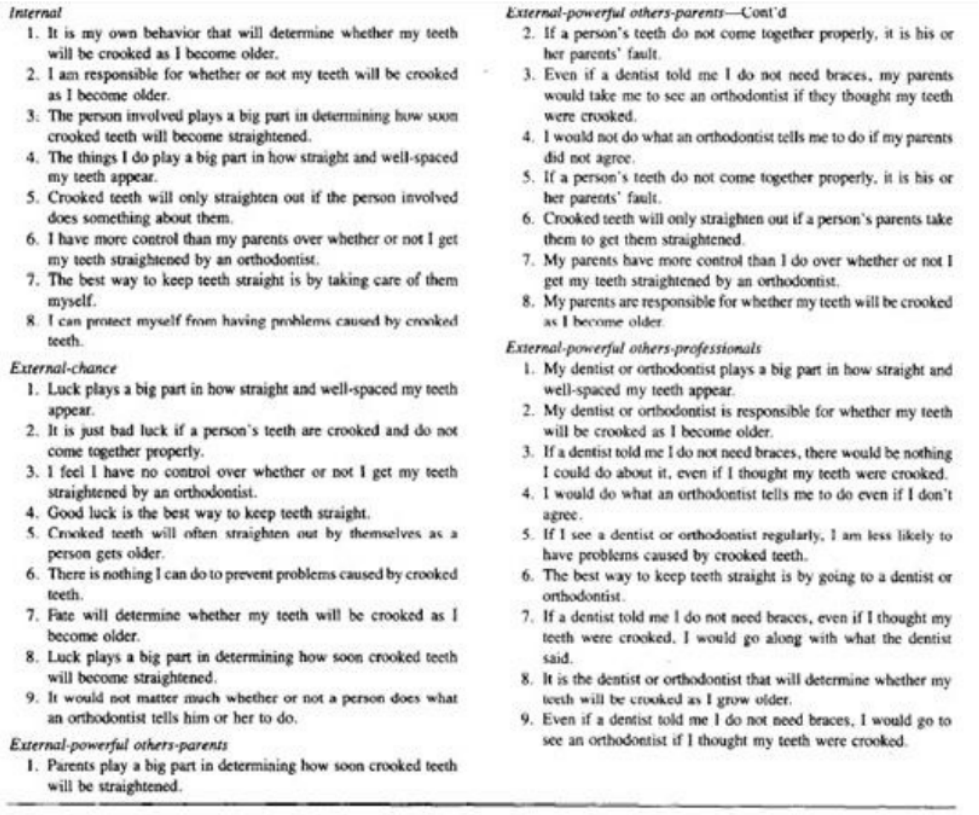
In this study, questionnaire forms were filled during the treatment. Before filling out the questionnaires, all individuals were informed verbally by the main investigator that they should carefully read all the questions, answer them honestly, not get help from anyone while answering the questions and they should answer thoughtfully expressing their opinions [25].

The first questionnaire (Orthodontic Attitude Survey-OAS) was composed of 21 questions dedicated to evaluate the attitude and behaviour towards orthodontic treatment. A score of 1-5 was given to each question.

The section regarding the appliance use consisted of five questions with a score between 5 and 25. The section regarding the patient's opinion towards his/her own occlusion was consisted of two questions with score 5 to 10. The importance of the occlusion in the orthodontic treatment is presented in 16th question. The patient's prospective of the treatment consisted of four questions with average score value of 5 to 20. The 18th question asked about the features the patient did not like in their dentation. The 20th question asked about the person who had the effect on the starting of treatment.

The second questionnaire consisted of 31-item adapted from Orthodontic Locus of Control Scale (OLOCS)[26] and translated from English to Turkish (Figure 1) aimed to evaluate the attitude of the patients towered their own occlusion and their awareness about the responsibilities required by them during the treatment. In addition, the degree to which the patients are affected by internal or external factors (personal and environmental factors) was assessed. All questions were scored according to 5-points Likert scale. External locus of control consisted of four questions (#10, #14, and #17). Theoretically expected point value was in the range of 5-20. Internal locus of control consisted of a total of ten questions numbered (#1 to #7, #9, #16, #22) with an expected score in the range of 5-45. The external family locus of control consisted of seven questions (#18 to #22, #24). The theoretically expected score range here is 5-30.

The third questionnaire, filled out by the parents, included questions relating to the behaviour of the child. The scoring system was made with 5-points Likert scale. The first question was about the treatment expenses and how it had been paid. The second question was related to the idea about the treatment need, the third question was about the child desire for treatment, the fourth question was about the child idea about his/her teeth, and the fifth question was about the parents' opinion about the need for treatment, while the sixth question asked about the patient attitude towards the treatment.



Internal

1. It is my own behavior that will determine whether my teeth will be crooked as I become older.
2. I am responsible for whether or not my teeth will be crooked as I become older.
3. The person involved plays a big part in determining how soon crooked teeth will become straightened.
4. The things I do play a big part in how straight and well-spaced my teeth appear.
5. Crooked teeth will only straighten out if the person involved does something about them.
6. I have more control than my parents over whether or not I get my teeth straightened by an orthodontist.
7. The best way to keep teeth straight is by taking care of them myself.
8. I can protect myself from having problems caused by crooked teeth.

External-chance

1. Luck plays a big part in how straight and well-spaced my teeth appear.
2. It is just bad luck if a person's teeth are crooked and do not come together properly.
3. I feel I have no control over whether or not I get my teeth straightened by an orthodontist.
4. Good luck is the best way to keep teeth straight.
5. Crooked teeth will often straighten out by themselves as a person gets older.
6. There is nothing I can do to prevent problems caused by crooked teeth.
7. Fate will determine whether my teeth will be crooked as I become older.
8. Luck plays a big part in determining how soon crooked teeth will become straightened.
9. It would not matter much whether or not a person does what an orthodontist tells him or her to do.

External-powerful others-parents

1. Parents play a big part in determining how soon crooked teeth will be straightened.

External-powerful others-parents—Cont'd

2. If a person's teeth do not come together properly, it is his or her parents' fault.
3. Even if a dentist told me I do not need braces, my parents would take me to see an orthodontist if they thought my teeth were crooked.
4. I would not do what an orthodontist tells me to do if my parents did not agree.
5. If a person's teeth do not come together properly, it is his or her parents' fault.
6. Crooked teeth will only straighten out if a person's parents take them to get them straightened.
7. My parents have more control than I do over whether or not I get my teeth straightened by an orthodontist.
8. My parents are responsible for whether my teeth will be crooked as I become older.

External-powerful others-professionals

1. My dentist or orthodontist plays a big part in how straight and well-spaced my teeth appear.
2. My dentist or orthodontist is responsible for whether my teeth will be crooked as I become older.
3. If a dentist told me I do not need braces, there would be nothing I could do about it, even if I thought my teeth were crooked.
4. I would do what an orthodontist tells me to do even if I don't agree.
5. If I see a dentist or orthodontist regularly, I am less likely to have problems caused by crooked teeth.
6. The best way to keep teeth straight is by going to a dentist or orthodontist.
7. If a dentist told me I do not need braces, even if I thought my teeth were crooked, I would go along with what the dentist said.
8. It is the dentist or orthodontist that will determine whether my teeth will be crooked as I grow older.
9. Even if a dentist told me I do not need braces, I would go to see an orthodontist if I thought my teeth were crooked.

*Response options are *strongly agree, agree pretty much, agree a little, disagree a little, disagree pretty much,* and *strongly disagree.*

Figure 1: Orthodontic Locus of Control Scale (OLOCS)[26] questionnaire

The fourth questionnaire was filed by the orthodontist who agreed to participate in the study. Slakter et al. designed this scale in relation to appointment tracking and appliance storage. It examined the effect of oral hygiene on the treatment approach to measure the individual's cooperation. Five questions of OPCS containing negative statements are scored in reverse and five questions were evaluated as positive a score of 1 to 5 point are given to each question.

Sample size calculation

G Power 9.1.2 (Universitaet Kiel, Germany) software was used for estimating sample size of the study. Power analysis was performed using the scale score and cooperation information obtained from the pilot studies. Using the behavioural scale information, the effect size was calculated as 0.63. The effect size was calculated as 0.41 using the control scale score. The minimum effect size was chosen for the larger sample. For CC, face mask and FM with RME device types, the F test and one-way analysis of variance

were selected, the margin of error was 5% and the power value was 0.95, and the sample size was calculated as 32 for each group. During the study period, this value was exceeded and a higher number of study groups were determined.

Statistical analysis

Statistical analyses of the study were performed with SPSS 20.0 (IBM Inc., Chicago, IL, USA) program. Descriptive measures were presented using tables as frequency, percentage, mean, and standard deviation. The conformity of the questionnaire scores to the normal distribution was analysed by the Kolmogorov-Smirnov method. Student T-test was used for comparisons between two independent groups. Chi-square analysis with Monte Carlo correction was used to determine the relationships between categorical variables, and Pearson's correlation analysis was used to determine the relationships between numerical variables. The type-I error value was taken as 5% in the entire study, and the $p < 0.05$ value was considered statistically significant.

Results

This study included a total of 183 orthodontic patients in the final analysis. Females represented 52.46% (n=96) and the rest were males (47.54%; n=87). The most common device type was FM (50.8%; n=93) followed by CC (31.1%) while FM+RME was the lowest (18.1%). There was no significant difference of device type distribution according to sex (Table.1).

Table 1: Device distribution according to sex

Device Type	Sex		*p value**
	Male	**Female**	
Chin cup	33 (37.90%)	24 (25.00%)	*0.116*
Face mask	42 (48.30%)	51 (53.10%)	
Face mask+ rapid maxillary expansion	12 (13.80%)	21 (21.90%)	

* Significance at p <0.05 by Chi square test

A significant difference was observed between male and female in the score regarding the treatment desire and preferences in all three groups. Briefly, male preferred having straight teeth over summer vacation whatever the device type used. While 37.5% of females in the CC group (p<0.001), FM group 23.5% (p=0.001), FM+RME group 28.6% (p=0.041) did not prefer the orthodontic treatment (Table2).

Table.2: Orthodontic treatment preference according to device types

Device Type		Sex		*p value**
		Male	**Female**	
Chin cup	Summer vacation	0 (0.00%)	9 (37.50%)	***<0.001****
	Straight Teeth	33 (100.00%)	15 (62.50%)	
Face mask	Summer vacation	0 (0.00%)	12 (23.50%)	***0.001****
	Straight Teeth	42 (100.00%)	39 (76.50%)	
Face mask+ rapid maxillary expansion	Summer vacation	0 (0.00%)	6 (28.60%)	***0.041****
	Straight Teeth	12 (100.00%)	15 (71.40%)	

* Significance at p <0.05 by Chi square test

The importance given by the patient to their own occlusion for those using CC and RME devices did not differ significantly between sexes (Table 3). While in patient using FM, 50% of the males considered their occlusion very important and 82% of the females stated that their occlusion is absolutely important. In patients using a CC device, the importance giving to the orthodontist instructions regarding the treatment was found to be higher in males, while the "somewhat important" option was selected by 12.5% of females (p=0.002). In patients using FM and FM+RME, there was not significantly different between both sexes (Table.4).

Table.3: Importance of occlusion according to sex and device types

Device Type		Sex		
		Male	Female	*p value**
Chin cup	Absolutely Important	21 (63.60%)	21 (87.50%)	
	Very important	12 (36.40%)	0 (0.00%)	***0.459***
	Important	0 (0.00%)	3 (12.50%)	
Face mask	Absolutely Important	21 (50.00%)	42 (82.40%)	
	Very important	21 (50.00%)	6 (11.80%)	***0.020****
	Important	0 (0.00%)	3 (5.90%)	
Face mask+ rapid maxillary expansion	Absolutely Important	9 (75.00%)	12 (57.10%)	
	Very important	3 (25.00%)	3 (14.30%)	***0.092***
	Important	0 (0.00%)	3 (14.30%)	
	Somewhat Important	0 (0.00%)	3 (14.30%)	

* Significance at p <0.05 by Chi square test

Table 4: Consideration of orthodontist instruction according to device types

Device Type		Sex		
		Male	Female	*p value**
Chin cup	Very important	30 (90.90%)	12 (50.00%)	
	Important	3 (9.10%)	9 (37.50%)	***0.002****
	Somewhat Important	0 (0.00%)	3 (12.50%)	
Face mask	Very important	33 (100.00%)	24 (100.00%)	
	Important	33 (78.60%)	30 (58.80%)	*0.124*
	Somewhat Important	6 (14.30%)	15 (29.40%)	
Face mask+ rapid maxillary expansion	Very important	12 (100.00%)	18 (85.70%)	*0.170*
	Important	0 (0.00%)	3 (14.30%)	

* Significance at p <0.05 by Chi square test

The need for orthodontic treatment realization rate in females who used CC device was found to be significantly higher (p=0.018) than male; however, there was no significant difference in patients using FM. The frequency of females, using FM+RME device, who realized the need for treatment was found to be significantly high (p<0.001) as compared to male (Table.5). On the other hand, there was no significant

difference according to the sex regarding the person who had the impact on the decision to start the orthodontic treatment (Table.6).

Table 5: Orthodontic treatment needs according to device types

Device Type		Sex		*p value**
		Male	Female	
Chin cup	By the warning of my friends	3 (9.10%)	0 (0.00%)	***0.018****
	By the warning of the dentist	27 (81.80%)	18 (75.00%)	
	By the warning of my family	3 (9.10%)	3 (12.50%)	
	I notice it myself	0 (0.00%)	3 (12.50%)	
Face mask	By the warning of the dentist	33 (78.60%)	39 (76.50%)	*0.451*
	By the warning of my family	9 (21.40%)	9 (17.60%)	
	I notice it myself	0 (0.00%)	3 (5.90%)	
Face mask+ rapid maxillary expansion	By the warning of the dentist	6 (50.00%)	3 (14.30%)	***<0.001****
	By the warning of my family	6 (50.00%)	3 (14.30%)	
	I notice it myself	0 (0.00%)	15 (71.40%)	

* Significance at p <0.05 by Chi square test

Table 6: People who influence the treatment decision by device type

Device Type		Sex		*p value**
		Male	Female	
Chin cup	Dentist advice	12 (36.40%)	9 (37.50%)	*0.931*
	Family advice	21 (63.60%)	15 (62.50%)	
Face mask	Dentist advice	15 (35.70%)	24 (47.10%)	*0.635*
	Family advice	27 (64.30%)	24 (47.10%)	
	My self	0 (0.00%)	3 (5.90%)	
Face mask+ rapid maxillary expansion	Friends' advice	3 (25.00%)	0 (0.00%)	*0.195*
	Dentist's advice	0 (0.00%)	6 (28.60%)	
	Family advice	9 (75.00%)	12 (57.10%)	
	My self	0 (0.00%)	3 (14.30%)	

* Significance at p <0.05 by Chi square test

The scale scores were compared according to sex (Table.7). The scale scores obtained from the questionnaire forms filled by patients, parents and orthodontist did not differ significantly between both sexes.

In the correlation analysis performed between the scale scores, a low level of significant and positive correlation was found between the behaviour score and the other scales (Table.8). The patients' behavioural cooperation scale and orthodontic treatment control score were low and positive (r=0.163; p=0.027). A significant and positive correlation were observed in association with parents' cooperation (r=0.154; of

p=0.037) and with the patient-orthodontist cooperation (r=0.577; p<0.001). There was no significant relationship between the control scale and the parent and orthodontist cooperation scales. A low level of positive correlation (r=0.176; p=0.017) was found between parent and orthodontist cooperation scales.

Table 7: Scale general scores by sex in detail on device types

Device Type	Sex	Behaviour Score§	Control Score§	Parent Score§	Orthodontist Score§
Chin cup	Male	64.09±7.83	95.09±11.75	16.90±2.54	21.96±4.39
	Female	66.00±6.17	96.75±5.49	16.37±3.18	22.04±4.41
	p value*	***0.326***	***0.524***	*0.485*	*0.952*
Face mask	Male	62.33±8.55	96.28±9.67	17.35±2.80	22.21±4.28
	Female	62.86±10.69	97.88±12.54	16.25±2.69	22.01±4.19
	p value*	*0.796*	*0.501*	*0.057*	*0.826*
Face mask+ rapid maxillary expansion	Male	62.75±2.00	101.00±4.45	16.91±2.35	20.50±0.90
	Female	64.14±6.27	94.66±10.59	15.80±3.01	20.00±2.81
	p value*	*0.463*	*0.059*	*0.282*	*0.565*

§Mean ± SD

* Significance at p <0.05 by Student's t-test

Table 8: Correlation values between scale scores

		Control Score	Parent Score	Orthodontist Score
Behaviour Score	*r*	0.163	0.154	0.577
	p	***0.027****	***0.037****	***<0.001****
Control Score	*r*		-0.013	-0.036
	p		*0.865*	*0.633*
Parent Score	*r*			0.176
	p			***0.017****

r: correlation coefficient

* Significance at p <0.05 by Pearson's correlation

Discussion

Class III malocclusion considered one of the challenging conditions in terms of diagnosis and treatment. Treatment could be started during the period of growth using either extra oral or intraoral appliances in order to stimulate or modify the growth of the maxilla or inhibit the growth of the mandible. These appliances utilize the orthodontic force to correct the sagittal disharmony between the maxilla and the mandible. Due to the fact these types of appliances controlled mainly by the patient and should wear the appliance for at least 14-18 hours per day, therefore, cooperation of the patient is required to achieve desirable outcomes. Nevertheless, compliance of the patient is not easily obtained due to the fact that the design of these appliances is bulky and not aesthetically acceptable which is not tolerated well by the child.

In addition, the young patients are potentially subjected to bullying by their peers which increase the difficulty to convince the child to wear the appliance.

Indeed, psychological analyses are useful tools for measuring patient's cooperation during treatment and guide the orthodontists about patient-specific treatment approach. In our study, the aim was to measure and correlate the cooperation for three types of appliances used for treatment of Class III malocclusion. This was achieved by using four, previously validated, questionnaires including OAS, OLOCS, CCE, OPCS [27]. Patients selected for this study had started the treatment for at least 4 months depending on the results obtained by Slakter et.al which stated that in order to measure the cooperation of the patient a period of 4 to 8 months should passed in order to establish a solid communication between the patient and the orthodontist [28].

While some studies stated that the socio-economic level is a crucial factor for patients' cooperation, other studies claimed the opposite [23, 29]. Sergal et al., suggested that the socio-economic status of the family is not a detrimental factor to obtain cooperation of the patient [30]. Results of current study could not confirm nor contradict this notion since treatment expenses were covered by the health assurance provided by the government i.e., standardized the socio-economic factor for all the patients included in the study.

Age of the patient is another factor that could affect the level of cooperation. Previous studies showed heterogeneity when selecting the age limit. For instance, some reported an age range of 12-15 years [31] or 11-14 years [32-35] or the age limit was set at 16 years [36, 37], while in other studies age standardizing was preferred [24, 28, 38, 39]. A questionnaire-based study conducted by Verda et al. at Istanbul University, the age limit was determined between 11 and 16 [40]. In this study, the age range was determined between 9 and 17 years due to the fact that Class III malocclusion treatment mainly starts at the age of 9 years old. These variations in age groups could explain the differences in results obtained by the aforementioned studies.

According to available literature, orthodontic treatment is more accepted by the females who also more cooperative compare to the males of the same treatment groups. This could be explained that the female are more concerned about their appearance and the aesthetic of their dentation than male [41, 42]. This notion has been supported by results of Karaman et al who showed that the females used the orthodontic appliances as instructed by the orthodontist and tend to be more cooperative than male during the treatment [43]. This was inconsistent with results of the current study which indicated that males preferred the orthodontic treatment and had a desire the treatment more than the females in all the three types of devices included in the study. While only 62.5% of CC, 76.5% FM and 71.6% FM+MRE the girls preferred the orthodontic treatment.

According to a previous study, 80.9% of the patient were motivated by their families; also the majority of the patient, even in the presence of pain or discomfort during the appliance application, continued to wear the appliances which indicate that a well-motivated patient tends to show a higher degree of cooperation [43]. In this study the collective answers of both the patients and the parents showed that the majority of the patients were well motivated by their families. In addition, 56.8% of the parents insisted

on the treatment even if the patient did not want the treatment at the beginning. Further, 85.2% of the patient continued wearing their appliance in order to obtain good-looking dentation which suggested a high motivational level provided by their families.

Conclusion

It can be concluded that males had higher levels of treatment desire and cooperation than females during the treatment of Class III malocclusion i.e., sex could be a predictive independent variable for expecting patient's cooperation during orthodontic treatment. In addition, results emphasized the role of the motivational effect of the parent on the positive cooperation of the patients.

Conflict of interest: None.

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العنوان: امتثال المرضى الذين يعانون من سوء الإطباق من الدرجة الثالثة لعلاج تقويم الأسنان

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المستخلص:

الخلفية: على الرغم من أن طرق العلاج الجديدة التي تم تطويرها في السنوات الأخيرة تهدف إلى تقليل الحاجة إلى تعاون المرضى ؛ ومع ذلك ، فإن هذا العامل لا يزال مهماً في العلاج. ان الهدف من هذه الدراسة كان لتقييم تعاون المرضى في علاج تقويم الأسنان في الإطباق من الدرجة الثالثة..

المواد وطرق العمل: اتبعت هذه الدراسة أسلوب المقطع العرضي. كان السكان المستهدفون هم المرضى الذين يعانون من سوء الإطباق من الدرجة الثالثة والذين تم علاجهم بثلاثة أنواع مختلفة من أجهزة تقويم العظام. بعد الحصول على موافقة موقعة من الوصي على كل مريض ، تم تسليم استبيان إلى المريض ووالدي المريض وأخصائي تقويم الأسنان.

النتائج: تم إجراء التحليلات الإحصائية للدراسة باستخدام برنامج **SPSS 20.0** (شركة آي بي إم ، شيكاغو ، إلينوي ، الولايات المتحدة الأمريكية). تم عرض المقاييس الوصفية باستخدام الجداول حسب التكرار (النسبة المئوية) والمعدل الحسابي والانحراف المعياري. شملت الدراسة 183 مريضًا لتقويم الأسنان. كان أكثر من نصف المشاركين بقليل من الفتيات (52.46٪ ؛ العدد = 96) والباقي من الذكور (47.54٪ ؛ العدد = 87). أعلى معدل في مجموعات نوع الجهاز كان **FM (50.8%)**؛ يليه **CC (31.1%)** بينما كان **FM + RME** أكثر بقليل من 18.1٪.

الاستنتاج: تظهر النتيجة التي تم الحصول عليها من الدراسة أن الذكور الذين شاركوا في الدراسة لديهم إمكانية أكبر لإظهار التعاون أثناء العلاج التقويمي عند مقارنتهم بالإناث ، من وجهة نظر سريرية ، يمكن أن تكون هذه الدراسات مفيدة من حيث التنبؤ بالعوامل المحددة لتعاون المريض.

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