DENTAL MEDICINE

Parental influence in orthodontic treatment: a systematic review

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Abstract

The reasons for searching orthodontic treatment in pediatric/adolescent patients are multifactorial. The aim of this systematic review was to study the parental influence in this process.

This study comprises a systematic review of the literature, based on the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyzes. We analyzed 41 articles related to the study hypothesis, 29 of which followed the general inclusion criteria, and 21 specific studied the parental influence in orthodontic treatment.

The results demonstrated that dental aesthetics and facial appearance were the main triggering factors related to the search for orthodontic treatment. Pair influence also plays an important role. The perception of malocclusion and the motivation are factors that emphasize the importance of parents in this process. Parental support was identified as a positive factor in orthodontic success reported in most of the studies.

Parental influence has a positive effect on orthodontic treatment and should be understood by clinicians as a central factor in achieving the desired treatment plans.

Keywords: orthodontic treatment, aesthetics, facial appearance, parents and motivation

Introduction

The need for orthodontic treatment (OT) depends on several factors, which include skeletal and functional developmental differences that can lead to malocclusion and significant negative consequences over time. Additionally, psychosocial status related to facial aesthetics, self-esteem and perceived attractiveness are also important aspects that should be considered by the orthodontist [1-6].

Multiple factors influence the process of decision-making in OT: self-perception and self-esteem, patient/parent education, economic situation, overall oral health, relationship and trust in the dentist, time of use and comfort of the device, among others. However, dental aesthetics, facial attractiveness, and the influence of peers (parents, friends, teachers and society in general) are the most motivating factors [3,4,7-13]. In this study, we focus on the influence of other people, particularly the patient's parents, on the success of OT [7,8,14].

Parental influence on the development of children's personality and attitudes has been studied for a long time. Children generally tend to see their parents as an example to follow [15,16]. Even in the case of dysfunctional families with negative parental relationship, there is evidence of the influence of parents' actions on the morphing of their children's personality, despite major differences and/or disagreement [17-20].

Within the family context, many factors, including psychological, social and cultural aspects, influence the parents' motivation to seek orthodontic care for their children [8,21-24]. A healthy relationship between parents and young patients is very important, given that children often view their parents as an authority and believe that their decisions are for their own benefit. A good relationship also provides a greater opportunity for dialogue, which

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allows them to share their dislikes and discomforts, thus, anticipating the willingness for treatment. Notably, cultural beliefs vary, such as what may be seen as beautiful and "healthy" in one culture may not be seen in the same way in another [2,5,22,25].

The dentist must be aware of these factors that lead patients and parents to seek OT. It is also very important to understand the various ways to keep patients and parents focused and motivated throughout the treatment, while emphasizing on the parental role. In this context, the main objective of this study was to assess the parental influence in OT and, as secondary objectives, to understand the main motivating aspect for seeking OT and how the dentist can include the parents of the process of orthodontic treatment.

Methods

This study comprises a systematic review of the literature, based on the recommendations of the Preferred Reporting Items is Systematic Reviews and Meta-Analyzes (PRISMA - www.prisma-statement.org).

The PubMed, Scopus, Scientific Electronic Library Online (SciELO), Latin American and Caribbean Literature in Health Sciences (LILACS) databases were used as sources for manuscript search. Whenever further clarification was necessary, the authors of the selected articles were contacted by mail.

The MeSH Terms used in PubMed were: index of orthodontic treatment need, orthodontics, parents, motivation and peer influence. These key-words were adapted to the other databases and parental influence was also included. The research took place between March and April of 2020, and the retrieved records were exported to the Endnote X20® software in order to avoid duplication and for bibliographic citation. The ethical considerations included all research being based exclusively on clinical studies already published in digital databases and articles published in electronic journals. Thus, no trials or testing was carried out on patients and no confidential data were measured or used.

The mandatory inclusion criteria adopted comprised studies carried out with the relationship between children and parents, and patients actually undergoing orthodontic treatment. The specific exclusion criteria were: caregivers, stepfathers or other caregivers other than direct family members, disabled children, and illiterate parents undergoing orthodontic treatment.

From an initial survey of 174 articles with the combinations of the used key-words in title or abstract, 41 articles that met the criteria previous mentioned were obtained. In the second stage of the investigation, the review was carried out blindly - the articles were renamed with numbers, and the author, year, and place of publication were omitted to avoid potential bias and conflict(s) of interest.

Both authors of this manuscript read and carefully evaluated all included manuscripts. Of the 41 articles initially obtained and carefully analyzed, 4 were excluded for deviating from the mandatory inclusion criteria. Two analyses were performed, the first was a general evaluation and comprised 37 manuscripts. Since only 29 met all inclusion and specific exclusion criteria and responded directly to the main objective of the study, a second evaluation was made. The rest were only analyzed and served to support the bibliography, as they provided some relevant information. The Kappa test was used to verify the agreement between the authors of this manuscript in the concordance of papers selection. After this screening, the final sample was carefully revaluated and the data were extracted into an Excel® spreadsheet.

Results

For the results of this study the 29 selected articles were carefully analyzed, the relevant information was extracted and the main factors that influence the demand for OT, as well as parental factors influencing OT and motivational factors for OT were extracted. Kappa test between the two authors was 0.90, being considered almost perfect.

From the 29 selected articles, 21 (72.4%) directly studied the demand for OT and the results are shown in table I.

Dental aesthetics/facial attractiveness and peer influence are the most relevant factors in OT demand, frequently cited in the selected literature.

Table I. Factors that influence the demand for OT reported in the literature.

Factors	Reference number
Dentist attitude	4, 5, 8, 26
Patient's self-esteem	1, 4, 21, 24, 27
Peer influence (parents, friends, teachers, society)	1, 3-5, 8, 14, 21, 24, 28-31
Oral health	8, 21, 27
Economic situation	3, 5, 28, 30, 32
Patient/parent education	3-5
Self-perception	5, 14, 28, 33
Dental Aesthetics / Facial Attractiveness	1, 3, 4, 6, 8, 14, 21, 24, 25, 28, 29, 31-35
Time using the orthodontic device	8, 14

The second and more specific analysis included 20 from the 29 selected articles (69.0%) that directly studied the parental influence on OT (Table II). The main findings demonstrated the importance of parents to perceive children malocclusion and facial aesthetics.

A third analysis was performed and table III demonstrates how many times the selected literature reported the main motivational factors of influence in OT.

Table III analysis demonstrates that, from the 20 selected studies (69.0%), 13 reported dental aesthetics as the main motivational factor influencing in the OT (65.0%). Furthermore, 10 of these studies supported this information. Besides dental aesthetics, the factors most frequently reported to have an impact on OT were: malocclusion, parental support, peers influence, self-esteem and socio-economic status.

The selected articles used different methodological strategies to study the analyzed variables, which included: questionnaires [3-8,14,18,25,26,28,29,32,35,36,38], clinical examinations [1,6,28,34,35], interviews [22,34] and scales [24,27]. The analysis of the included manuscripts results also revealed some important aspects, namely:

- four articles [1,7,27,32] focused solely on the answers provided by children (n = 7417 children),
- one study [22] only focused on the answers given by the parents (n = 70 parents),
- fourteen studies [3-6,8,14,24,25,28,29,34-36,38] evaluated the responses of both children and parents (n = 3958 children and 3866 parents), and
- one study [26] evaluated the answers given by the dentists (n = 123 orthodontists).

Therefore, in this specific analysis responses from 11375 children, 3936 parents and 123 orthodontists in total were evaluated.

The additional important findings of the included manuscripts comprised factors referred to as preponderant for adherence to orthodontic treatment including: duration of use of the appliance [8,14], the level of oral health of the patient [8,21,27] and attitude of the dentist [30]. A good relationship between the dentist and the parents was also referred as an important factor [2,21,26]. The fear of being considered a careless parent was one of the main factors that led to seeking OT for their children [8,30,34].

Other aspects, such as facial aesthetics, improved self-esteem, better social life, improved grades at school, success in the search for a partner and greater professional success, and the search for empathy between other people were also identified as important influencers for both parents and children in seeking OT [7,8,21,22].

Additionally, the main results of the manuscripts reported that for younger children, the most important opinions were those of parents and teachers, and that they felt more secure when the influences of parents/teachers were exerted [29]. Moreover, parents were considered the main decision makers when it comes to their children's health [7,9,14]. Related to this aspect, the final decision on advancing or not with the treatment usually belongs to parents. The fact that some of the parents have used braces before [29] and the educational level of the parents [24] also influence this choice.

Table II. Parental factors influencing OT reported in the literature.

Factors	Reference number
Relationship between dentist and parents	2, 21, 26
Parental trust in children	7, 8
Parents making the final decision	7, 9
Parental supervision during treatment	7, 30, 33, 36
Parental perception of malocclusion	4, 5, 7, 8, 12, 21, 24, 29, 33, 37
Parental concern about their children's future appearance	4, 7, 8, 21, 22, 36
Parental motivation	3, 7-10, 33, 36
Facial aesthetics	2, 4-6, 8, 21, 22, 24, 25, 29, 36, 37
Investment of time and money	8, 9
Socioeconomic condition	2, 3, 5, 6, 32
Patient/parent education	24
Parents who have already undergone OT	29

Table III. Factors identified as the main motivators for OT in the literature.

Relationship	Reference number
Parental support as a positive factor in OT	5-8, 25, 29, 34, 36
Peers influence in TO	3, 8, 14, 26, 32, 36
Self-esteem and TO	4, 22, 27, 32
Malocclusion and TO	3, 4, 6, 14, 24, 25, 27, 32, 34, 35, 38
Socio-economic status and TO	5, 24, 28, 32
Dental aesthetics and TO	1, 3-6, 14, 24, 25, 28, 29, 32, 34, 35

Discussion

Orthodontic treatment is a complex modality of dental rehabilitation and has a series of variables that should be carefully evaluated including the age of the patient, the severity of malocclusion, the gingival biotype, the effectiveness of oral hygiene, among others. These aspects condition the OT degree of success and should be discussed between dentist and patients/caregivers [39-41]. Several factors are highlighted as important, not only in the decision-making process regarding adherence to OT by both child patients and parents, but also for motivation during OT. The main results of this study demonstrated that the dental aesthetics and facial attractiveness were undoubtedly the aspects most highlighted in OT by both parents and children [1,4,6,25,28,29,34,35].

Since early ages, individuals are influenced by ideals of beauty that condition their opinions and their choices. The face is the main focus of a person's identification and a source of non-verbal information. The areas most examined for facial recognition and beauty perception are contained within what has been defined as the "inner triangle" encompassing the smile [42,43]. Thus, a more pleasant facial appearance presupposes the existence of a pleasant and harmonious smile. The beneficial consequences of this aspect range from an increase in self-esteem and self-confidence for the individual, to a greater empathy and ability to influence people [24,25]. In contrast, dissatisfaction with one's dental appearance, can manifest itself in a hesitation to speak or smile, thus adversely affecting social relationships [35]. In this context, dentists, mainly orthodontists, should be aware of these variables and carefully consider it in the OT planning as well as bringing it to discussion with patients and/or caregivers.

The desire for peer acceptance has long been understood, and is evident from early age. The results of this study demonstrated that for younger children, the most important opinions were those from parents and instructors, and that they felt more secure when parental/teacher influence is exerted. During pre-adolescence, the desire to stand out among colleagues begins, which later develops in the complexity of adolescence that includes the search of a partner, and so on [11,29]. It is known that with age, the desire for acceptance by society grows. Therefore, the greater the degree of consciousness of the individual, the greater the probability for seeking OT, in order to be seen as more empathic by others [1,8,11,14,31,35,38].

Additionally, it was demonstrated through research that peers also have an influence on parents' opinions and actions. Importantly, the fear of being considered as a careless parent was one of the factors leading to the demand for OT for their children [7,8,22]. For these parents, the concern with the facial aesthetics of their children goes hand in hand with the concern about the future, and these are the most highlighted associated factors. Parents believe that investing in OT will have short- and long-term beneficial consequences for their children, such as improved self-esteem, better social life, improved grades at school, success in the search for a partner and greater professional success [21]. The influence of the parent's opinion and their beliefs of the importance of the OT for their children is an important factor that should be considered by the dentist, since parents are the main decision makers when it comes to their children's health [7,9,14].

It was reported that most individuals, subjected to self-assessment before and after OT, revealed a significant improvement in the degree of satisfaction and in the perception of their smile and teeth [11], which confirms the significant positive influence of OT on self-perception and self-esteem. These data are in line with those described in several studies and emphasize the decisive effect that the smile has on the development of the individual's personality and confidence, with a significant improvement in the quality of life [4,22,27,32]. Moreover, after undergoing OT, around 94% of individuals reported a positive self-impact with a significant improvement of the degree of satisfaction with facial esthetics [11]. In accordance with this information, another study [31] demonstrated that dental and facial attractiveness were significantly perceived as better after OT by both parents and colleagues of the participant patients. These results are in line with those of the present study, thus showing the positive influence of OT on the subjective and relatively objective perceptions of the social dental-facial attractiveness.

The acceptance of OT stems from the fact that self-perception, the desire for a more attractive appearance, gaining self-esteem, acceptance by peers, and the belief in it will provide a better future. This is very important and are the main factors influencing parents in the search of a better quality of life to their children [7,21,24]. Additionally, there are several factors that influence the OT adherence. At the individual level, the concern with the oral health [8,21,27], the attitude of the dentist [4,5,8,26], the economic situation [3,5,28,30,32] and the patient's educational level [3-5] are important factors. Fear of pain [8,38], the need for dietary changes [2], the discomfort caused by the device [8,38] and the lack of support by the National Health System [3] are among the factors referred to as most hindering OT access. Altogether, these are important factors that the orthodontist should be aware of and bring into the treatment plan including discussing them with patients and parents.

When age is taken into consideration, children and young adults occupy the main groups in the demand for OT [10,30]. In this context, parents exercise one of the most important predictive factors, as previously reported [7]. This aspect, also highlighted in other studies, can be justified by the fact that parents or caregivers are the main decision makers when it comes to their children's health [7,9,14]. Furthermore, parents also generally create an atmosphere of encouragement and trust for their children, as they usually represent the people they trust the most

[7,8]. Nevertheless, parents' word is usually considered "true" and children view their parents as role models [8,21], consequently following their recommendations.

It has been demonstrated that the most common reasons for parents to seek treatment for their children are due to irregular teeth positioning, and fear of being accused of neglecting their parental duties [8]. These affirmations are not in accordance with the results of the majority of the literature found in this systematic review, in which the concern with facial aesthetics and dental appearance comes as the main factor and stands out relative to others. These results may be influenced by the population of selected studies. It was also found [8] that, while children are more motivated in the pre-treatment and initial phases, while parents are more motivated as OT progresses. This aspect can be justified by the initial excitement of the child towards a new situation and the sense of responsibility that is conferred on them, while the parents are enthusiastic about the evolution of the treatment and its positive effects [8,22]. These aspects highlight the importance of the role that parents have, and the accompaniment given to children throughout OT. It is important that parents follow up and encourage children, thus reducing the occurrence of discontinuation or even negligence regarding treatment. It is also essential that the dentist realizes that the motivation must be directed especially to the patient but without ever forgetting the parents, since they are essential in support and motivation [4,10,22,36]. In this context, the routine consultations should include a time dedicated to discuss these aspects whenever the orthodontist detects the lack of motivation.

As for parental influence, it was also found that parents who had undergone OT themselves understood better the process importance and played an increased motivational role [8,29,37]. This aspect also leads to greater initial motivation of the child in seeking and accepting OT, because the family environment is the main place of learning and has a preponderant role in the formation of the child's personality and desires [15,16].

Socioeconomic status is also one of the factors that influence parents' decision-making about OT [2,3,5,6,28,32]. The results of the present study showed that parents with higher incomes understandably have an easier acceptance of OT, not having a major impact on financial expenses. Favorably, the fact that OT has a set of positive consequences, as well as, repercussions throughout life, makes this expense a positive investment [21], leading to efforts being made by some families in order to be able to carry out the treatment. This aspect has also consequences for the child's attitudes, because of the fact that they see their parents investing time and money towards their healthcare, leading them to value this process [8,9].

In the same way and as for general health, the educational level of the parents influences the perception and acceptance of the OT. This aspect can be justified by the association of a higher literacy degree with a greater awareness of malocclusions and concerns regarding oral and dental health, with a consequent search for OT and acceptance of it [24]. The orthodontist should be aware of this limitations, whenever present, and adapt the explanations related to the OT to the degree of literacy of each family. Additionally, the opinions of orthodontists on the factors that affect the choice of orthodontic practices by patients and their parents were evaluated, and the results demonstrated that the physician's attitude and personal characteristics were pointed out as the main factors [26]. Other studies [4,5,8,26] also mentioned the importance of professional complacency, although they did not give it the greatest prominence. Therefore, it can be concluded that the dentist should try to have a clear and simple communicative language with the patient and parents, to create a positive environment of empathy and trust, in order to be an additional motivator in the decision making regarding OT.

The limitations of the present study included the type of articles included and their different geographical areas. Therefore, most of the differences observed are due to or had some relationship with the cultural differences existing between the different countries evaluated. The specific ideologies of each country and the surrounding context of both the patient and the parents influence the individual's personality, ideologies and wishes, being another source of bias. In this context, it is to be expected that different countries as well as different study populations will have different results.

Future and more comprehensive research in this area should consider psychological and cultural aspects, patient`s age, relationship between young patients and parents/caregivers, literacy and socioeconomic status. Within the limitations of this review, the main implications for clinical practice are helping all dentists that works with orthodontics in understanding the most important factors in recruiting patients, keeping them motivated throughout the treatment and achieving the best results of orthodontic treatment for each individual. The consequences will impact in the society due to a better quality of life to the patients including better emotional coping related to the facial appearance and also for the clinicians helping them to understand a factor so important and closely related to the success of orthodontic treatment.

Conclusions

In conclusion, the orthodontist must determine the patient's motivation to seek treatment. When this preliminary step is taken, the chances of a mutually satisfactory outcome are increased. Effectively, motivation is the key; not only at the beginning of OT for adherence, but throughout the treatment, as the motivation of the patient and parents must be worked on in order to achieve greater commitment, involvement and compliance with the

recommended standards to reach the most favorable OT results possible. Additionally, the personalized OT should consider other important aspects such as degree of literacy, socioeconomic status and expectations from both patients and parents.

Parental influence is an important key factor for the success of orthodontic treatment. This relevant relationship should be recognized and understood by clinicians as a positive reinforcing factor for the adherence and success of the treatment plan. It is recommended that the dentist working with orthodontics should relate, involve and advise the caregivers during all phases of treatment to achieve the best results.

Finally, dentists should be aware that dental aesthetics and facial attractiveness were the aspects most highlighted by both parents and children in the seeking of orthodontic treatment.

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