

Dietary habits and weight loss in orthodontic patients

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Abstract. Objective: The aim of this research was to determine if activating the orthodontic appliance in orthodontic patients can change their dietary habits, leading eventually to weight loss. Material and Method: This study was conducted on a group of 160 respondents who were divided into 3 age categories: 6-12 years, 12-18 years, over 18 years. The research consisted of applying a questionnaire based on three questions with single choice. The main condition to be included in this study was to undergo an orthodontic treatment. The obtained results were included in tables using Microsoft Excel and the statistical analysis was performed using IBM SPSS Statistics 20. Results: Among the patients from the 6-12 years age category and those from the 12-18 years age category, the proportion of those without any change in their eating habits is significantly higher than the proportion of patients who changed their eating habits. On the other hand, among orthodontic patients over 18 the proportion of patients who changed their eating habits is significantly higher than those who did not change their diet. Among patients aged 6-12 years the proportion of those without any weight loss is significantly higher than those with weight loss, while among patients over 18 years, the proportion of those with weight loss is significantly higher than those without any weight loss. Conclusion: As an orthodontic patient is older, the harder it is for him to adapt and to be tolerant to any change in his oral cavity. Also, compared to younger patients, older patients are prone to lose more weight.

Key Words: Orthodontic patient, weight loss, diet.

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Introduction

More than 70% of the Caucasian orthodontic patients are reported to be experiencing pain during an orthodontic treatment (Firestone et al 1999). Pain is considered to be a complex, subjective response to noxious stimuli which frequently accompanies orthodontic appointments, thus showing large individual variations depending on the stage of therapy, the type of appliance, the amount of force, any previous painful treatments, cognitive and environmental aspects like culture, sex or age (Scott et al 2008; Wiechmann et al 2008). Moreover, pain can be incriminated as a major reason for discontinuing orthodontic treatment (Kluemper et al 2002).

The discomfort that occurs during an orthodontic treatment can severely damage the quality of a person's life (Feu et al 2013). Various studies reported that orthodontic patients experienced difficulty in brushing teeth, chewing and biting food of hard consistency, chewing against resistance, eating crispbread, raw carrots and apples, thus determining them to change their dietary habits (Bergius et al 2000; Feldmann et al 2012; Festila et al 2016).

Consequently, during the first month of treatment, orthodontic patients tend to follow a soft food diet and to decrease their dietary intake, leading to a great weight loss and to a decreased body mass index. However, patients should pay more attention

towards their health and try to consume food rich in nutritional values, without any restraint regarding the type of food (Sandeep et al 2016; Marcenet et al 2003).

The aim of this research was to determine if activating the orthodontic appliance in orthodontic patients can change their dietary habits, leading eventually to weight loss. The premise of this study was the fact that younger patients can bear easier a change in the orthodontic appliance compared to elderly patients.

Material and method

This study was conducted between the 1st July 2018 and the 31st February 2019 on a group of 160 respondents who underwent orthodontic treatment in Crişana region, Romania, in accordance to the World Medical Association (WMA) Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects approved by the Ethics Committee of the University of Oradea, Romania. All patients in this study had their parents' consent. The group of patients was divided into 3 age categories: 6-12 years, 12-18 years, over 18 years.

The research consisted of applying a questionnaire based on 3 questions with single choice. The main condition to be included in this study was to undergo an orthodontic treatment. The questions referred to the age of the respondent, any change in

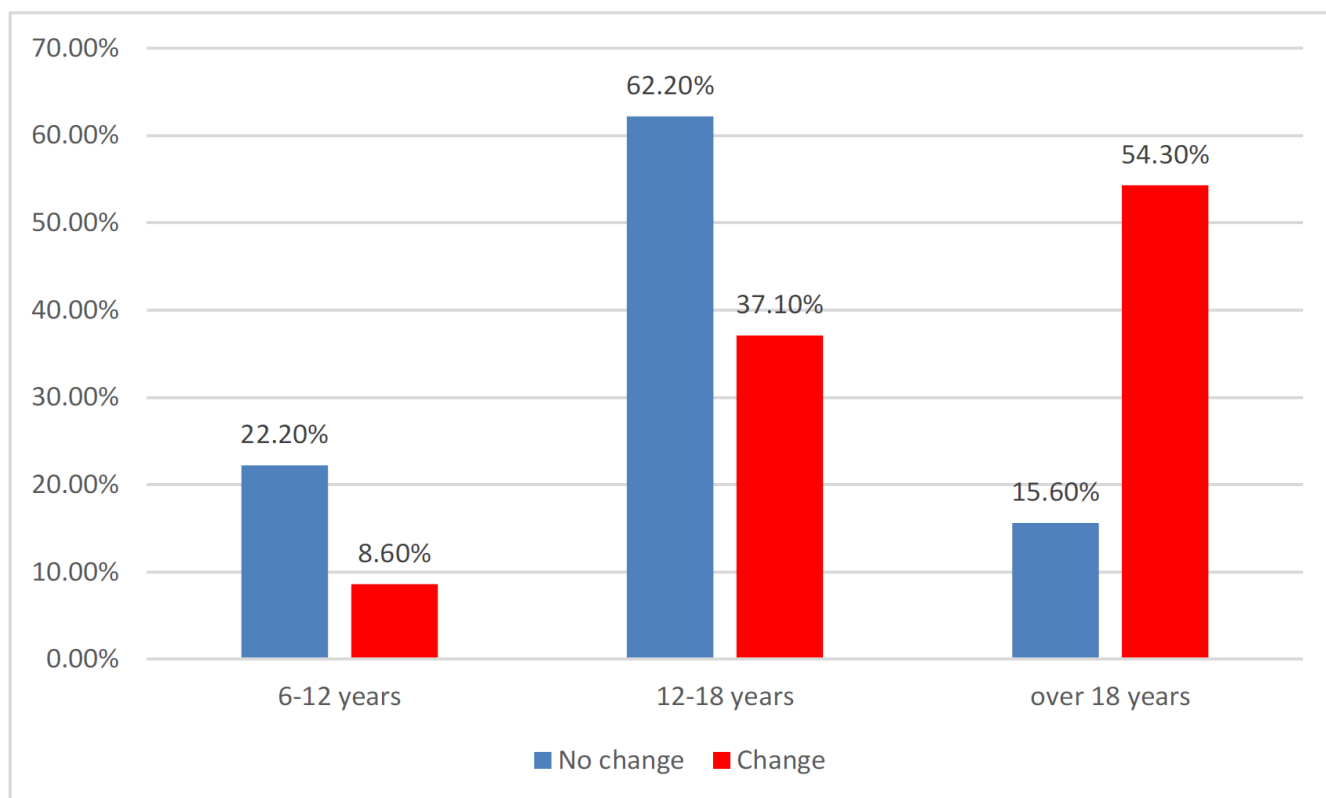


Figure 1. The distribution of orthodontic patients considering age and any change of eating habits after activating the orthodontic appliance

his eating habits after activating the orthodontic appliance and any weight loss.

The obtained results were included in tables using Microsoft Excel and the statistical analysis was performed using IBM SPSS Statistics 20. The qualitative variables were tested using the Fisher's Exact Test/Pearson Chi-Square, any correlation being proved by using the Pearson correlation coefficient. Z tests with Bonferroni correction were performed to detail the results obtained in testing the qualitative variables.

Results

The data included in Figure 1 shows the distribution of the orthodontic patients considering age and any change of eating habits after activating the orthodontic appliance. The differences between the age groups were tested using the Pearson Chi-Square Test, the results proving to be statistically different ($p < 0.001$). The positive correlation of medium severity ($p < 0.001$, $R = 0.383$) and Z tests with Bonferroni correction show that among the patients from the 6-12 years age category and those from the 12-18 years age category, the proportion of those without any change in their eating habits (22.2%/62.2%) is significantly higher than the proportion of patients who changed their eating habits (8.6%/37.1%). On the other hand, among orthodontic patients over 18 the proportion of patients who changed their eating habits (54.3%) is significantly higher than those who did not change their diet (15.6%) (see figure 1).

The data included in Figure 2 shows the distribution of the orthodontic patients considering age and weight loss after activating the orthodontic appliance. The differences between the age groups were tested using Fisher's Exact Test, the results proving

to be statistically different ($p = 0.001$). The positive correlation of low severity ($p < 0.001$, $R = 0.285$) and Z tests with Bonferroni correction show that among patients aged 6-12 years the proportion of those without any weight loss is significantly higher (21.4%) than those with weight loss (4.2%), while among patients over 18 years, the proportion of those with weight loss (50%) is significantly higher than those without any weight loss (25%) (see figure 2).

Discussion

According to our study, as orthodontic patients get older, they change their dietary habits. This emphasizes the fact that, as people get older, they tend to adapt harder and to become less tolerant to any change in their oral cavity. Thus, younger patients seem to accept easier the discomfort generated by a fixed orthodontic appliance in their mouth. Our results corroborate the findings described in previous studies (Scheurer et al 1996; Jones et al 1992; Polat et al 2005), but differ from the findings reported in another study (Scott 2008; Azaripour et al 2016). These differences may be related to cultural aspects and study design. Azaripour et al (2016) suggested that, despite the recommendations provided by the orthodontist, adolescent patients do not change their pattern of eating: more than 90% of the orthodontic patients consume chocolate daily and more than 50% of the orthodontic patients use various soft drinks daily. During the adolescent period, the nutritional needs are already stressed by growth and development as well as by the emotional stress of puberty, which is why maintaining a well-balanced diet is of great importance (Hickory et al 1981). Unfortunately,

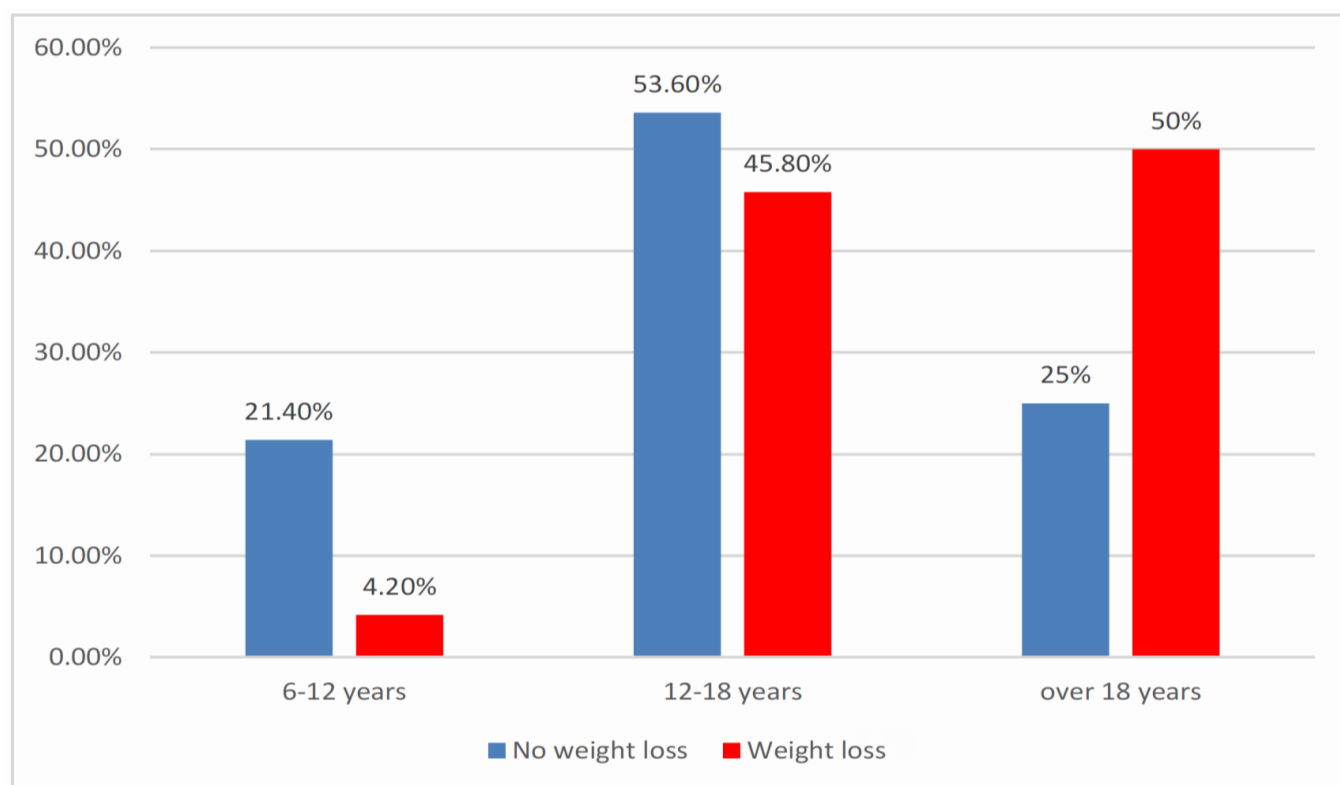


Figure 2. The distribution of orthodontic patients regarding age and weight loss after activating the orthodontic appliance

this type of patient has a high nutritional demand and a poor dietary behavior (Ajmera *et al* 2015).

Due to the fact that as people get older, they have fewer natural teeth, they become particularly vulnerable to dietary restrictions, thus changing their nutritional status (Mercenes *et al* 2003).

Patients may have unrealistic expectations regarding their eating habits, many of them declaring that they did not expect that the orthodontic appliance might affect the food or drink they consume (Sayers *et al* 2006). The reasons reported by patients for avoiding chewing gum, fizzy drink, sweets, sticky and hard food are related to food getting stuck in their braces (Al Jawad *et al* 2012), to speaking impairment (Bernabe *et al* 2008) or to their orthodontist's advice. Thus, from the beginning of the orthodontic treatment, patients should be aware that eating with braces on can be quite a great challenge to their diet and that they might need to make important changes in their diet. In order to reduce breakages and decalcification, patients with fixed orthodontic appliances should be informed that their meals are more likely to take longer, that eating can be messier and that chewing may be sometimes difficult (Carter *et al* 2015).

Eating issues related to orthodontic treatment may predispose adolescent patients to have a maladaptive behavior that can trigger or maintain an eating disorder. (Lee *et al* 2015). Several studies reported that before developing anorexia nervosa, a number of patients started an orthodontic treatment (O'Reilly *et al* 2014).

Our results show that, as an orthodontic patient gets older, he loses more weight compared to younger patients. Due to the strongly connection between the psychological state of a patient and an orthodontic treatment, patients should be continuously evaluated regarding depression and anxiety while wearing an orthodontic appliance (Albino *et al* 1991; Topcuoglu *et al* 2014).

Some studies report that changes in the weight, body mass index are frequently accompanying orthodontic treatment. These weight alterations can be easily observed at the end of the 1st month of orthodontic treatment, but at the end of the 3rd month of treatment patients do not regain their original weight (Sandeep *et al* 2016).

Conclusions

As people get older, they tend to adapt harder and to become less tolerant to any change in their oral cavity. Thus, younger patients seem to accept easier the discomfort generated by a fixed orthodontic appliance in their mouth. Also, as an orthodontic patient gets older, he loses more weight compared to younger patients.

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Citation Negrutiu BM, Todor BI, Moca A, Vaida LL, Judea-Pusta C. Dietary habits and weight loss in orthodontic patients. *HVM Bioflux* 2019;11(2):57-60.

Editor Antonia Macarie

Received 20 March 2019

Accepted 2 April 2019

Published Online 4 April 2019

Funding None reported

**Conflicts/
Competing
Interests** None reported