ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF RESEARCH IN PHARMACEUTICAL SCIENCES

Published by JK Welfare & Pharmascope Foundation Journal Home Page: https://ijrps.com

Patient response to the usage of orthodontic appliance in patients undergoing orthodontic treatment - A survey

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Article History:

Received on: 10 Aug 2020
Revised on: 20 Sep 2020
Accepted on: 25 Sep 2020

Keywords:

Orthodontic Appliances, Functional, Questionnaire

ABSTRACT

To evaluate the patient perception of orthodontic appliances and their experience during orthodontic treatment. Patient data archived in the institution's database were reviewed and data pertaining to patients undergoing orthodontic treatment was retrieved. 60 patients were identified randomly. A questionnaire was framed to record the patient's compliance to functional appliance therapy. The questionnaire survey was framed and sent to the patient by sharing the link of the survey planet that consists of necessary context. Chi-square, fisher exact tests were used for data analysis through SPSS software. It was found that patients needed more time to the orthodontic appliance. 66% of patients had eating difficulties, 63.3%. More than half of the patients encountered oral sores almost 57.7%. 64% of the patients using these appliances encountered breakage and displacement problems. A total of 54% of patients stated that they had difficulty in keeping the appliances clean and maintaining proper oral hygiene Individuals undergoing orthodontic treatment had more difficulty to perform routine activities. Care must be taken to overcome these difficulties.

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ISSN: 0975-7538

DOI: https://doi.org/10.26452/ijrps.v11iSPL3.3368

Production and Hosted by

IJRPS | https://ijrps.com

INTRODUCTION

Malocclusion is a common dental discrepancy that is the result of skeletal discrepancy such as prognathic maxilla, mandible, retrognathic maxilla, mandible or both (Namara and Namara, 2019). Orthodontic appliances need much patient cooperation (Proffit *et al.*, 2014). These appliances have their own advantages and disadvantages in regards to the oral hygiene and soft tissue irritation (Clark, 2014). These effects of orthodontic treatment on the skeletal (Sivamurthy and Sundari, 2016; Vikram, 2017; Kamisetty *et al.*, 2015) and dental tissues have been heavily investigated (Viswanath *et al.*, 2015; Kumar *et al.*, 2011; Felicita, 2017a). Effective treatment with orthodontic appliances involves proper diagnosis (Rubika *et al.*, 2015; Samantha *et al.*, 2017; Krishnan and Pandian, 2015; Felicita, 2018) treatment planning and treatment mechanics (Felicita, 2017b; Kumar *et al.*, 2011; Dinesh *et al.*, 2013). The perception of the patient to these appliances have been evaluated to a certain extent (Dandajena, 2010). During orthodon-

tic appliance treatment, patients may have pain and discomfort at various levels. It has been shown that these appliances can lead to oral mucosa pressure, soft tissue tension, oral constriction, toothache and pain (Celikoglu *et al.*, 2016). They may lead to fatigue or alteration in function, respiratory disorder and may affect the appearance of the individual (Freeman, 2004). Informing the patients prior to treatment about the possible problems and discomfort throughout orthodontic appliance treatment is beneficial in order to enhance the appliance efficiency and patient compliance (Nedeljkovic, 2011; Felicita *et al.*, 2012). Gradually the patient cooperation can decrease due to the irritation caused by these appliances (Wieslander and Lagerström, 1979; Kannan *et al.*, 2017).

Therefore the aim of the study was to conduct a survey with the purpose of evaluating the experience of the patient undergoing orthodontic appliance treatment.

MATERIALS AND METHODS

The patient's data was collected from the digital archives of our institution. All patients reporting to the orthodontic department between June 2019 to March 2020 were reviewed. All total of 60 patients underwent orthodontic treatment in a private dental college, Department of Orthodontics. The participants were informed about the aim of the survey and the link was shared to patient number. The online survey was prepared.

The survey questions were designed to be as simple as possible so that the participants could easily comprehend them. A total of 60 patients (mean age 23 years) participated in the study. The survey comprised 10 questions that covered issues, pain, speech problem, duration, satisfaction of the smile etc,. The survey was undertaken by patients who had already completed the orthodontic treatment. Closed ended questions with answers as yes or no were framed. The outcome was interpreted through frequency distribution using SPSS version 25.

RESULTS AND DISCUSSION

The adaptation period to orthodontic appliances was significant. Table 1 - shows the gender distribution of the patients undergoing orthodontic appliance treatment 55% were males and 45% were female (33 males and 27 females) (Figure 1). Table 2 shows the response to the survey with frequency distribution. There was difficulty in speech in 66.7% of the patients undergoing orthodontic treatment. The eating problems occurred in 61.7% and they had difficulty in deglutition. Toothache and jaw pain was also present in 63.3% of individuals. More than half of the patients encountered oral sores (57.7%). 64% of the patients using these appliances encountered breakage and displacement problems. A total of 54% patients stated that they had difficulty in keeping the appliances clean and maintaining proper oral hygiene (Table 2).

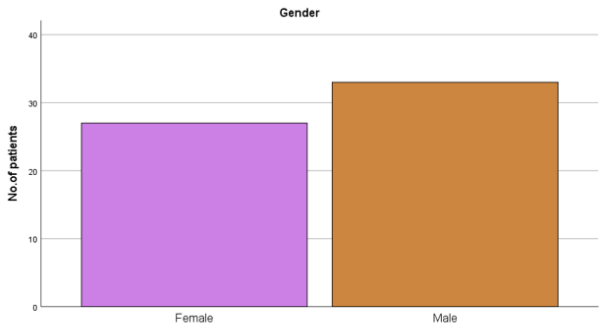

Figure 1: Bar graph showing the gender distribution of the patients who participated in the study

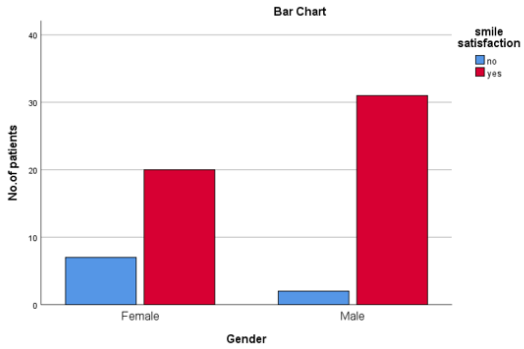

Figure 2: Represents the association between the gender of participants and the satisfaction of the smile postoperative to the treatment (Yes-pink: No-Blue)

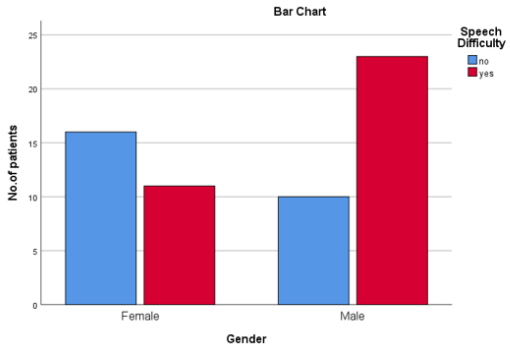

Figure 3: Represents the Association between the gender of participants and the difficulty in speech during treatment (Pink-Yes: Blue-No)

Table 1: Shows gender distribution of the patients who participated in the study. Higher number of males participated in the survey (55%)

Gender	Frequency	Percent
Female	27	45.0
Male	33	55.0
Total	60	100.0

Table 2: Survey questions and frequency distribution of patient responses

S. No.	Questions	Response	Frequency	Percent
1.	Did you wear appliance at night	Yes	40	66.7%
		No	20	33.3%
2.	Is there any difficulty in speaking during wearing appliances	Yes	34	56.7%
		No	26	43.3%
3.	Was there any irritation or ulcer during the phase of treatment	Yes	32	54.0%
		No	28	46.0%
4.	Do you use any medications to avoid pain during the treatment	Yes	38	63.3%
		No	22	36.7%
5.	Was there any difficulty in visiting dentist on their appointments	Yes	36	60.0%
		No	24	40.0%
6.	Do you find difficulty on eating during first three months of treatment	Yes	37	61.7%
		No	23	38.3%
7.	Are you able to clean the teeth and maintain oral hygiene during treatment	Yes	41	68.3%
		No	19	31.7%
8.	Are you satisfied with the smile after the treatment	Yes	51	85.0%
		No	9	15.0%
9.	Do you follow the instructions given by your dentists	Yes	51	85.0%
		No	9	15.0%
10.	Did you encountered any breakage of appliance during the treatment	Yes	38	63.7%
		No	22	36.3%

Beside all the struggles encountered during the phase of the treatment 85% of the study population were entirely satisfied with the treatment post operatively. Over 60% of the population encountered difficulties in visiting the dentist at regular appointments and following the guidelines according to their orthodontist/dentist (Table 2). Association between the gender and their satisfaction of the smile showed that males are predominantly satisfied compared to females which was statistically significant (p value=0.030)(Figure 2). The association between gender of participants and the difficulty in speech during treatment showed that the majority of the male participants find difficulty in talking during the phase of treatment when compared to females which was statistically significant (p value=0.023)(Figure 3).

In Figure 1, X-axis denotes the gender distribution and Y-axis denotes the number of patients. Higher number of males(brown) participated in the survey (55%). In Figure 2, X-Axis denotes the gender involved and Y-axis denotes the number of patients involved. Majority of the male participants are satisfied in their smile (red) when compared to females. This difference was statistically significant. (Pearson's chi-square value-4.596, p value=0.030 - statistically significant)

In Figure 3, X-axis denotes the gender of the patient and Y-axis denotes the number of patients involved. Majority of the male participants (Red) find difficulty in talking during the phase of treatment when compared to females (female), statistically significant. (Pearson's chi-square value-5.071, p value=0.023 - statistically significant).

Since patients of different age groups may respond differently to orthodontic treatment only young adults were included. The main complaints resulting from the use of appliances were pain and difficulty in speech. Increasing the number and the content of the questions may decrease the response rate

causing misinterpretations. For this reason, a survey of 10 questions was prepared and the patients were asked to evaluate their experiences in using the appliances.

In previous studies, the rationale for low patient cooperation has been reported as pain (28%) and dissatisfaction with the appearance. Likewise, Oliver and Knapman (1985); Jain *et al.* (2014); Viswanath *et al.* (2015) did not find any difference in terms of pain. These findings match up with the outcomes of earlier studies that show that orthodontic appliances cause undesired consequences due to oral pressure. The pain encountered during the course of treatment is as mentioned in earlier studies (Gu, 2016). There was also increased breakage of the brackets in the fixed appliances when compared to the removable appliance. There was an increased number of urgent appointment requests reported due to displacement and breakage of the fixed appliances in comparison with previous studies (Gu, 2016; Ishaq *et al.*, 2016). During social interactions, the mouth is one of the most attention-seeking features of the face, emphasizing the significance in the smile as a facial feature. Thus, the esthetic enhancement has become the growing reason for dental visits as it has a major role in social interactions. For an orthodontist to provide satisfactory smile corrections, knowledge of esthetics of the human face is necessary (Hata and Arai, 2016).

CONCLUSION

Based on this study, we conclude that 60% of patients had eating difficulties, and encountered ulcerations and appliance breakage during the treatment and over 50% of patients had difficulty in maintaining oral hygiene and frequent consultations to their dentist based on monthly reviews. Of all these difficulties encountered over 85% of the patients are entirely satisfied with their change over smiles.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

Funding Support

The authors declare that they have no funding support for this study.

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