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Colour preferences of patients receiving elastic ligatures in fixed orthodontic treatment

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Abstract

Introduction: Elastic ligatures are commonly used in fixed orthodontic treatment. They are used to hold arch wires to the brackets. Manufacturers fabricate elastic ligatures in a number of different colors. While colored elastic ligatures tend to be more attractive, acceptance of the use of such ligatures varies a great deal with age and gender. Although it is suggested that an orthodontist should stock at least ten different colors of elastic ligatures at all times, little is actually known about the patients' color preferences for elastic ligatures. The aim of this study was to evaluate the color preference of patients receiving elastic ligatures in fixed orthodontic treatment.

Material and Methods: One hundred patients undergoing fixed orthodontic treatment at Armed Forces Institute of Dentistry were selected for this study. A self-administered questionnaire was used to assess the patients' preference regarding elastic ligatures. Questions regarding choice of colored vs transparent ligatures, lighter vs darker shades, change of ligatures for specific occasions and the favourite color of each individual were asked. Data was analyzed using SPSS version 24.

Results: While 28% of the subjects preferred transparent ligatures, 72% preferred them colored. Of these 72, 36% preferred lighter shades while 52.7% preferred darker shades. A statistically significant difference was found between males and females in terms of color preference with $p = 0.006$ while no association of color preference with age could be found.

Conclusions: Patient preference for the ligature colours must be kept in mind when maintaining Orthodontic inventory

Keywords: Esthetics; ceramic braces; colour preference

Introduction

Elastic ligatures are commonly used in fixed orthodontic treatment. They are used to hold arch wires to the brackets.[1] Owing to their elasticity, arch wire ligation with elastic ligatures tends to be faster and easier as compared to ligation with metal ligatures.[2]

These elastomeric materials are susceptible to pigmentation when exposed to the intra-oral environment, thereby compromising esthetics.[3] To mask such a probable pigmentation, manufacturers fabricate elastic ligatures in a number of different colors. While colored elastic ligatures tend to be more attractive, acceptance of the use of such ligatures varies a great deal with age and gender.[4 5]

The long history of color preference studies has been described as "bewildering, confused and contradictory".[6] Although it is suggested that an orthodontist should stock at least ten different colors of elastic ligatures at all times,[2] little is actually known about the patient's color preferences for elastic ligatures. The aim of this study was to evaluate the color preference of patients receiving elastic ligatures in fixed orthodontic treatment. The knowledge will help the orthodontists stock and present to their patients the most popular colors. This, in turn, will have a positive influence on patient cooperation during treatment.

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Material and Methods

One hundred patients undergoing fixed orthodontic treatment at Armed Forces Institute of Dentistry were selected for this study. Patients who had been under treatment for at least 6 months were selected since they were well-acquainted with choosing ligatures. A self-administered questionnaire was used to assess the patient's preference regarding elastic ligatures. Questions regarding choice of colored vs. transparent ligatures, lighter vs darker shades, change of ligatures for specific occasions such as Eid and the favourite color of each individual were asked. Data was analyzed using SPSS version 24. Descriptive statistics were calculated. Pearson's chi-squared analysis was performed to determine the effect of gender on color preferences. $P < 0.05$ was taken as significant.

Results

Of the hundred study subjects, 24 were males and 76 were females. The mean age of study subjects was 17±4.4 years. Majority (82%) of the subjects stated that they felt motivated at the time of change of ligatures. While 28% of the subjects preferred transparent ligatures, 72% preferred them colored (Table I).

Table I: Preference of patients regarding elastic ligatures

Question	Response	
	Yes (%)	No (%)
Do you feel motivated when ligatures are to be changed?	82	18
Do you like them in different colors? (Yes = colored, No = transparent)	72	28
Do you like to change the color of your ligatures before some occasion such as Eid?	48	52

Of these 72, 36% preferred lighter shades while 52.7% preferred darker shades (Figure 1). Figure 2 shows the colors most popular with patients for elastic ligatures. A statistically significant difference was found between males and females in terms of color preference with P = 0.006 (table 2) while no association of color preference with age could be found (Table III). Females were found to be more adamant about choosing colored elastic ligatures as compared to males.

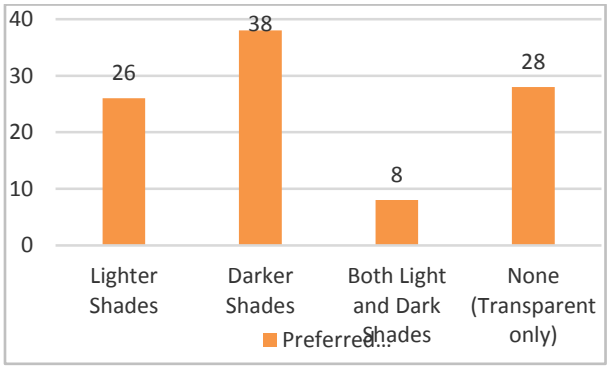

Figure 1: Patients' preferred color shades for elastic ligatures

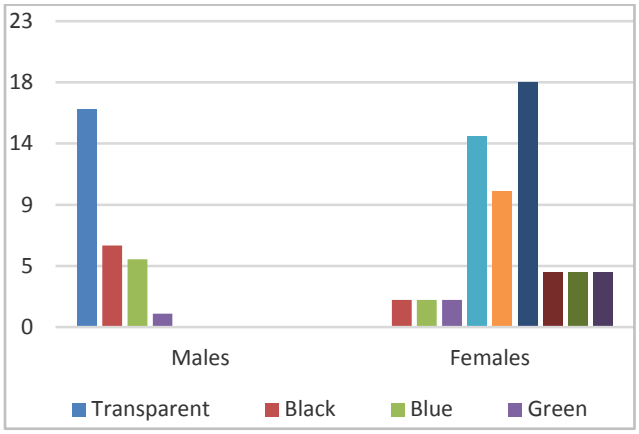

Figure 2: Colors most popular with patients for elastic ligatures

Table II: Association of color preference with gender

Gender	Ligatures		Total	P value
	Colored	Trans parent		
Male	12	12	24	0.006
Female	60	16	76	

Table III: Association of color preference with age

Age	Ligatures		P value
	Colored	Transparent	
<15 years	36	8	0.152
16-20 years	22	12	
>21 years	14	08	

Discussion

The present study had a higher percentage (76%) of female subjects as compared to males (24%). A similar gender-wise distribution was reported by Elekdag-Turk et al[2] who reported a 67.2% prevalence of female subjects while male subjects accounted for 32.8% of the study subjects.

Majority (72%) of the subjects in this survey preferred colored elastic ligatures to transparent ligatures. Elekdag-Turk et al,[2] on the other hand, reported that only 55.2% patients preferred colored elastic ligatures. This difference can be explained by the fact that Elekdag-Turk et al[2] divided ligatures into two groups in his study. Transparent ligatures and ligatures with colors such as white, pearl, and silver were defined as "less noticeable" while ligatures with more striking colors such as pink, yellow, and purple were defined as "colorful". In our study, in contrast, all colors including white, silver and grey were considered as being colored ligatures. Hence, a higher preference for colored ligatures was seen in this study.

A significant difference was found between males and females in terms of color preference for elastic ligatures (P = 0.006). Female subjects showed a higher predilection for choosing colored elastic ligatures as compared to men who showed an equal predilection for colored and transparent ligatures. Elekdag-Turk et al,[2] however, found no differences in color preferences of male and female patients. Gender has been shown to influence color preferences. Hurlbert and Ling[6] supported the view that color preferences among the sexes have a biological basis, i.e. an evolutionary basis. Most popular colors of elastic ligatures among the patients in this study were blue, purple, pink, red and black. Yellow, green, white and silver/grey were liked to a lesser extent. Females chose pinks and purples while males preferred blues and black. This finding is endorsed by neuroscientists who report that females prefer red–purple colored tones while males prefer blue–green-colored tones.[6]

Elekdag-Turk et al[2] found an association of age with color preference. He found that patients less than 15 years old preferred colored ligatures while those older than 21 years old opted for less noticeable ligatures. A similar analysis was carried out in the present study by sorting the patients into three groups of <15 years, 16-20 years and >21 years. However, no significant differences were observed between the color preferences among patients of different age groups (P = 0.152).

The present study aimed to assess the color preference of patients receiving elastic ligatures during fixed orthodontic treatment. Literature on this subject is scarce. The only similar study in the literature reporting on color preference regarding elastic ligatures was done by Elekdag-Turk et al.[2] This makes the present survey first of its kind, building up on the data concerning the preferences of patients from the local population. However, there is a need to carry out similar studies with a larger sample size and greater ethnic diversity.

Conclusions

Within the limitations of this study, following conclusions can be drawn:

1. Majority (72%) of the patients receiving fixed orthodontic treatment prefer colored elastic ligatures over transparent ligatures.

2. A significant difference was found between males and females in terms of color preference of elastic ligatures with more females favoring colored ligatures.
3. Females preferred colors in the red-pink-purple tones while males preferred blue-black colored tones.

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