

COLOUR PREFERENCE OF THE PATIENTS OF DIFFERENT AGE GROUPS RECEIVING ELASTIC LIGATURE DURING FIXED ORTHODONTIC TREATMENT

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ABSTRACT

Objectives: To determine the colour preferences of patients of different age groups receiving elastic ligatures during fixed-appliance orthodontic therapy. **Method:** 120 patients with metal brackets (60 female and 60 male) with age group of 1) 15 year and below, 2) 16-20 years, 3) 21 year and above were included, and their colour preferences for elastic ligatures were recorded on rating scale from 1 to 10 for each colour using intraoral and extraoral photographs. Kruskal Wallis test, Mann-Whitney U test was performed to evaluate the colour preferences and to determine the influence of age and gender on colour preferences ($P \leq 0.05$). **Results:** Female patients preferred strikingly colourful elastic ligatures, while male patients preferred less noticeable elastic ligatures. Significant difference was observed between the colour preferences of female and male patients and between the colour preferences of adolescents and adult patients. **Conclusions:** Female patients preferred red-pink-yellow-coloured tones, while male patients preferred blue-black-golden-clear coloured tones. Adolescents preferred colourful elastic ligatures, while adult patients preferred ligatures with less-noticeable colours. A stock of 10-12 colourful and less-noticeable elastic ligatures seem to be adequate to ensure patient satisfaction.

KEYWORDS : Colour preference; Elastic ligatures; Fixed Orthodontic therapy.

INTRODUCTION:

Elastic ligatures are commonly used in fixed orthodontic appliance treatment.¹ They are used to hold arch wires to the brackets.² Archwire ligation performed using elastic ligatures is faster as compared to use of ligature wire for the same. Moreover, the availability of elastic ligatures with different colours facilitates active patient involvement in the treatment process, which may have a positive influence on patient cooperation during treatment. However, not much information is available on the effect of gender and age of the patient on colour preferences for elastic ligatures. Which colours of elastic ligatures should orthodontist stock and present to their patients? A comment on this subject has suggested that about 10 colours should be stocked at all times.¹

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 colours, while coloured elastic ligatures tend to be more attractive and acceptable for the use of such ligatures.^{4,5}

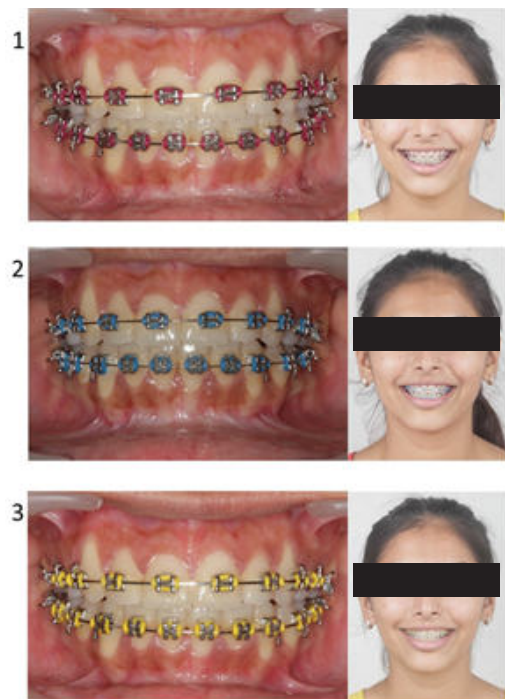
To elucidate this aspect of fixed appliance orthodontic therapy, the colour preferences for elastic ligatures among patients receiving fixed orthodontic appliances were determined and the influence of age and gender on these preferences was evaluated in our study. This will help the orthodontist to stock and present to their patients the most popular colours. This, in turn, will have a positive influence on patient cooperation and participation during treatment.

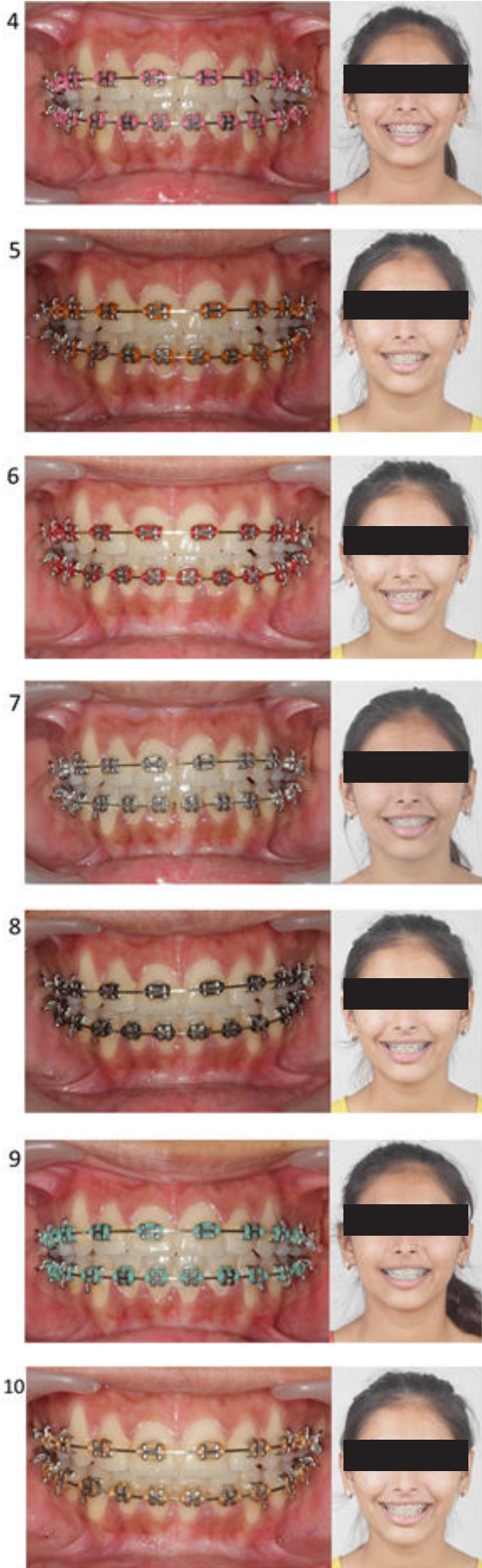
MATERIAL AND METHOD:

120 patients (60 female and 60 male) were included in this study. Three age groups were taken 1) 15 years and below, 2) 16-20 years, 3) 21 years and above. Each group had equal number of male and female patients. Patients who had received metal brackets and had completed at least 4 months of fixed-appliance orthodontic treatment were included, because, in comparison with the patients in the earlier stages of treatment, these patients were more experienced and

interested in choosing ligatures. The colour preferences of the patients were recorded using an intraoral and extraoral photographs taken with 10 different colours of elastic ligatures ligated in patient's mouth with metal braces. On the scale of 1 to 10 Rating were recorded for each colour.

Transparent ligatures and ligatures with colours such as white, pearl, and golden were defined as "less noticeable," while ligatures with more striking colours such as pink, yellow, red and blue were defined as "colourful." Kruskal Wallis test was performed to evaluate the colour preferences and to determine the influence of age and gender on colour preferences.





RESULTS:

Table 1: Overall Age Groups Wise Comparison

COLOUR	VAS Score (Median) in age groups			P Value
	15 YEARS AND BELOW	16 TO 20 YEARS	21 YEARS AND ABOVE	
DARK PINK	4	4.5	5	> 0.05**
BLUE	7	6	4	≤ 0.05*
YELLOW	3	4	3	> 0.05**
LIGHT PINK	4	5	3.5	> 0.05**
ORANGE	5	4	3	≤ 0.05*
RED	8	7	3	≤ 0.05*
CLEAR	10	8	9	> 0.05**
BLACK	5	8	4	≤ 0.05*
GREEN	4	4	4	> 0.05**
GOLDEN	5	3	7	≤ 0.05*

Level of Significance P ≤ 0.05, * Significant Result, ** Non significant Result

Median score of rating of all study subjects, aged 15 years & below, 16 to 20 years and 21 years & above is summarised in table. Statistically, significant difference was observed in preference among age groups who had chosen Blue, orange, red, black and golden elastic Ligature.

For the rest of the colours, statistically, no significant difference was observed among age groups.

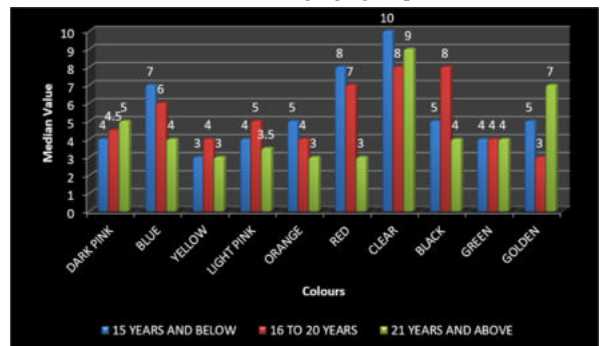


Table 2: Overall Gender Wise Comparison

COLOUR	VAS Score (Median) in gender		P Value
	Male	Female	
DARK PINK	4	6	≤ 0.05*
BLUE	6	5	> 0.05**
YELLOW	3	3	> 0.05**

LIGHT PINK	4	4.5	≤ 0.05*
ORANGE	4	4	> 0.05**
RED	7	6	> 0.05**
CLEAR	9	9	> 0.05**
BLACK	7	5	≤ 0.05*
GREEN	4	4	> 0.05**
GOLDEN	4	6	≤ 0.05*

Level of Significance P ≤ 0.05, * Significant Result, ** Non significant Result

Median score of ratings given by male and female study subjects is summarised in table. Statistically, significant difference was observed in preference among male and female patients who had chosen Dark Pink, light pink, black and golden coloured elastic Ligatures.

For the rest of the colours, statistically, no significant difference was observed in preference among male and female patients.

Table 3: Gender Wise Distribution In 15 Years And Below

COLOUR	VAS Score (Median) in gender		P Value
	Male	Female	
DARK PINK	2	9	≤ 0.05*
BLUE	8.5	6	≤ 0.05*
YELLOW	2.5	3	> 0.05**
LIGHT PINK	2	8	≤ 0.05*
ORANGE	7	4.5	> 0.05**
RED	8	8	> 0.05**
CLEAR	10	9	> 0.05**
BLACK	8	4	≤ 0.05*
GREEN	4	4	> 0.05**
GOLDEN	3	8	≤ 0.05*

Level of Significance P ≤ 0.05, * Significant Result, ** Non significant Result

Median score of ratings given by male and female study subjects of age 15 years and below is summarised in table. Statistically, significant difference was observed in preference among male and female patients who had chosen Dark Pink, blue, light pink, black, and golden coloured elastic Ligature.

For the rest of the colours, statistically, no significant difference was observed in preference among male and female patients.

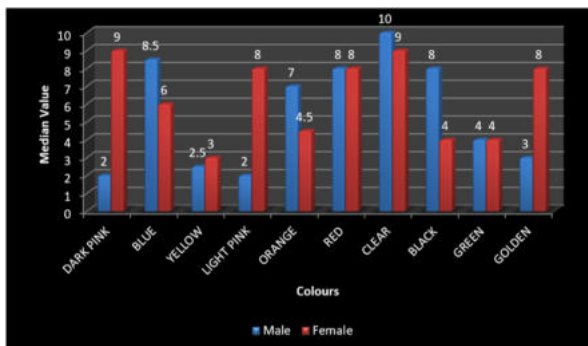


Table 4: Gender Wise Distribution In 16 To 20 Years

COLOUR	VAS Score (Median) in gender		P Value
	Male	Female	
DARK PINK	3	8	≤ 0.05*
BLUE	3	7	≤ 0.05*
YELLOW	3	7	≤ 0.05*
LIGHT PINK	4	8	≤ 0.05*
ORANGE	4	4	> 0.05**
RED	7	7	> 0.05**

CLEAR	9	8	≤ 0.05*
BLACK	8	9	> 0.05**
GREEN	3	4	> 0.05**
GOLDEN	3	4	> 0.05**

Level of Significance P ≤ 0.05, * Significant Result, ** Non significant Result

Median score of ratings given by male and female study subjects of age 16-20 years is summarised in table. Statistically, significant difference was observed in preference among male and female patients who had chosen Dark Pink, blue, yellow, light pink and clear elastic Ligature.

For the rest of the colours, statistically, no significant difference was observed in preference among male and female patients.

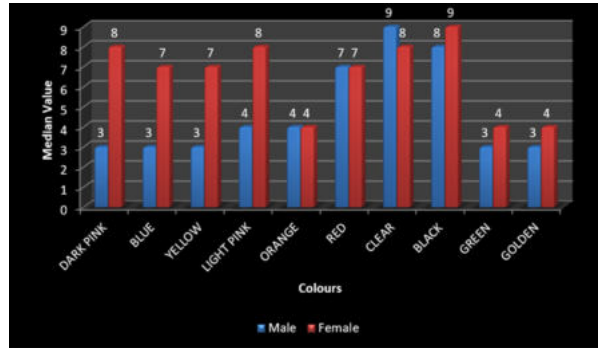


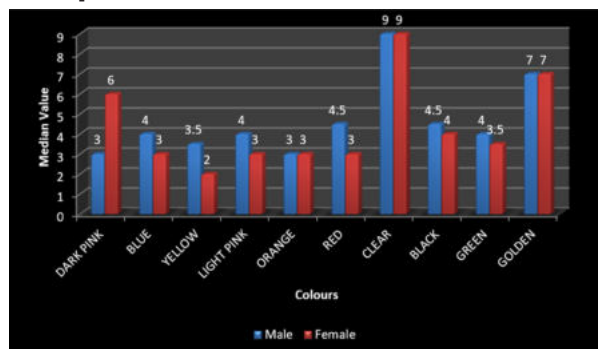
Table 5: Gender Wise Distribution In 21 Years And Above

COLOUR	VAS Score (Median) in gender		P Value
	Male	Female	
DARK PINK	3	6	≤ 0.05*
BLUE	4	3	≤ 0.05*
YELLOW	3.5	2	≤ 0.05*
LIGHT PINK	4	3	≤ 0.05*
ORANGE	3	3	> 0.05**
RED	4.5	3	≤ 0.05*
CLEAR	9	9	> 0.05**
BLACK	4.5	4	> 0.05**
GREEN	4	3.5	> 0.05**
GOLDEN	7	7	> 0.05**

Level of Significance P ≤ 0.05, * Significant Result, ** Non significant Result

Median score of ratings given by male and female study subjects of age 21 years and above is summarised in table. Statistically, significant difference was observed in preference among male and female patients who had chosen Dark Pink, blue, yellow, light pink and red elastic Ligatures.

For the rest of the colours, statistically, no significant difference was observed in preference among male and female patients.



DISCUSSION:

Gender has been shown to influence colour preferences². Usually females prefer red–purple–pink coloured tones, males prefer blue–green–black coloured tones³. Neuroscientists Hurlbert and Ling² supported the view that colour preferences among the sexes have a biological basis, i.e., an evolutionary basis, rather than a cultural basis. The results of Alexander's study implied that females prefer reds since their eyes are attuned to perceive reds better than the other colors³. This finding supports Hurlbert and Ling's idea of an evolutionary basis for colour preferences. Nevertheless, researchers at Princeton University suggest that colour preferences are influenced by a combination of biological and cultural biases⁴. However, in the present study, the differences between the colour preferences of female and male patients were significant. Female patients showed a slightly higher preference for colourful elastic ligatures, while male patients showed equivalent preferences for colourful and less-noticeable elastic ligatures depending on their age group. Among the less-noticeable colours and transparent ligatures as well as red and black colours were preferred by both female and male patients in adult and adolescent age groups respectively. In fact, the preferences for transparent ligatures were almost equal among female and male patients, and its preference was increasing with increasing age group. Detailed analysis of the preferences for colourful ligatures between all the age groups showed significant difference in colours like blue, orange, red, black and golden. From this we can reveal a high preference for colourful ligatures among adolescents, on the other hand none of adults (age, 21 years and higher) preferred colourful ligatures. When we did the analysis to compare gender wise preference among all age groups significant difference was found between dark pink, light pink, black and golden. This showed that female patients usually preferred pink, purple, and blue ligatures. In contrast, male patients usually preferred blue, black, clear and golden ligatures. The preference for red and black among male patients can be attributed to the association of the colour with their favourite football teams. Another noteworthy finding was that transparent ligatures were mainly preferred by all age groups. This high preference may be explained by the desire to make the fixed orthodontic appliance less visible or to camouflage the appliance. This preference can be considered to be influenced by peer pressure and the aesthetic concerns associated with the use of metal brackets.

CONCLUSION:

Female patients preferred red-pink-yellow-coloured tones, while male patients preferred blue-black-golden-clear coloured tones. Adolescents preferred colourful elastic ligatures, while adult patients preferred less-noticeable elastic ligatures. A stock of 10–12 colourful and less-noticeable elastic ligatures seem adequate for patient satisfaction.

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