

Shade Matching in Fixed Partial Denture Patients

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Abstract

Shade matching is a significant process in fixed dental prosthesis where the selection needs special attention and systemic approach in covering all aspects. It is a fact that this approach is mainly used for achieving the goals related to the morphological and optical acceptance within the community settings. A total of 960 patients were taken and analysed for shade matching in fixed partial denture. The data collection is done from the dental archives of the patient management software system. The study is done under university setting. The results were analysed using SPSS software version 20 by IBM. The result observed is that there is a highly achieved shade match with positive correlation and significant values ($p < 0.05$) in the fixed partial denture patients. From the overall study it was found that quality of shade match in fixed partial dentures is clinically good. Special attention and effort to be performed during shade selection to get accurate shade match in fixed dental prosthesis.

Keywords :Aesthetics; Shade match; Shade selection.

Introduction

Colour matching in aesthetic restorative material with the natural teeth is the common approach in shade matching.^{1,2}The aesthetic success is dependent upon the close shade matching between the dental restoration and the adjacent teeth^{3,4}.The shade matching is done to adapt restoration with the surrounding tissues^{5,6,7,8}. The demanding aspect within the aesthetic dentistry is regarding the duplication and characterisation of colour^{5,9,10}.The shade perception is psychophysiological response it is regulated by the human eyes and sensory structures of brain towards the reflection of light spectrum from any object^{2,11,12}.Some elements give direct demand and impact on the colour of a restoration^{13,14}.The common elements that gives impact includes lightning conditions, thickness of porcelain, soft tissue colour, core material, soft tissue shade selection system, firing process and fabrication^{15,16,17}. The judgement made on shade selection has some factors that include ambient light, surrounding colour, clothes, makeup of the patient and chromatic perception of the dentist^{18,19,20}.These factors results in frequent errors while performing shade selection^{21,22}There are various approaches in shade selection method which is used for aesthetic success

in shade match^{23,24}.The study was to determine shade matching in fixed partial denture patients^{25,26}

Materials and Methods

The study is done in a university setting. This study was approved by the institutional ethics board. Two reviewers are involved in the study. These samples were taken from patients who checked in the clinic from June 2019 to April 2020.Total number of sample data included 960 patients who were subjected to fixed partial denture treatments. The case sheets were verified with the help of photographic examination and interim procedure notes. To minimize the sampling bias we included all the data available and there was no sorting of data done. Internal validity of the study included all those undergoing fixed partial denture treatment. The external validity of the study is to find the replication of results in different time periods. Data collection was done from the dental archives of the patient management software system patented by Saveetha Dental College. The data obtained from the category fixed dental prosthesis, shade match criteria and the data is tabulated. The data was reviewed by one external reviewer. The data was imported to SPSS software and the variables were

defines. Chi square test was done on the data obtained using SPSS software version 20 by IBM. The age and gender were independent variables and shade match was dependant variable. Correlation and association type of analysis was done.

Results and Discussion

The best shade selection increases the natural appearance of a shade and the acceptance of the prosthesis. The data collected from the patient management software were tabulated in SPSS and the descriptive method statistics were obtained. Out of 960 patients,39 were in age group 18-20,241 were in age group 20-30 years,317 were 30-40 years,171 were 40-50 years,129 were 50-60 years,48 were 60-70 years,15 were 70-85 years. The frequencies calculated are tabulated and depicted in (Table 1 and Table 2) .Chi square test was done between age group and colour match. Results showed statistically significant differences in shade matching among the groups,($P < 0.001$).with very good and good shade matching being the most predominant ones (Figure 1).The results obtained states that the shade match is highly achieved and it consensus with

the study by ^{16,26,7} which states that the shade match in the age group has high satisfactory population with very low crevice in shade match of the fixed partial dentures.

According to the study of ^{27,28}the clinical steps in managing the predictable colour management in the aesthetic restorative dentistry depicts the results where the shade selection was accurate in the limited cast group selected and natural appearance was obtained. An understanding of the science of colour, shade perception and their modification is important if success must be attained in expanding field of aesthetic dentistry^{29,30}. The shade match is highly achieved in sextant two as the anterior perception of shade match plays a very important role in the aesthetic appearance of the patient ^{31,32}.The shade matching is performed visually using dental shade guide. The guide used in study is VITA which is the most popular guide and it gives best results which is accurate.³³

From the present study it was observed that shade match is highly achieved in all age groups in fixed partial denture patients.

Table 1 : Table Depicts the Total Number of Patients According to Each Age Group.

Age Group	Total
18-20	39
20-30	241
30-40	317
40-50	171
50-60	129
60-70	48
70-85	15
	960

Table 2 : Table Depicts the Total Number of Patients Showing the Frequencies of the Shade Match

Age Group	Very Good Shade Match	Good shade match	Slight mismatch	Obvious mismatch	Gross mismatch
18-20	18	18	3	0	0
20-30	94	134	13	0	0
30-40	130	156	25	5	1
40-50	73	91	7	0	0
50-60	50	54	24	1	0
60-70	21	25	1	0	1
70-85	2	12	1	0	0

Shade matching in Fixed Partial Dentures across age groups

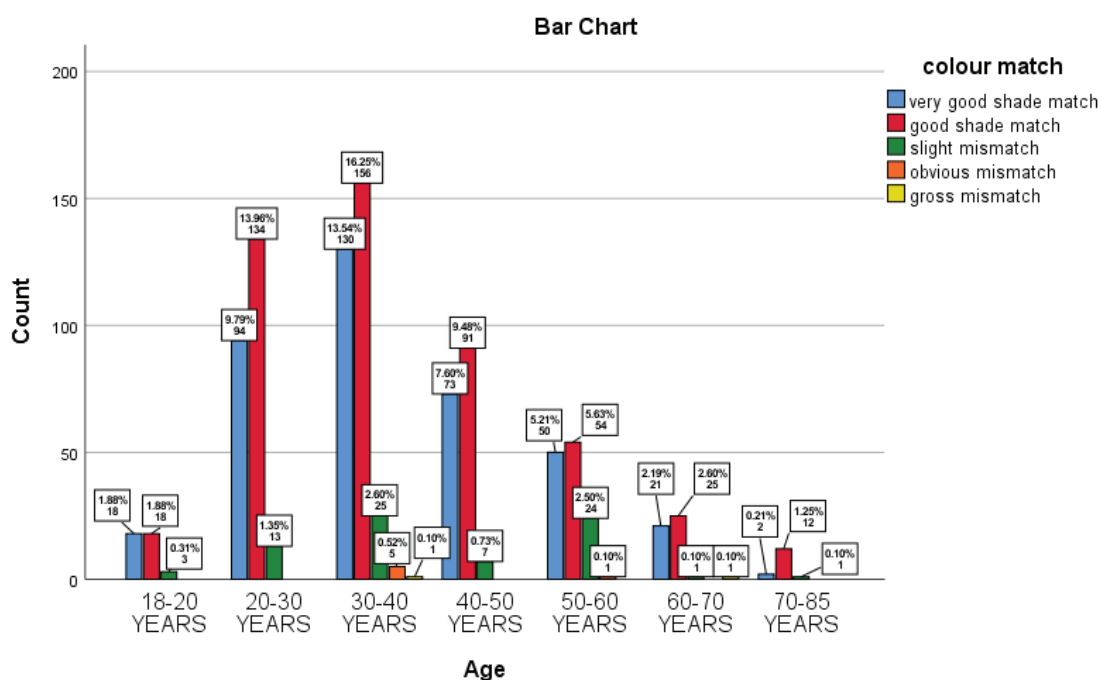


Figure 1 : Bar graph showing the frequencies of the shade match depending upon the age groups of the patients. the Frequencies of shade match are plotted in Y axis and the number count of patients Depending on the age group is plotted in X Axis. the Shade Match frequencies are represented as very good shade match denoted by colour Blue, good shade match is denoted by colour Red, slight mismatch is denoted by colour Green, obvious mismatch is denoted by colour Orange and gross mismatch is denoted by colour Yellow. There is statistically significant differences in shade matching among the groups, with very good and good shade matching being the most predominant ones.(Pearson Chi Square Test ;P<.0001).

Conclusion

From the present study it was observed that shade match is highly achieved in all age groups in fixed partial denture patients. Shade matching done for fixed

partial dentures in patients who responded in this study was very satisfactory. Shade matching is important stage of prosthetic work and in fixed dental prosthesis. The traditional methods and the new methods offered by the technical advancements should be factored in

for appropriate shade selection in fixed partial dentures. The layers, degree of translucency, opacity and the way colours are reflected will make the process of shade selection and manufacturing of prosthesis more skill demanding to achieve the aesthetically attractive results. Special attention and effort to be performed in shade selection to get accurate shade match in the fixed dental prosthesis.

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Conflict of Interest: None declared.

Ethical Clearance: It is taken from “Saveetha Institute Human Ethical Committee” (Ethical Approval Number- SDC/SIHEC/2020/DIASDATA/0619-0320)

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