

Original Article

A Study to Analyze the Paramount Way of Shade Selection among Restorative Dentists in South Canara District, Karnataka

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Abstract

The most propelling force in dentistry today is the exigency for esthetic services. In today's dentistry restorations are expected to mimic not only the shade of natural dentition, but also the translucency, opacity, and shade distribution of real tooth. Our patients expect that the restoration can recreate nature perfectly, repeatedly and precipitously. Today's dentistry is mostly related to esthetic or expected to be esthetic by patients. No matter what type of restoration it is, it is expected to color match the existing teeth.

In the present study subjects participated were faculty and post graduate doctors in the field of restorative dentistry in and around Mangalore city. A comprehensive questionnaire was used as a tool to gather the data which was analyzed later.

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Introduction

In the incredibly growing field of restorative dentistry an understanding of the color perception and color of science is very significant. Shade matching is one of the fields of restorative dentistry that can be identified as debatable of an untrained eye. Patients are currently demanding esthetic replacement that must match their existing dentition, and are more concerned about the shade match of their restorations.^{1,2}

The dentist should know the language of color and light characteristics to accurately convey the information to the laboratory². Due to certain limitation during color match, making a perfect color match is still unattainable. However, a congruous restoration can always be attained. Shade selection should be achieved in a meticulous and organized manner. Esthetic dentistry challenges the artistic ability of the dentist and technician, therefore knowledge of the underlying scientific principles of color and other optical effects is indispensable.³

Hence this study was taken up to discuss the basics of color and help dentist convey shade in a more effortless and precise way⁴.

Materials and Methods

A structured questionnaire (annexure 1) with various factors affecting shade matching was prepared. After obtaining permission from two departments of various institutions, it was distributed among the faculty and post graduate students of Prosthodontics and Conservative dentistry departments. They were requested to fill in the details regarding the questions pertaining to the shade selection in the clinical set up. The data obtained from these questionnaires were assimilated and studied:

1. College wise distribution
2. Designation wise distribution.
3. Department wise distribution.
4. Gender wise distribution
5. Experience in dentistry

6. On the basis of time of shade selection
7. On the basis of removal of facial cosmetics
8. On the basis of light preference during shade selection
9. On the basis of team involved in shade selection
10. On the basis of procedure of shade selection
11. On the basis of time taken for shade selection
12. On the basis of part of tooth utilized for shade matching
13. On the basis of usage of unit light
14. On the basis of removal of stains and debris
15. On the basis of prescription of different shades for different parts of the tooth
16. Understanding the significance of letter and number on the shade guide
17. Inquisitiveness in attending CDE program on shade matching in the future

Figure 1 : College wise distribution of population

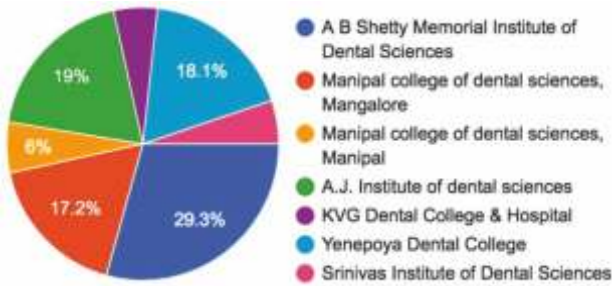


Figure 2 : Designation wise distribution

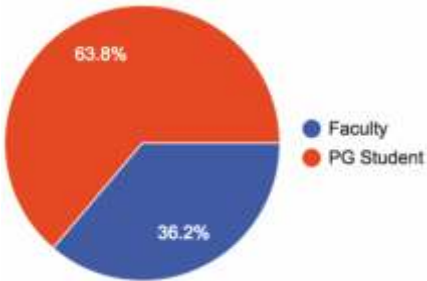


Figure 3 : Department wise distribution

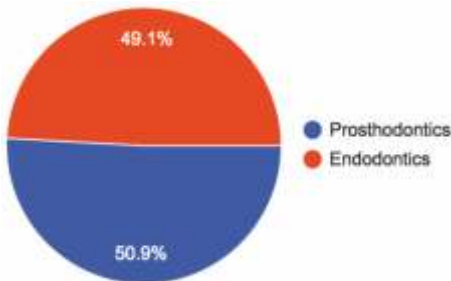


Figure 4 : Gender wise distribution in population

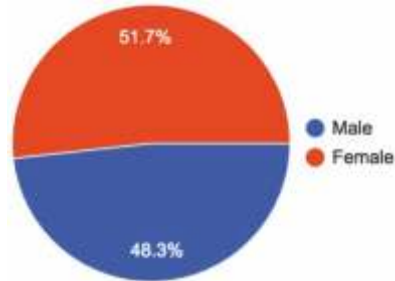


Figure 5 : Experience in dentistry

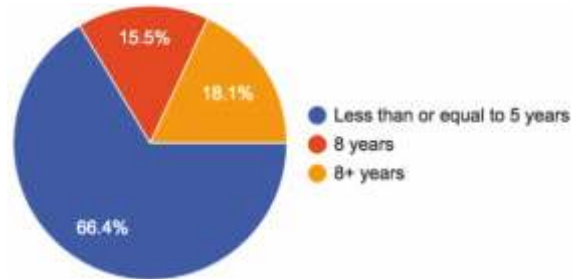


Figure 6 : Time of shade selection

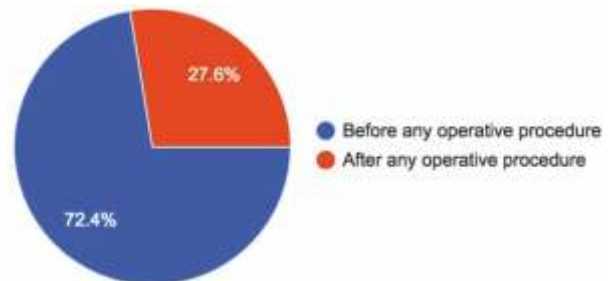


Figure 7 : Whether the facial cosmetics are removed or not?

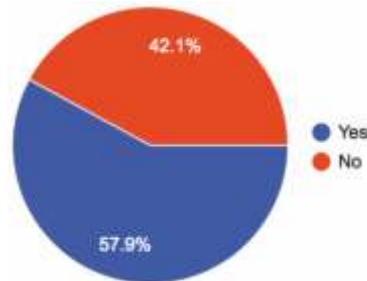


Figure 8 : Light preference during shade selection.

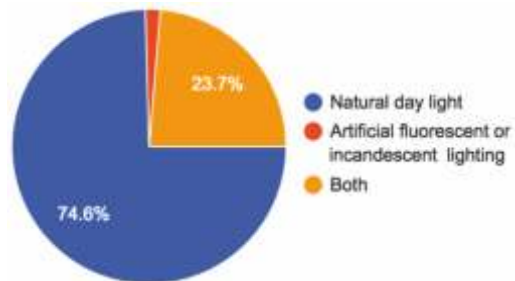


Figure 9 : Team involved in shade matching.

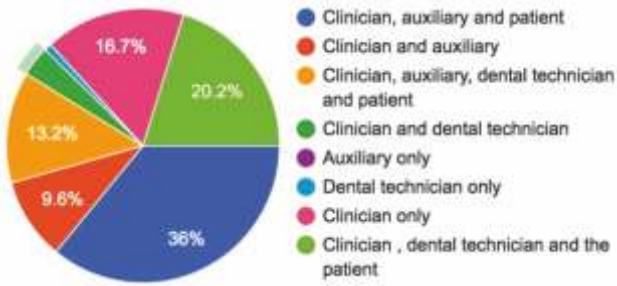


Figure 14 : Removal of stains and debris prior to shade matching.

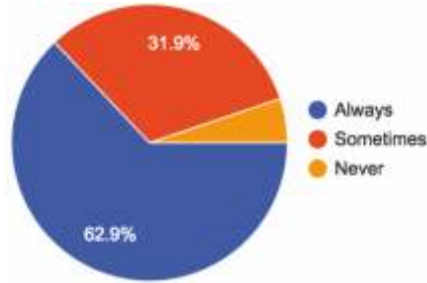


Figure 10 : Procedure of shade selection.

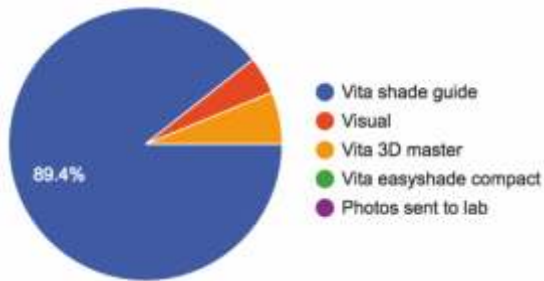


Figure 15 : Prescription of different shades for different parts of the tooth.

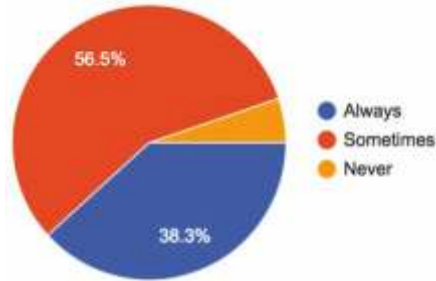


Figure 11 : Time taken for shade matching.

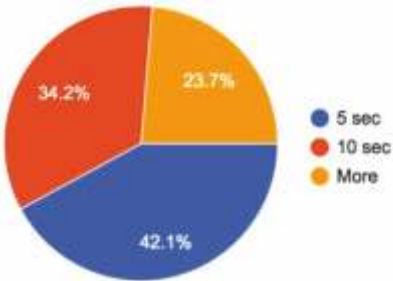


Figure 16 : Understanding of the significance of the letter on the shade guide tab with regard to shade matching?

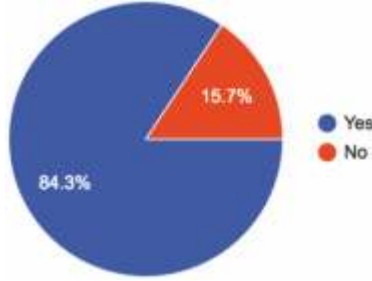


Figure 17 : Understanding of the significance of the number on the shade guide tab.

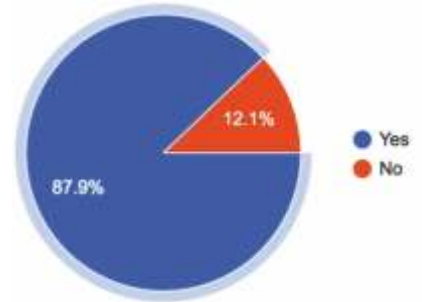


Figure 12 : Part of the tooth utilized for shade matching.

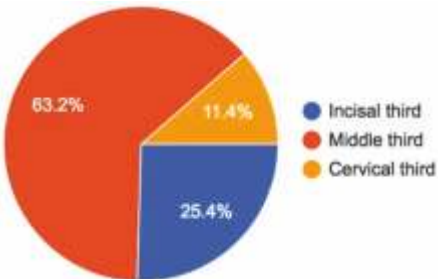


Figure 18 : Last continuing education program you attended on color and shade matching.

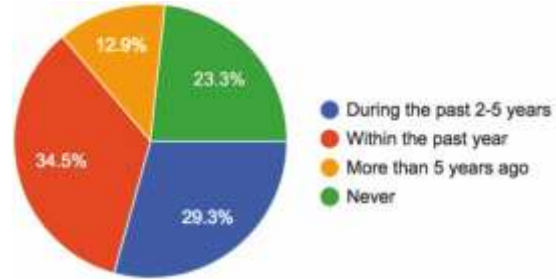


Figure 13 : Whether unit light is used or not.

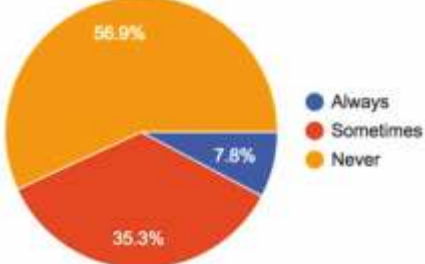
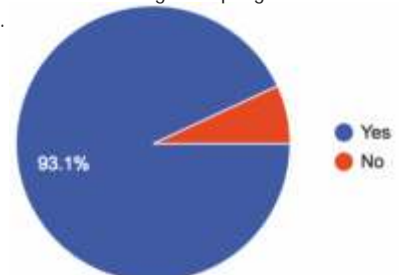


Figure 19 : Inquisitiveness in attending CDE programs on shade matching in the future.



Discussion

The present study included 42 clinicians and 74 dental students who completed the questionnaire consisting of different aspects of shade matching procedure (Figure 1 and 2).

From the study it was identified that 72.4% of the clinicians do shade selection prior to any operative procedure (Figure 6). It forms the major portion of the population and the result is in concurrence with the study carried out by Syed Rashid Habib et al. It has been said that the color of the teeth will change as they lose moisture during preparation⁷. A dry tooth looks whiter; when taking a shade, the dentist always should moisten the tooth and the shade guide⁶. Hence, selecting the shade for the final restoration prior to the tooth reduction is scientific in nature to obtain an esthetic prosthesis.

More than half of the study population (57.9%) agreed to the fact that it is ideal to ask female patients to remove cosmetics and also remove stain and debris before shade selection as they affect the apparent shade of the patient's teeth (Figure 7 and 14). The color of the lips, cheeks, tongue, palate, and gingiva reflects against and affects the color of the teeth and causes variation in the appearance of the color and shade of the teeth⁶.

Nearly 75% of the study group (74.6%) uses natural day light, 2% (1.8%) uses incandescent or fluorescent light and 27% (23.7%) uses both (Figure 8). According to the guidelines shade should be matched in both natural daylight and artificial fluorescent or incandescent light because restoration should match the natural dentition in all lighting conditions^{6 and 7}.

Majority of the dentist population involves the patient and the auxiliary during shade selection as it is important to seek a second opinion during shade determination⁶ (Figure 9)

89.4% of the population uses vita shade guide for shade selection⁶ (Figure 10). This indicates that the vita shade guide is the preferred tool for selection of the shade for

crowns in this part of the country.

42.1% of the clinician and dental students follow the idea 5 seconds of time duration for shade matching as more than 5 seconds would result in eye fatigue, hence affecting, and the accuracy of the selection (Figure 11). The longer the stare, the lower is the value of the shade⁶. Light from an object that is incident on the eye is focused in the retina and converted into nerve impulses, which are transmitted to the brain. The signals from the retina are processed by the brain to produce the psychopathological perception of color³. As neural response is involved in color vision; constant stimulation by a single may result in color fatigue and a decrease in the eyes response³. The first glance usually is the most accurate. The shade should be taken against the opposing dentition. Operator always should look at the total tooth first and later the areas⁶.

63.2% of the clinician and dental students match middle third of the tooth with the shade guide as this represents the main body color of the restoration.⁶ Because middle third of the tooth has optimal amount of enamel and dentin as color seen in a tooth depends on translucency and thickness of enamel and color of the underlying dentin⁶. (Figure 12)

56.9% do not use unit light at the time of shade matching and 62.9% remove stain from the teeth during shade matching⁶. (Figure 13)

56.5% sometimes prescribe different shades for different parts of the tooth. (Figure 15)

84.3% understand the significance of letter and 87.9% understand the significance of number on the shade guide tab. (Figure 16 and 17).

Conclusion

Within the limitations of the present study, it was concluded that the shade selection prior to the tooth preparation is the preferred mode among restorative dentists in South Canara District; Mangalore. It is agreed upon that the facial cosmetics for the female patients should be discarded before shade is selected. Regarding

the preference of the lighting conditions, it was found that majority of the population preferred the day light alone, while in the literature it is recommended that both, the day light as well as incandescent light should be used. Also most of the study group dentist did not prefer to use the unit light during shade matching. Most operators prefer both, the patient and the auxiliary personnel during the

process of shade selection. Vita shade guide was found to be favorite tool for shade selection in this group of restorative dentists. More than 50% of the study population uses middle third of the abutment for shade selection and also prefer to remove stains from the teeth during shade selection.

References

1. Hall NR. Tooth color selection: the application of color science to dental color matching. *Aust Prosthodont J* 1991; 5: 41-6.
2. Fondriest J. Shade matching in restorative dentistry: the science and strategies. *Int J Periodontics Restorative Dent*. 2003; 23: 467-79.
3. Philips science of dental materials, 12 editions, Elsevier, 31-36.
4. Chu, Stephen J.; Devigus, Alessandro; Paravina, Rade; Mieleszko, Adam *Fundamentals of Color: Shade Matching and Communication in Esthetic Dentistry*, Second Edition.
5. Habib S. Awareness of tooth shade selection principles among dental students, interns, general dentists and specialists. *pakistan oral and dental journal*. 2012; 32(3).
6. The dental clinics of North America, new techniques in esthetic and restorative dentistry, Jan 2001, W.B. Saunders Company.
7. Stephen F. Rosentiel *Contemporary Fixed Prosthodontics*, 2 Edition, The C.V. Mosby Company 1988, 380-86.
8. *Contemporary Esthetic Dentistry* George Freedman, Mosby. Inc., 2012, 135-60.