

Knowledge, attitude, and practice of dental students and practitioners on shade matching of anterior teeth

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ABSTRACT

The aim of this knowledge, attitude, and practice (KAP) survey was to study the level of awareness among the students, general dentist and practitioners in Chennai, the current status of KAP toward shade matching of anterior teeth. This study was carried out in Chennai in October 2016. The participants were divided into Group A - Endodontist, Group B – Students, and Group C - General practitioners. A survey of 250 questionnaires was handed out to participants to fill. The result shows that the common reason to do an anterior restoration was esthetic. Majority of them told light source plays a very important role in shade matching/selection as it interferes during shade selection. Almost 80.4% of dentist preferred to get an opinion from patient too during sharing selection. About 39.3% of people took 5 s do shade matching and 37.5% of people took almost 10 s to do shade matching. The color and appearance of teeth are a complex phenomenon, with many factors. Hence, for a good esthetic outcome to be achieved, the dentist should consider all possible entities which influence shade selection.

Keywords: KAP survey, shade matching, anterior teeth, restoration

Introduction

Reproducing the color of a natural tooth with artificial replacement still possesses a great challenge in modern dentistry.^[1-3] The success of restorative dentistry is principally determined based on functional and esthetic results. To achieve a good esthetic, result the four basic determinants are required are position, contour, texture, and color in order as follows. Esthetics are of great importance in anterior teeth restorations. Shade selection plays an important role to achieve with a good esthetic restoration that harmoniously blends to the natural dentition. Even though the color maybe not important to the physiologic success of a dental restoration, it plays a dominant role in patient acceptance.^[4] The knowledge of the concept of color is great importance to achieve a good esthetics and its distribution of color is very essential for dental shade matching.^[5] As esthetic

dentistry imposes several demands on the artistic abilities, knowledge of the underlying scientific principles of color is very critical. Color combination not only helps to achieve a good esthetic result but also to make sure that the restoration appears natural and attractive. Color is a result of the interaction of three dimensions known as hue, chroma, and value.^[6,7] Hue is denoted qualities that can be differentiated by color words such as red, yellow, green, blue, or purple. Chroma is a degree of saturation or the intensity of the hue such as light blue, dark blue, and royal blue. Value describes the relative brightness of colors.^[8,9] Factors influencing the tooth color may include genetic, congenital, metabolic, chemical, infectious and environmental. The shade and appearance of tooth is a heterogeneous phenomenon because many factors including lighting conditions, translucency, opacity, light scattering, gloss, and the human eye and brain influence the overall perception of the tooth color.^[10] This study was aimed at providing information on the level of awareness among the students, general dentist and practitioners in Chennai, the current status of knowledge, attitude, and practice toward shade matching of anterior teeth.

Materials and Methods

This cross-sectional survey was conducted during October 2016 including students and dentist. Response was obtained from 240 participants among which 200 dental students and 40 practitioners.

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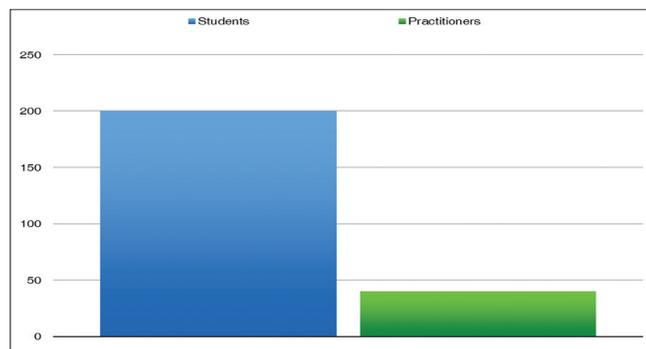
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All the responses were recorded on individual survey forms for each practitioner.

Practice survey questionnaire



- In your opinion, which of the following is essential during shade selection?
 - Knowledge
 - Talent
 - Skill
 - Individual Observer
- Which among these do you think plays a major role in shade selection?
 - Hue
 - Value
 - Chroma
 - Translucency
- Which variable affects the perception of color, the most?
 - Light source.
 - Tooth, including textures and layers.
 - Environment
 - Receiver (eye)
- What is the ideal amount of light that is required during shade selection?
 - 1000 lux
 - 1500 lux
 - 2000 lux
 - 2500 lux
- What is the ideal time required for shade selection?
 - Within 5 seconds
 - 10-15 seconds
 - 5-10 seconds
 - 15-20 seconds
- Do you think shade selection at the beginning of an appointment is better than doing it later?
 - Yes
 - No
- Do you think age, sex, and gender of the patient's play an important role in shade selection?
 - Yes
 - No
- Who according to you is more concerned about esthetics?
 - Young Males
 - Adult Male
 - Young Female
 - Adult Female
- In your opinion, what is the most common complaint patients have regarding anterior teeth restoration?
 - Esthetics correction
 - Dental caries
 - Fractured tooth
 - Failed restoration
- Do you take patients opinion while doing shade selection?
 - Yes
 - No

- Which method do you prefer during shade selection.
 - Visual (manual)
 - Instrumental (mechanical)
 - Combination of both
- If manual, under what type of light would you do shade selection?
 - Dental Light
 - Natural daylight (If so what time do u prefer?)
 - Natural and Dental Light
 - Natural Light and fluorescent light
 - Fluorescent light
- What method of isolation do you prefer while doing shade matching for anterior restoration?
 - Rubber Dam Isolation
 - Teflon Tape
 - Cotton rolls and Absorbent wafers
 - Evacuator system & saliva ejector
- While matching the shade of a tooth, it is done as
 - A Single Unit
 - Two halves
 - Cervical third, middle third, incised third
- What is the most common shade you use in your practice?
 - A1
 - A2
 - B1
 - B2
 - Combinations of color if so (what are the colors you use?)

Results and Discussion

Color is one of the most important determinants of esthetic dentistry considering various factors such as type and intensity of the light source, time of day and year, angle of incidence, and patient's clothes, age, and sex gender.^[11] Eye color, skin color, and other factors usually influence and make it difficult during shade-taking matching.^[12,13] The most common of these is the age. Even though light is one of the most important factors,^[14] it is the most commonly overlooked one. Furthermore, color imparted by different skin complexions is another factor that will have an effect on the shades of natural teeth.^[15,16]

Among the questions that were asked, majority of them told age sex, gender plays, and the appointment timing and no the least the patient opinion plays a very important role in shade selection. Moreover, among them, 59.6% of them noted manual method of shade selection and 36.8% of them chose a combination of both the methods. Moreover, when they were asked about the common most reason they come across for doing a shade selection of anterior teeth

Table 1: Results of the survey

| S.No. | Question | Result (%) |
|-------|---|---|
| 1 | In your opinion, which of the following is essential during shade selection | A. 24.6 B. 1.7 C. 24.6 D. 49.1 |
| 2 | Which among these do you think plays a major role in shade selection? | A. 35.7 B. 15 C. 29.2 D. 16.1 |
| 3 | Which variable affects the perception of color, the most | A. 69.6 B. 10.7 C. 10.7 D. 9.9 |
| 4 | What is the ideal amount of light that is required during shade selection | A. 32.1 B. 50.9 C. 15.1 D. 1.9 |

| | | |
|----|--|---|
| 5 | What is the ideal time required for shade selection? | A. 39.3 B. 37.5 C. 14.3 D. 8.9 |
| 6 | Do you think shade selection at the beginning of an appointment is better than doing it later? | A. 80.4 B. 19.6 |
| 7 | Do you thinking age, sex, and gender of the patient's play an important role in shade selection? | A. 82.5 B. 17.5 |
| 8 | Who according to you is more concerned about esthetics? | A. 5.4% B. 70.9% C. 7.1% D. 16.4% |
| 9 | In your opinion, what is the most common complaint patients have regarding anterior teeth restoration? | A. 60.3 B. 32.8 C. 5.1 D. 1.7 |
| 10 | Do you take patients opinion while doing shade selection? | A. 80.7 B. 19.3 |
| 11 | Which method do you prefer during shade selection? | A. 59.6 B. 36.8 C. 3.6% |
| 12 | If manual, under what type of light would you do shade selection | A. 3.6 B. 1.8 C. 61.8 D. 7.3 E. 10.9 F. 14.5 |
| 13 | What method of isolation do you prefer while doing shade matching for anterior restoration? | A. 22.8 B. 36.8 C. 15.8 D. 24.6 |
| 14 | While matching the shade of a tooth, it is done as | A. 24.6 B. 8.8 C. 66.7 |
| 15 | What is the most common shade you use in your practice? | A. 5.2% B. 66.2% C. 15.5% D. 6.9% E. 5.2% |

around 60.3% told esthetics while 32.3% told fracture of anterior teeth. While 22.8% of people used as rubber dam isolation while 36.8% of them preferred the use of cotton rolls and absorbing points but only 15.8% of them often the use of Teflon tape. Dental shade guides are commonly used to select the color of teeth. They are used for shade selection for the conservative esthetic restorations which are probably the most important part,^[17] and tooth shade matching is the most important clinical step during prosthetic treatment as well.^[18] While doing shade selection almost 66.7% preferred to determine shade as cervical, middle, and incisal thirds (Table 1).

Creating the ideal environment for the perception of color is possessed a challenge, and this environment does not routinely occur in a dental setup. Even in the ideal environment, the following limitations can make accurate color assessment problematic.^[19] Majority of them had difficulty while doing shade selection was mainly because of the light source as viewing shades in poor quality light will influence how color is perceived; therefore, quality of light is the most influential factor in shade taking practices. Around 39.3% of them preferred to do shade selection within 5 s while 37.5% of them take 5–10 s and 14.3% and 8.9% of them took 10–15 and 15–20 s.

Conclusion

Shade determination is more rapidly evolving toward more objective standard. The clinical importance of a proper shade selection in esthetic dentistry cannot be overlooked. Until an appropriate shade is selected, all other aspects of the restoration will not produce the best final result.

Determining an accurate shade match is one of the most vital steps in esthetic restorative dentistry, it has always possessed a great challenge in esthetic dentistry. Dentists have little or no training in vision physiology or color science as comprehensive color training has continued to be a missing part in the dental school curriculum. Dental schools do not provide adequate training for the dental students in color education.^[20,21] In an era of growing interest in cosmetic dentistry, there is a need for adequate training and communication for better and more satisfactory results of shade matching. Based on the result obtained from the current study, authors would like to conclude that more attention should be focused on improving the knowledge of color science and its application in esthetic dentistry as the color and appearance of teeth are a complex phenomenon, with many factors. Hence, for a good esthetic outcome to be achieved, the dentist should consider all possible entities which influence shade selection.

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