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

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Survey

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

**Practice survey questionnaire**

1. In your opinion, which of the following is essential during shade selection?
   A. Knowledge  C. Skill
   B. Talent  D. Individual Observer

2. Which among these do you think plays a major role in shade selection?
   A. Hue  C. Chroma
   B. Value  D. Translucency

3. Which variable affects the perception of color, the most:
   A. Light source.  C. Environment
   B. Tooth, including textures and layers.  D. Receiver (eye)

4. What is the ideal amount of light that is required during shade selection?
   A. 1000 lux  C. 2000 lux
   B. 1500 lux  D. 2500 lux

5. What is the ideal time required for shade selection?
   A. Within 5 seconds  B. 5-10 seconds
   C. 10-15 seconds  D. 15-20 seconds

6. Do you think shade selection at the beginning of an appointment is better than doing it later?
   A. Yes  B. No

7. Do you thinking age, sex, and gender of the patient’s play an important role is shade selection?
   A. Yes  B. No

8. Who according to you is more concerned about esthetics?
   A. Young Males  B. Young Female
   C. Adult Male  D. Adult Female

9. In your opinion, what is the most common complaint patients have regarding anterior teeth restoration?
   A. Esthetics correction  B. Fractured tooth
   C. Dental caries  D. Failed restoration

10. Do you take patients opinion while doing shade selection?
    A. Yes  B. No

    A. Visual (manual)  B. Instrumental (mechanical)
    C. Combination of both

12. If manual, under what type of light would you do shade selection
    A. Dental Light  B. Fluorescent light
    C. Natural daylight (If so what time do u prefer?)
    D. Natural and Dental Light
    E. Natural Light and fluorescent light

13. What method of isolation do you prefer while doing shade matching for anterior restoration?
    A. Rubber Dam Isolation  B. Cotton rolls and Absorbent wafers
    C. Teflon Tape  D. Evacuator system & saliva ejector

14. While matching the shade of a tooth, it is done as
    A. A Single Unit  B. Two halves
    C. Cervical third, middle third, incised third

15. What is the most common shade you use in your practice?
    A. A1  B. A2  C. B1  D. B2
    E. 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. Eye color, skin color, and other factors usually influence and make it difficult during shade-taking matching. The most common of these is the age. Even though light is one of the most important factors, 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.

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>
<thead>
<tr>
<th>S.No.</th>
<th>Question</th>
<th>Result (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In your opinion, which of the following is essential during shade selection?</td>
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<td>Which among these do you think plays a major role in shade selection?</td>
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<td>3</td>
<td>Which variable affects the perception of color the most:</td>
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<tr>
<td>6</td>
<td>Do you think shade selection at the beginning of an appointment is better than doing it later?</td>
<td>A. Yes B. No</td>
</tr>
<tr>
<td>7</td>
<td>Do you thinking age, sex, and gender of the patient’s play an important role is shade selection?</td>
<td>A. Yes B. No</td>
</tr>
<tr>
<td>8</td>
<td>Who according to you is more concerned about esthetics?</td>
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<td>In your opinion, what is the most common complaint patients have regarding anterior teeth restoration?</td>
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<td>10</td>
<td>Do you take patients opinion while doing shade selection?</td>
<td>A. Yes B. No</td>
</tr>
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<td>11</td>
<td>Which method do you prefer during shade selection.</td>
<td>A. Visual (manual) B. Instrumental (mechanical) C. Combination of both</td>
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<td>If manual, under what type of light would you do shade selection</td>
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<td>What method of isolation do you prefer while doing shade matching for anterior restoration?</td>
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<td>While matching the shade of a tooth, it is done as</td>
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<td>What is the most common shade you use in your practice?</td>
<td>A. A1 B. A2 C. B1 D. B2 E. Combinations of color if so (what are the colors you use?)</td>
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</table>
5. What is the ideal time required for shade selection?

   A. 3.7 s
   B. 7.7 s
   C. 14 s
   D. 3.1 s

6. Do you think shade selection at the beginning of an appointment is better than doing it later?

   A. 55.6 s
   B. 14 s
   C. 14 s
   D. 3.1 s

7. Do you think age, sex, and gender of the patient's play an important role in shade selection?

   A. 55.6 s
   B. 14 s
   C. 14 s
   D. 3.1 s

8. Who according to you is more concerned about esthetics?

   A. 5.4 s
   B. 70.9 s
   C. 77.1 s
   D. 14 s

9. In your opinion, what is the most common complaint patients have regarding anterior tooth restoration?

   A. 60 s
   B. 32 s
   C. 5 s
   D. 17 s

10. Do you take patients opinion while doing shade selection?

    A. 50.7 s
    B. 19 s
    C. 5 s
    D. 17 s

11. Which method do you prefer during shade selection?

    A. 59.6 s
    B. 16 s
    C. 67 s
    D. 14 s

12. If manual, under what type of light would you do shade selection?

    A. 36 s
    B. 1 s
    C. 61 s
    D. 7 s

13. Which method of isolation do you prefer while doing shade matching for anterior restoration?

    A. 22.5 s
    B. 16 s
    C. 5 s
    D. 17 s

14. While matching the shade of a tooth, it is done as.

    A. 24 s
    B. 9 s
    C. 67 s
    D. 14 s

15. What is the most common shade you use in your practice?

    A. 2.2 s
    B. 64 s
    C. 15 s
    D. 6 s
    E. 5.25 s

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.[10,21] 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.

**References**


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