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Knowledge Attitude and Perceptions Regarding Shade Selection of Anterior Teeth among the Dental Professionals of Ghaziabad: A Kap Study

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Abstract –

Background & Aim – Aesthetics has become a major concern in the current era in treatment planning. Reproducing the color of a natural tooth with artificial replacement still possesses a great challenge in modern dentistry.The present cross- sectional study was done to evaluate the knowledge, attitude and practices regarding shade selection of anterior teeth amongst the dental practitioners, post graduates & interns of Ghaziabad.

Methodology – A cross sectional study was conducted amongst a randomly selected sample of 390 dentists of Ghaziabad city. A validated, structured, self-administered questionnaire comprising of 20 closed ended questions was distributed to assess KAP regarding shade selection. Descriptive analysis & Pearson's Chi square test was applied keeping level of significance p<0.05.

Results – The study showed high significance to the highest qualification. There was no association with gender.

Conclusion – In the 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.

Keywords – Shade Selection, Aesthetic, Restoration, Dentists, Cosmetic Dentistry

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INTRODUCTION

Aesthetics has become a major concern of current era in treatment planning. Artificial replacement of the colour of a natural tooth is still a great challenge in modern dentistry.[1-4] To achieve an esthetic dental restoration a successful color matching clinically is one of the most important factors. Evaluation of tooth color in restorative procedures are commonly done with the aid of dental shade guides. However, various reports have shown that sufficient spectral coverage of the natural tooth colors are not obtained with the use of common shade guides. To address issues associated with the shade guide, distinct avenues have been pursued for objective spectrophotometric / colorimetric assessment.[5] There are two techniques by which color choice in esthetic restorations could be done. The first is the visual matching of shade which draws a comparison between shade guide and teeth in dentist's own eye and the second one is using a more recently introduced digital shade analysis system. Although the visual shade selection has a lot of drawbacks, decision of color by this visual shade matching and the ways of expression for the decided color are

still applicable to clinical dentistry.[6] The understanding behind the theory of color dimension is of utmost significance in order to achieve greater esthetics and better shade matching.[7] The present cross sectional study was done to evaluate the knowledge regarding shade selection of anterior teeth amongst the dental practitioners, post graduates & interns of Ghaziabad as no similar studies have been conducted in Ghaziabad, Uttar Pradesh.

METHODOLOGY

A cross-sectional questionnaire study was done amongst the dental practitioners, post graduates and interns of Ghaziabad to study the knowledge, attitude and practice regarding shade selection of anterior teeth.

Sample size was calculated based on census method. Estimating a population of 3000, 95% confidence interval with marginal error of 5%, the sample came to 390. Those willing to participate in the study while those who refused to answer were excluded. A verbal consent was obtained from the participating population.

A pre- validated questionnaire was taken which was modified based on the result of pilot study & later checked for its validity & reliability. A 20 closed ended, variable, structured, self – administered questionnaire in English was distributed by the investigator & collected back the next day.

Ghaziabad city was divided into 5 zones- North, East, West and South. Samples were randomly selected from each zone by method of double random sampling.

The data collected were entered & compiled using MS-Office Excel. Statistical analysis was done using SPSS version20. Frequency, percentage was calculated. Cronbach's alpha was found to be 0.83. Chi Square test was applied. Statistical significance was kept at p value<0.05.

RESULT

It was observed that amongst 390 dental practitioners 136 (34.9%) were males and 254 (65.1%) were females. Most of the population lied between the age group 25-35 years as (table 1). The overall demographic details of participants are shown in table 1. The study participants comprised mostly of Interns. The category wise distribution of all participants according to department is shown in figure 1, Table2.

Table1: Sociodemographic data

Age	Frequency	Percentage
25-35	330	84.6%
35-45	44	11.3%
45-55	16	4.1%

Gender	Frequency	Percentage
Male	136	34.9%
Female	254	65.1%

Education	Frequency	Percentage
Post graduate student	140	35.9%
M.D.S	62	15.9%
B.D.S	188	48.2%

Table 2: Department wise distribution of participants

Department	Frequency	Percentage
Interns/ NA	178	45.6%
Endodontics	48	12.3%
Oral surgery	24	6.2%
Oral medicine	24	6.2%
Prosthodontics	28	7.2%
Orthodontics	36	9.2%
Pedodontics	8	2.1%
Periodontics	24	6.2%
Public health dentistry	8	2.1%
Oral pathology	12	3.1%
Total	390	100%

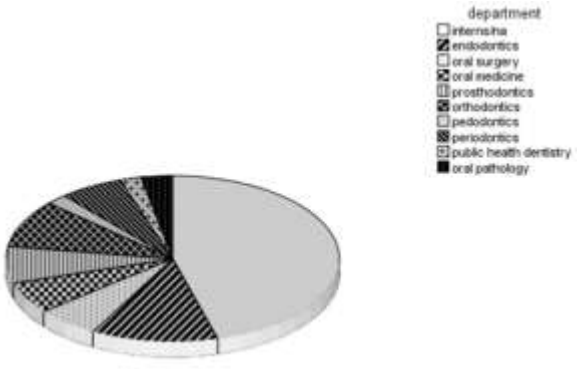

Figure1: Pie chart showing department wise distribution

Knowledge showed high level of significance with education and also with department of Conservative Dentistry & Endodontics. There was no association with gender.

Less significance was observed with attitude to level of education, age, years of practice or gender.

The level of significance is depicted in the table 3 where high level of significance was seen with the level of qualification. The time of shade selection

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showed association to all, gender age & highest qualification & so did taking opinion of the patient.

Table 3 p value

Questions	Gender (p value)	Age (p value)	Highest qualification (p value)
Which of the following in your opinion is important during shade matching?	0.01	0.01	0.04
Which of the following do you think plays a vital role in shade selection?	0.01	0.01	0.01
Which variable affects the perception of color, the most:	0.09	0.01	0.01
According to you which is the best time for shade selection	0.01	0.02	0.00
What is the ideal time required for shade selection?	0.05	0.23	0.02
Do you think shade selection prior to the treatment procedure is better than doing it later?	0.00	0.21	0.00
Part of tooth would you prefer for the shade selection	0.03	0.02	0.01
Distance you keep between the patient's teeth and observer's eye during shade selection	0.01	0.01	0.06
Which of the following shade guide do you use?	0.06	0.01	0.01
Do you use any of the following shade taking devices?	0.01	0.57	0.02
Do you use squint test for shade selection?	0.05	0.32	0.01
How many times do you check the shade before deciding the final shade?	0.01	0.01	0.02
Which sequence do you use for shade matching?	0.01	0.54	0.01
Which lighting condition do you use for shade recording?	0.01	0.01	0.04
Do you and your technician work together for shade selection?	0.05	0.01	0.01
How do you transfer the shade to the lab technician?	0.69	0.04	0.01
Do you use Stump shade guide to record the preparation shade for all-ceramic restorations?	0.12	0.03	0.04
Do you give importance in selecting the shade of the resin luting cement in case of all ceramic restorations?	0.01	0.01	0.13
Placement of the shade tab while performing shade matching	0.01	0.03	0.01
Do you take the patient's opinion while doing shade selection?	0.04	0.01	0.01

Chi square applied; p<0.05

The result showed 4.1% (16) believed hue and chroma, 10.8% (42) in value, 7.2% (28) & 73.8% (288) believed all the factors to be responsible play a major role in shade selection.

For the perception of colour 34.4% (134) said light source to be responsible while 1% (4) were of support of environment, 8.2% (32) Tooth including textures and layers 3.1% (12) said it depends on the eye of the receiver and 53.3% (208) said that all factors were responsible. 32.8% (128) did not follow any particular shade selection pattern, whereas 31.8% (124) were of support that light from North to be effective for shade selection, 27.2% (106) believed morning to be the most suitable time for shade selection. 39.5% (154) of dentist were in favour of shade selection to be done within 5 seconds, while 35.9% (140) were for 5-10 seconds, 18.5% (72) were for 10-15 seconds and only 6.2% (24) for 15-20 seconds. 82.6% (322) does shade selection at the beginning of appointment while 17.8(62) does it during later part of the appointment. 9.2% (36) of the dental practitioners prefer cervical 3rd for shade selection, 13.8% (54) incisal 3rd, 9.2% (36) middle 3rd & 67.7% (264) all tooth surface for shade selection.

When asked about the appropriate distance between patient tooth & observer eye 52.3% (204) were in support of distance being 1-2 feet, 31.3% (122) less than a feet, 10.3% (40) 30f 3 feet & 6.2 (24) for more than 3feet. 47.7% (186) uses Vitapan 3D Master shade guide, 33.8% (132) Vita Classical shade guide, 15.4% (60) VITA Linear Guide 3D and only 3.1%(12) Chromascop Shade guide. 58.5% of participants do not use any device for shade selection, while 23% (90) uses Digital Camera or RBG, 11.3%(44) uses Spectrophotometry and only 7.2% (28) uses Colorimeter. 60% (234) uses squint test for shade selection & 40% (156) do not use squint test. 53.3% (208) of dentists check twice before final shade selection, 25.6% (100) more than twice and 21% just once. Regarding the use of light condition during shade selection, most of them 46.2% (280) uses bright sunlight, 26.7% (104) uses multiple source of light, 10.3% (40) uses LED Light & Chair side light & 5.1% (10) uses halogen light. 47.7% (186) work with the technician during shade selection while 52.3% (204) didn't. 47.7% (186) used shade chart to transfer shade to the technician, 35.9% (140) with the help of paper sketch of a tooth divided in 3 parts, 10.3% (40) through digital photographs, 6.2% (24) by spectrophotometer and Chromascop. 56.4% (220) uses stump shade guide whereas 430 (176) do not. 76.4% (298) gave importance in selecting the shade of the resin luting cement in the case of all-ceramic restorations in contrast to 23.6% (92) who doesn't. 74.4% (298) placed shade tab adjacent to the tooth to be matched and 25.6% placed above or below the tooth to be matched. 89.7% (350) took into consideration patients' opinion as well during shade selection & 10.3% (40) didn't.

DISCUSSION

The present cross-sectional study focused on evaluating the knowledge, attitude and practices regarding the shade selection of anterior teeth & to increase the knowledge regarding the same.

Color should be understood as the outcome of the inter-relationship of three parameters i.e., hue, chroma and value.[8,9] Hue distinguishes between different families of color (red, blue, and green). Value depicts the lightness or darkness of a particular color.[10] Chroma is understood as the saturation degree of the hue, such as light blue, dark blue, royal blue, and is represented in dentistry by numbers, whose order is crescent in saturation. The hue remains the same, although the greater thickness of the enamel interferes in its perception, giving it a less saturated aspect.[11] Therefore, the hue of the tooth is given by the dentin and influenced by the enamel. The enamel does not change the hue, but only confers a greater or lesser saturation or chroma according to its thickness.[12,13]

In our study most of the participants considered appointment timing to be as important as other factors which was in accordance with the study done by Sambandam et. al.[14]

In the study about the essentials for shade selection majority of our participants believed that Knowledge, Skill, Talent Individual Observer was essential for shade selection which was in contrast to study done by Mazen N. et. al.[15] where most of the participants believed skill to be essential, while in a similar study done by Dagh H.O et.

al.[16] where the participants were in support of individual observer to be essential.

Color selection should be done on clean teeth and with the natural humidity of the oral cavity. That is necessary because water plays a fundamental role in the final color outcome.[17]

A common mistake in color selection step is to use ceramic shade guides. These are not indicated because their use is specific for prosthetic pieces and they are fabricated from materials that differ completely from composite resins.[11]

The response for ideal time of shade selection was again in contrast to study done by Mazan et. al.[15] in which only 19.5% of dentist were in accordance with time of less than 5 seconds, where as it was similar to a study done by Sambandam et. al.[14]

Vitapan Classical system which is based on hue is one of the most frequently used shade guide systems used in Iran.[16] Taking the drawbacks of the VITA Classic shade guide into consideration, recently a more effective shade guide of higher efficacy called the Vitapan 3D Master, has been introduced, as it is simple to use.[18] Therefore, it is easier to perform shade selection along with more precision in a more systematic manner.[19,20,21]

In a study by Paul et. al.[22] comparison of shade selection using spectrophotometric and visual techniques with Vitapan Classical shade guide was done. In conclusion it was stated that Vitapan Classical shade guide could not exhibit the entire range of the colour when compared to the natural teeth. This conclusion was in harmony with the outcomes of a study by Wee et. al.[23]. In the current study most of the participants had knowledge regarding 3D Vitapan Master Guide.

In a study done by Rajakreeti et. al.[24] 60% of the dentist preferred LED light. The monitoring is less required in LED units, since it is able to keep the irradiance stable for long time[24] which was opposite to result of our study where only 10.3% were in support of LED light.

Colour or shade which is of paramount importance should not be ignored as there is an increasing awareness and demand for aesthetics by the patient.

CONCLUSION

Proper shade selection in the field of esthetic dentistry is of utmost importance and hence it cannot be ignored. Until and unless the closest shade selection is done, the final outcome of the restoration will not be satisfactory. With the upcoming advancements in cosmetic and esthetic dentistry, proper training and skill enhancement is recommended. Under graduates should be trained as well and other branches of dentistry should be taught shade matching for clinical practice. Dentists should keep themselves in touch with recent development and learn new techniques for shade selection.

LIMITATATION

The limitation of the study are response bias and social desirability bias as all the participants of the study are dental practitioners and the evaluating body also consists of dental practitioners. Since the study sample was not too large hence the study cannot be generalized.

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FINDING

Nil

CONFLICT OF INTEREST

None

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