

DOES AGE DETERMINES THE LIGHTNESS AND DARKNESS OF TOOTH SHADES?

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ABSTRACT:

AIM- To analyse whether age determines the lightness and darkness of tooth shades.

INTRODUCTION- With increase in demand for esthetics in developing countries like the Indian, the importance provided to match the tooth shade creates a great difference in the satisfactory outcome of the patient in the field of dentistry. Hence in this study, the differences in tooth shade values according to age, was investigated among a sample of the Indian population.

MATERIALS AND METHODS- 238 individual's case sheets with the age range of 18 to 65 years. 18-30 years of age were considered as group 1 (young adults), 31-45 years in group 2 (middle age) and above 45 years in group 3 (older age). The shade of the middle third of the labial surface of the permanent maxillary left or right central incisor was recorded using the Vitapan 3D-Master shade guide. The collected data was imported to Statistical Packages of Social Sciences, version 17 (IBM Corporation). Chi square test was used to determine the significance between the groups.

RESULTS: From the data, 17.2% showed A1 shade, 35.2% A2 shade, 7.5% A3 shade, 5% A4 shade, 7.1% B1 shade, 15.9% B2 shade, 7.1% B3 shade, 3.3% B4 shade and 1.1% C1 shade. The individuals under the category of above 45 years showed darker tooth shade compared to young adults and middle age groups (Chi square test; $p < 0.001$).

CONCLUSION: The significant association was established with darker tooth shades by increasing age and vice versa. The elder population showed a very strong positive correlation for dark shade between teeth. The aging process significantly affects the teeth color. Hence as a dentist, it is important to know about the distribution of tooth shade and its association with age to get an outcome with adequate patient satisfaction.

KEYWORDS: Age factor; Tooth shade; Lightness; Darkness of shade.

INTRODUCTION:

A smile is the most visible record of a dentist's care. The significance of tooth shade in one's perception of smile attractiveness cannot be underestimated. In today's beauty conscious society, the demand for esthetic dentistry has increased a lot in the last few years. Tooth colour

is an important factor to satisfy the patient's demands in terms of esthetics. Multiple factors like gender, skin tone and age determine the selection of light and dark tooth shades(1). Many studies proved the significant association between age and tooth shade values. Research in the field of esthetics and shade matching has been predominantly in the western population. This relation has been collaborated by many studies which have shown darker tooth shade values with an increase in age and vice versa. Earlier studies proved that increasing age showed darkening of tooth shades which can be due to prolonged tooth wear, dietary consumption, intrinsic factors such as congenital defects of enamel or dentin such as amelogenesis and dentinogenesis imperfecta, environmental factors such as tetracycline staining, traumatic injury and dental caries and extrinsic staining such as smoking, xerostomia and restorations(2). Younger adults attributed to less tooth shade value due to reduced exposure of teeth to the oral environment(3). One of the reasons for varying results can be attributed to the ethnic origin of the study samples. In Spite of the factors correlated with tooth shade, the selection of artificial tooth shade to replace the edentulous area is a relatively simple procedure but the angle at which the tooth colour is viewed is important to yield a satisfactory outcome(4).

Our team has extensive knowledge and research experience that has translated into high quality publications (5–22). However, with increasing demand for esthetics in developing countries like the Indian subcontinent, research in the field of esthetics based on a local population has become the need of the hour. In this study, the differences in tooth shade values according to age, was investigated among a sample of the Indian population.

MATERIALS AND METHODS:

The study consists of 238 individual's casesheets with the age range of 18 to 65 years. Datas were collected from patients databases using DIAS. The datas were further divided into 3 groups based on age. Age groups of 18-30 were considered as group 1 (young adults), 31-45 years in group 2 (middle age) and above 45 years in group 3 (older age). Permanent maxillary central incisors with carious lesions, restorations, endodontically treated teeth, intrinsic staining, extrinsic staining due to diet, smoking and tobacco/pan chewing, tooth wear or any tooth abnormality, xerostomia and history of tooth bleaching or radiation therapy were excluded from the study. The shade of the middle third of the labial surface of the permanent maxillary left or right central incisor was recorded using the Vitapan classical shade guide. The collected data was tabulated in excel sheet and imported to Statistical Packages of Social Sciences, version 17 (IBM Corporation). The analysis was made using descriptive statistics.

RESULTS:

The results of the study are presented as bar diagrams below. **Table 1** showed the percentage of males and females involved in this study is 64.5% and 35.3% respectively. From **Figure 1**, 16.74% showed A1 shade, 35.2% A2 shade, 7.5% A3 shade, 5% A4 shade, 7.1% B1 shade, 15.9% B2 shade, 7.1% B3 shade, 3.3% B4 shade and 1.2% C1 shade. From **Figure 2**, individuals under the category of above 45 years (Group 3) showed darker tooth shade

compared to young adults (Group 1) and middle age groups (Group 2) [Chi square test; $p < 0.001$].

DISCUSSION:

The interrelationship of age to tooth shade is crucial to provide a successful esthetic rehabilitation. Hence this study tries to establish a relationship between age and tooth color based on each and every individual. Tooth color is found to be one of the important factors in esthetics. For tooth shade determination, the middle third portion of the tooth is the necessary site as it is the best representative of color gradation, incisal edge is predominantly translucent while cervical edge was modified by scattered light by gingiva(23).

In this study, the tendency of darker tooth shade was associated with increasing age. This can be attributed to secondary dentin formation approximately after 35 years along with thinning of enamel due to tooth wear. As the age advances, the pulp chamber which is large during young age becomes smaller as a result of deposition of secondary dentin, making the tooth more opaque(24). However, few people with younger age showed inherent darker and yellowish shade that must be considered. Hasegawa et al. reported that the natural tooth color showed a significant decrease in lightness at the center to cervical site and increase in yellowness with advancing age (25). Similar correlation was reported by Jahangiri et al., where a significant association was found between tooth color and age of the patients, in that with advancing age, teeth tended to become darker in color (26). In a similar study conducted by Esan et al., it was found that the percentage of lighter tooth shades decreased with age, and that of darker ones increased with age within an age group (27). Hassan et al. found that the patients exhibiting gray and red-gray colors increased with increasing age (28). The findings of this study are in coherence with the results of the above-mentioned studies.

Within the limits of the study, the significant association was determined between age and tooth shade. However, other factors like gender and skin complexion should also be associated with tooth shade to provide a more lifelike prosthesis for replacement of anterior and posterior teeth.

CONCLUSION:

The significant association was established with darker tooth shades by increasing age and vice versa. The elder population showed a very strong positive correlation for dark shade between teeth. The aging process significantly affects the teeth color. Hence as a dentist, it is important to know about the distribution of tooth shade and its association with age to get an outcome with adequate patient satisfaction.

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CONFLICT OF INTEREST- Nil

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GENDER	MALE	FEMALE
FREQUENCY	154	84
PERCENTAGE	64.5	35.3

Table 1- Table showing the distribution of gender involved in this study.

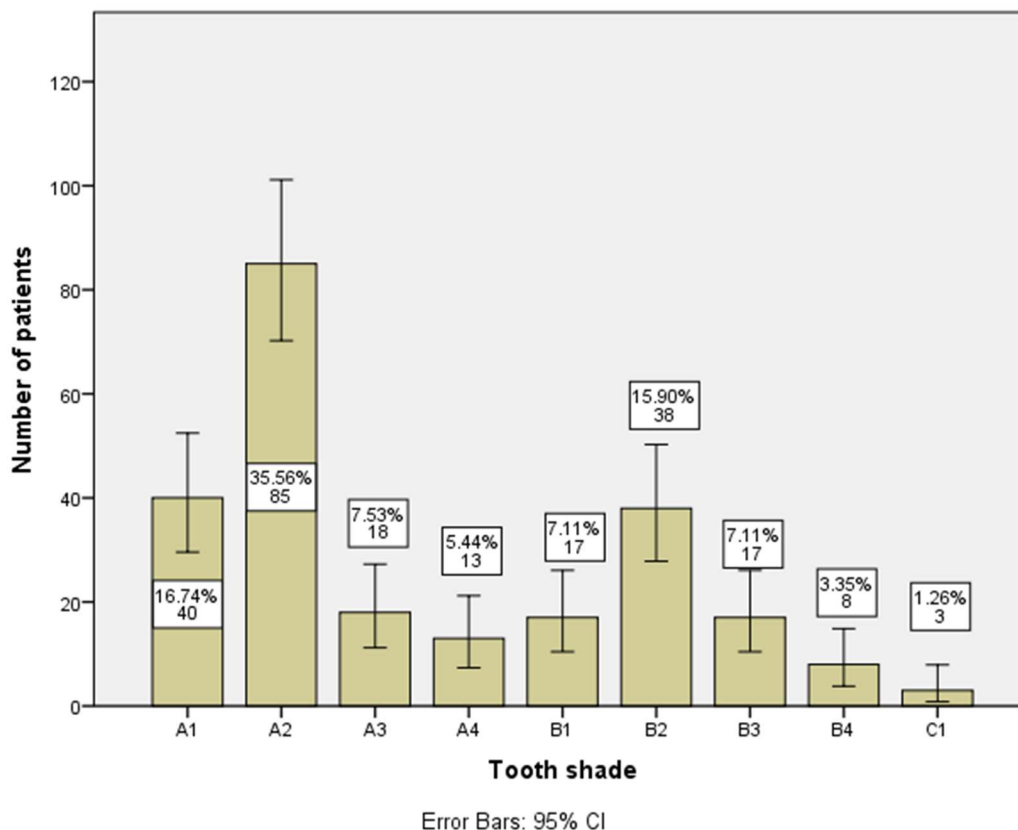


Figure 1- Graph shows the distribution of tooth shade among participants. 16.74% showed A1 shade, 35.2% A2 shade, 7.5% A3 shade, 5% A4 shade, 7.1% B1 shade, 15.9% B2 shade, 7.1% B3 shade, 3.3% B4 shade and 1.2% C1 shade. X axis indicates the tooth shades of the study population and Y axis indicates the percentage of the study population.

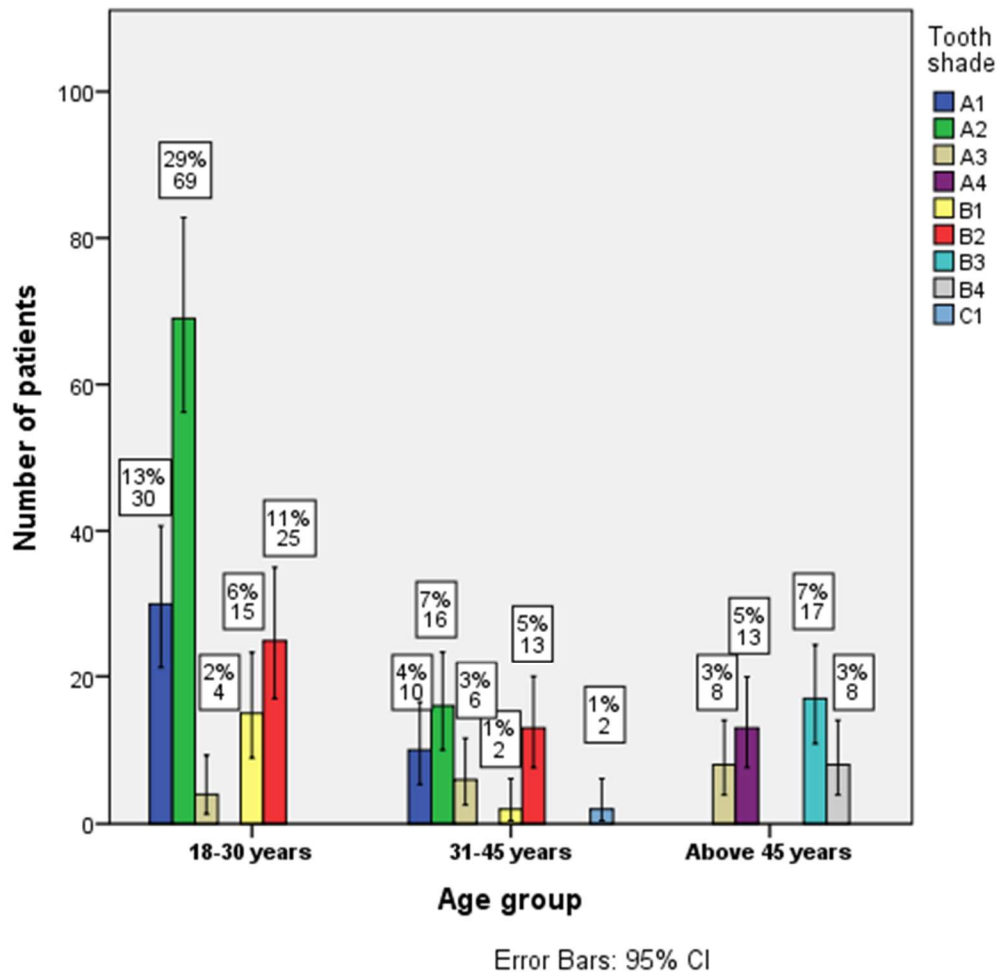


Figure 2- Graph shows the association of age and tooth shade among participants. X axis indicates the age of the study population and Y axis indicates the percentage of the study population. The individuals under the category of above 45 years (Group 3) showed darker tooth shade compared to young adults (Group 1) and middle age groups (Group 2) [Chi square test; $p < 0.001$].