

# Awareness of Digital shade matching principles among dental practitioners

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Kiran. K

Undergraduate student,

Saveetha Dental College,

Saveetha University,

Chennai,

India.

Corresponding Author:

Dr. Vinay sivaswamy

Assistant professor,

Department of Prosthodontics,

Saveetha Dental College,

Saveetha University,

Chennai,

India

Email: kirankannan456@gmail.com

Phone no. : 8089857654

Author name: Kiran. K

Guide name: Dr. Vinay Sivaswamy

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## **Introduction**

### **Aesthetics:**

The demand for aesthetic has carried over to the field of dentistry since a 'perfect smile' is one of the primary constituents of an aesthetic appearance. There is a rising awareness among patients on the need for an aesthetic appearance and the aesthetic options available in dentistry the biggest challenge for dental clinicians is to provide an aesthetic outcome in every treatment they perform. A dentist is most often requested to provide a replacement for a missing tooth or change the appearance of an existing tooth by introducing a crown or a bridge. Functional replacement alone is not sufficient in these cases and the restoration or prostheses would be successful only if there is optimal aesthetics. An aesthetic restoration would match the appearance of natural teeth in shape and form, texture and shade. Shade matching in dentistry, in particular, is a highly debated topic for which numerous methods have been described for shade matching in a controlled environment. Till date however, there are no standard guidelines which would provide predictable and consistent results without the use of highly expensive equipment.

### **Shade Matching in Dentistry:**

Shade matching involves three steps, namely, clinical determination of the tooth shade, communication with the laboratory and the reproduction of the determined shade in the dental porcelain. Clinical determination of tooth shade can be broadly categorized into visual and Instrumental

**Visual methods** involve shade determination by comparison of the patient's tooth shade with a set standard shade guides. This method has not been consistent due to a number of variables shades involved in this process. Visual acuity, primarily color perception is variable among individuals and it has also been proven that females have better color perception compared to males. There are also other variables which can affect shade matching such as external light, age, experience, sex, etc. Any kind of miscommunication would result in a mismatched shade in the restoration, which results in the restoration being corrected in the laboratory far too often with an inevitable increase in laboratory cost.

**Instrumental methods** were developed to overcome the limitations inherent in the visual method. Digital photography makes it possible to evaluate the tooth as a whole unit instead of mere shade determination the tooth shape, texture, effects such as hypoplasia/decalcification, translucency and the color gradation of natural teeth can be effectively captured using photography. This method also enables effective communication with the laboratory technician due to the ease of transmitting digital information through the internet. Digital images of shade tabs positioned near teeth minimize the discrepancy in colour communication between the clinician and technician. However, there are no standard guidelines established for digital

photography to enable its use as a standard shade matching aide. Uneven illumination due to variable shooting modes and the difference in proprietary algorithms found in each brand of digital cameras make this method highly inconsistent. Technological advances in camera sensors have made it possible for users to capture the most minuscule of details in a high resolution format. The colour gradation seen in individual natural teeth can be captured and reproduced provided the imaging is standardized across all platforms commercially available.

This study aims to determine the accuracy of shade matching by digital photography assisted by software evaluation with digital cameras. This would aid in establishing the accuracy of the imaging algorithms using digital camera, this aids in establishing a guideline for shade matching via digital photography for dental clinicians.

**AIM:**

The aim of the study was to check the awareness about digital shade matching principals among dental practitioners

**Materials and methods:**

A survey of 13 questions was prepared and was circulated among 100 dental practitioners in Chennai. The responses were obtained to get the results.

**Results and discussion:**

71% of the dentist accepts that it is possible to use photographs to match shades of teeth. Since it is the best instrumentsl method of shade matching it is one of the best options in digital shade matching.

In order to prevent the change in colour tone while taking a photograph it is always advisable to use grey contraster,51% of them are aware of this fact. Ideal lighting to get a perfect picture in shade matching in dental operations is obtained by using White LED with colour correction filters. 41% of the practitioners are aware of this.

Temperature plays a major role in photography of the teeth, since temperature change can effect the quality of the photography. Optimum temperature set for a perfect photography is 7000k we have got 37% positive response.

CRI should be greater than 90. 47% of them are aware of this. 51% of them say that custom white balance with grey contraster is to be used to get a neutral colour tone.

From the above observations we come to a conclusion that there is appreciable awareness about Digital shade matching principles among dental practitioners in Chennai.

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