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Association Between Age and Gender of Patients Underwent Tooth Whitening procedure

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Abstract: Tooth whitening has become one of the most frequently requested dental procedures by the public and the public has come to demand more whiter teeth, and a perfect smile. These include home-based products such as toothpastes, gels, and in-office based highly concentrated bleaching agents are applied under professional supervision. The profession and public have been aware of certain risks related to tooth whitening such as increased tooth sensitivity and gingival irritation. New research has shown that there are other risks such as tooth surface roughening, increased potential for demineralization, degradation of dental restorations, and unacceptable color change of dental restorations. The research is also focused on optimizing whitening procedures to reduce tooth sensitivity and to increase the persistence of the whitening. The aim of the study is to find the association between age and gender of patients undergoing tooth whitening. A total of 89000 cases were reviewed between June 2019 to March 2020 for teeth whitening procedure. A sample size of 30 case sheets were reviewed and data was analysed using SPSS software. The results were represented in the form of graphs. Chi Square was done to find the association between age and gender of patients who had undergone tooth whitening procedure and association was found to be statistically not significant ($p>0.05$). However there the association between the age and gender of the patient and type of bleaching procedure was found to be statistically significant ($p<0.05$). There are various treatment modalities available for tooth whitening. Dentists should educate patients about the benefits and risks of different whitening methods based on the current research and to suggest the best treatment option based on a correct diagnosis.

Keywords: Age; Gender; Innovation; Smile; Tooth whitening

INTRODUCTION

Dental appearance is a vital feature in determining the attractiveness of a face and thus, it plays a key role in human social interactions. Among the significant factors affecting overall dental appearance are tooth colour , shape and position , quality of restoration and the general arrangement of the dentition , especially the anterior teeth.(Qualtrough and Burke, 1994)

An aesthetically pleasing smile depends on tooth color , size , shape and position, upper lip position , amount of gingival display and visibility of teeth (Van der Geld, Oosterveld and Van Heck, 2007) . Although each factor may be considered individually, all the components must act together to create a harmonic and symmetric entity that produces the final aesthetic smile. (Samorodnitzky-Naveh, Geiger and Levin, 2007) Furthermore , treatments improving dental aesthetics have been found to increase patient quality of lids and psychological status.(John et al., 2004).

The process of teeth whitening is scientifically known as bleaching. It normally involves a chemical process of oxidation that occurs within the enamel to make it look lighter than before . Several bleaching materials, techniques and products have been introduced over the years and there are two major types of dental bleaching, the office bleaching and home bleaching. A study has shown that one of the most challenging tasks related to rising demands in esthetic dentistry is to achieve a restoration that matches the color and appearance of a natural tooth (Carey, 2014) .

There are several studies which show an incline pattern towards the female gender when acquiring dental bleaching treatments in genders.(Joshi, 2016). Similar findings were proved by Grzine et al., where patients face embarrassment during smile and female genders were significantly higher in choosing dental bleaching as a

treatment option to satisfy their satisfaction. A study also revealed that many dental patients had already undergone teeth whitening procedures, which shows a high desire to improve proper dental esthetics (Carey, 2014) .

Previously our team had conducted numerous studies which include in vitro studies, review ,survey, clinical trial. (Ramanathan and Solete, 2015; Kumar and Delphine Priscilla Antony, 2018; Manohar and Sharma, 2018; Ravinthar and Jayalakshmi, 2018; Teja, Ramesh and Priya, 2018; Rajakeerthi and Ms, 2019; Rajendran et al., 2019; Siddique et al., 2019; Janani, Palanivelu and Sandhya, 2020); (Nandakumar and Nasim, 2018); (Noor and Others, 2016) (Ramamoorthi, Nivedhitha and Divyanand, 2015); (Teja and Ramesh, 2019) ; (Jose, P. and Subbaiyan, 2020), ((Nasim et al., 2018).

Our department is passionate about research we have published numerous high quality articles in this domain over the past years ((Kavitha et al., 2014) , (Praveen et al., 2001),(Devi and Gnanavel, 2014), (Putchala et al., 2013), (Vijayakumar et al., 2010), (Lekha et al., 2014a, 2014b) (Danda, 2010) (Danda, 2010) (Parthasarathy et al., 2016) (Gopalakannan, Senthilvelan and Ranganathan, 2012), (Rajendran et al., 2019), (Govindaraju, Neelakantan and Gutmann, 2017), (P. Neelakantan et al., 2015), (PradeepKumar et al., 2016), (Sajan et al., 2011), (Lekha et al., 2014a), (Neelakantan, Grotra and Sharma, 2013), (Patil et al., 2017), (Jeevanandan and Govindaraju, 2018), (Abdul Wahab et al., 2017), (Eapen, Baig and Avinash, 2017), (Menon et al., 2018), (Wahab et al., 2018), (Vishnu Prasad et al., 2018), (Uthrakumar et al., 2010), (Ashok, Ajith and Sivanesan, 2017), (Prasanna Neelakantan et al., 2015). Now we are focusing on retrospective studies, the aim of the study is to assess the association of age and gender of patients who had undergone tooth whitening procedures.

MATERIALS AND METHODS

Study Setting

This retrospective study was conducted under a hospital based university setting

Ethical Approval

Ethical permission and approval for the project was obtained from the Institutional Review Board of Saveetha Institute of Medical and Technical Sciences, Chennai, India on Date 25/04/2020**.**

Inclusion criteria

The patients who had undergone treatment for tooth whitening (Vital bleaching and Nonvital bleaching)

Exclusion criteria

Treatment procedures apart from tooth whitening were excluded

Data Collection

Patients reported from June 2019 to March 2020 were reviewed. 82000 patient records were reviewed and data related to tooth whitening were extracted . Data includes age, gender and type of tooth whitening. The collected data was tabulated in the excel sheet. Statistical analysis was done using SPSS software (version 9.0.3).

Statistical Analysis

The descriptive statistics were used to determine the frequencies and percentage of the gender and age of the patients underwent tooth whitening procedures. Chi square test, was used to assess the association between age and gender of the patients undergoing tooth whitening procedures. The outcome data was represented in the form of a bar graph.

RESULTS AND DISCUSSION

A total of 30 patients who had undergone tooth whitening treatment. Out of 30 patients , 26 of them are males and 4 of them are females. In this study male patients contribute 86.7% and females contribute 13.3% [Figure 1]. Majority of the patients were male.

Patients who are aged between 21-30 years have undergone more tooth whitening procedures when compared to any other age groups. Here, 60% of patients were 21-30 years followed by 16.67% (10-20 years) and the least was 3.33% (50-70 years) [Figure 2].

Tooth whitening procedures are Vital and Non vital bleaching. 63.33% of patients underwent Vital bleaching whereas, 36.67% of them underwent non-vital bleaching [Figure 3].

There is significant association between age and gender of the patient and type of bleaching procedure done. Majority of the procedures undertaken were vital bleaching at the age between 21 to 30 years. Maximun number of vital and Non vital bleaching was done among male patients when compared to female patients [Figure 4,5].

There is no association between age and gender of the patients undergoing tooth whitening procedures [Figure 6]. Statistical analysis, Chi-Square test $p=0.401$, where $p>0.05$ indicating non significant

Shade matching is a complex phenomenon, as it holds both subjective and objective characteristics. Accurate identification of shade for tooth whitening is an essential aspect in the accomplishment of a successful dental treatment and the selection of the teeth with a " near to perfect" shade has shown to influence a patient's esthetic perception more positively and it also improves treatment prognosis. Among other vital factors such as facial complexion and skin colour plays an important role in shade matching. However, there is limited verification to implicate the patient's skin colour,as a factor influencing the shade perceptions. Failures to associate these factors limits the ability of a dental clinician to select the proper artificial teeth shade to complement the facial complexion of the patient.(Vadavadagi et al., 2016)

Whiter teeth have been positively correlated with high ratings of social competence and intellectual ability.(Kershaw, Newton and Williams, 2008) In a study, it was observed that lighter teeth shades were preferred and were considered to be more esthetically appealing with fair skin colour.(Labban et al., 2017). The brightness of the tooth perceived by the observer can change depending upon the background brightness. According to a study , Sabherwal et al.,(2009) conducted a study to determine whether variations in skin colour would influence perceptions of smile attractiveness for a given tooth shade value.They have reported that variation in skin colour for most teeth shade values influenced the perceived smile attractiveness.

In this study, we have found that vital bleaching was the most common procedure. Bleaching, as a sound promising , may not guarantee 100% success in all cases or may fail to satisfy a patient's high expectations. Patients' lifestyle , current levels of tooth sensitivity , the type of discoloration , baseline shade of the teeth and time available for bleaching are important factors to be contemplated while selecting the bleaching techniques. Bleaching is contraindicated in pregnant women as the effects of bleaching materials on the fetus are yet to be investigated.(Labban et al., 2017)

Based on Figure 1 , most patients in this study are aged 25 years .Younger individuals have more concern on the appearance of teeth when compared to other age groups. The tobacco stains and other brown stains respond to longer bleaching regiments , as they are not easy to bleach.(Centers for Disease Control and Prevention (US), National Center for Chronic Disease Prevention and Health Promotion (US) and Office on Smoking and Health (US), 2010). (Alkhatib, Holt and Bedi, 2005)

Further, an analysis of the clinical results with over 600 subjects undergoing tooth bleaching, indicate that the more yellow the teeth at baseline, the greater the magnitude of the whitening response. This analysis demonstrated a significant relationship between subject age and the magnitude of whitening response, with younger subjects experiencing greater tooth whitening. Further, there was a relationship between subject age and the initial colour and the magnitude of whitening response. Older subjects with less yellow initial tooth colour exhibited the smallest mean colour change post bleaching, whereas younger subjects with more yellow initial tooth colour exhibited the greatest mean colour change post bleaching. In addition, neither gender nor coffee/tea consumption had any significant effect on the tooth whitening response.(Gerlach and Zhou, 2001)

Several clinical studies have evaluated the use of supplementary light on the effectiveness of vital bleaching procedure in in-office technique.(Mounika et al., 2018)The light source heats the Hydrogen Peroxide, thereby increasing the rate of decomposition of oxygen to form oxygen-free radicals and thus enhances the bleaching effect. In a study by Baroudi et al,it was stated that light sources used during power bleaching procedure do not generate sufficient heat to damage teeth. They included that high concentrations of chemicals are responsible for faster whitening and that light sources are , therefore , superfluous in the whitening process.(Baroudi and Hassan, 2014)

Present study has a limitation of small sample size with only 30 patients. It is a unicentric study and only one specific ethnic was witnessed in the study sample. In furthers scope, similar study with larger sample size and multi centered study has to be conducted in order to attain appropriate results.

CONCLUSION

Within the limitations of the study, it was concluded that there is no association between age and gender of the patients who had undergone teeth whitening procedure. However, males preferred more tooth whitening procedures when compared to females. Among the age groups most of the patients were aged between 21-30 years of age. There are various treatment modalities available for tooth whitening. Dentists should educate patients about the benefits and risks of different whitening methods based on the current research and to suggest the best treatment option based on a correct diagnosis.

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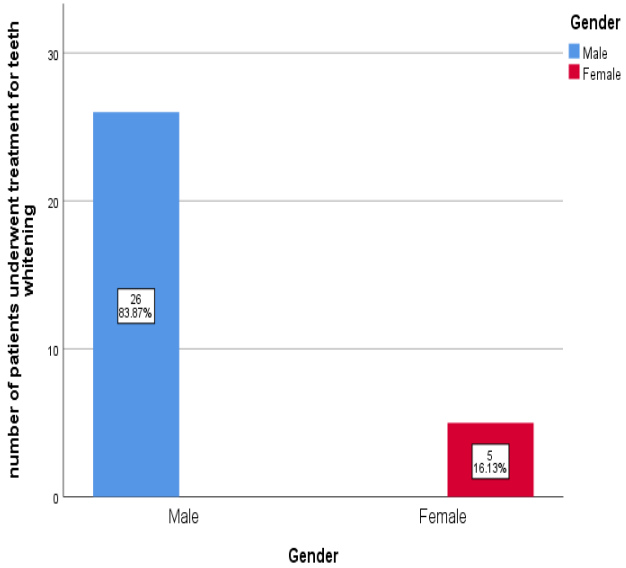

Fig.1: The bar graph depicts the gender of patients who had undergone treatment for teeth whitening. X-axis represents gender and Y-axis represents number of patients who had undergone treatment for teeth whitening; Majority of the patients were males.

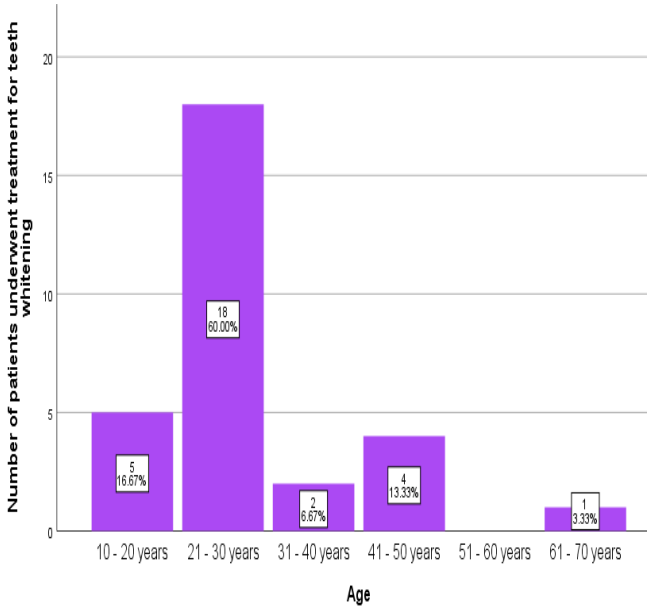

Fig.2 : The bar graph depicts the age of patients who had undergone teeth whitening treatment. X-axis represents age of patients and Y-axis represents number of patients who had undergone teeth whitening treatment. Majority of the patients were aged between 21-30 years.

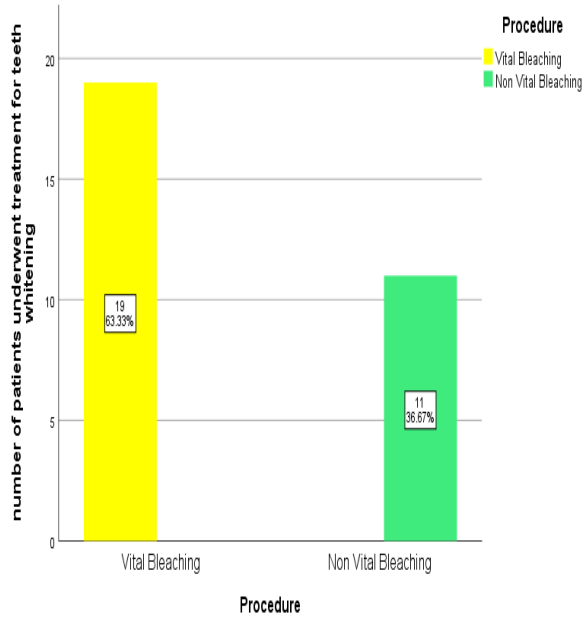

Fig.3: The bar graph depicts the type of tooth bleaching procedures in patients who had undergone teeth whitening treatment. X-axis represents the type of bleaching procedures and Y-axis represents the number of patients who had undergone treatment for teeth whitening. Majority of the procedures undertaken were vital bleaching.

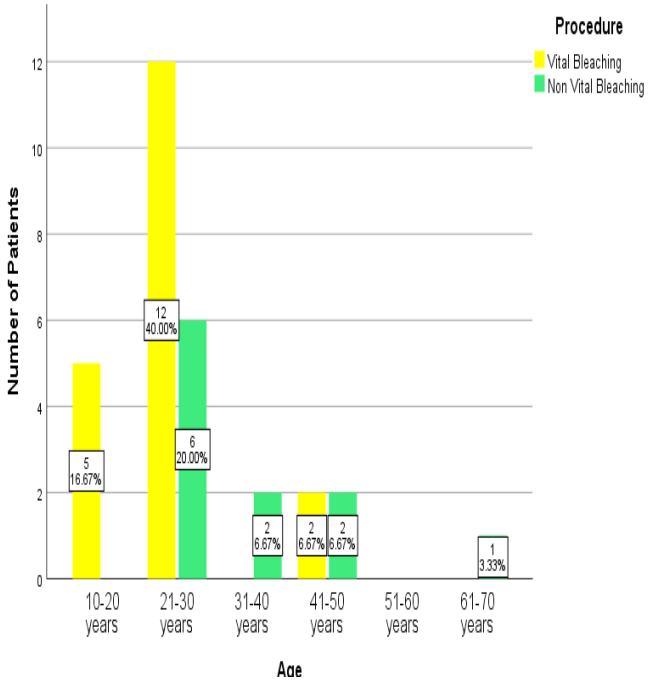

Fig.4: The bar graph depicts association between age and the type of tooth bleaching procedures in patients who had undergone teeth whitening treatment. The X-axis represents the age group and Y-axis represents the number of patients who had undergone teeth whitening with different types of bleaching procedure:vital bleaching;and Non-vital bleaching. Majority of the procedures undertaken were vital bleaching at the age between 21 to 30 years.Chi Square test was done and association was found to be statistically significant, since P value -0.000 (P value < 0.05).

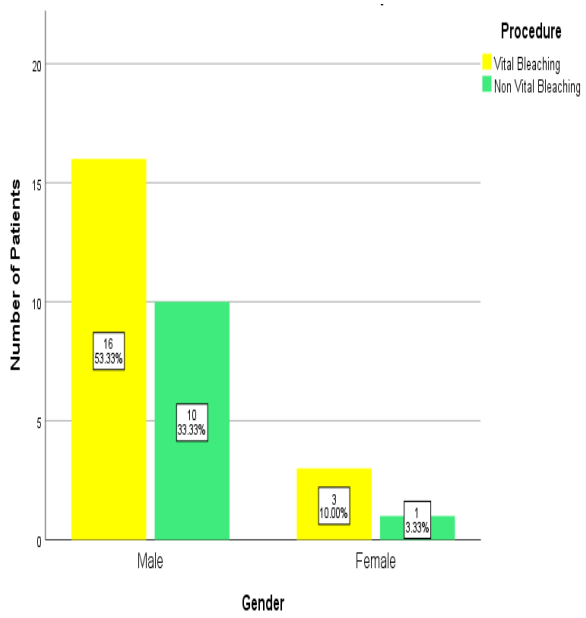

Fig.5: The bar graph depicts the association between gender and the type of tooth bleaching procedures in patients who had undergone teeth whitening treatment. X-axis represents the gender of patients who underwent teeth whitening and Y-axis represents the number of patients who had undergone treatment for teeth whitening with different types of bleaching procedure: vital bleaching; and Non-vital bleaching. Highest number of vital and Non vital bleaching was done among male patients when compared to female patients. Chi Square test was done and association was found to be statistically significant.P value -0.000 (P value < 0.05).

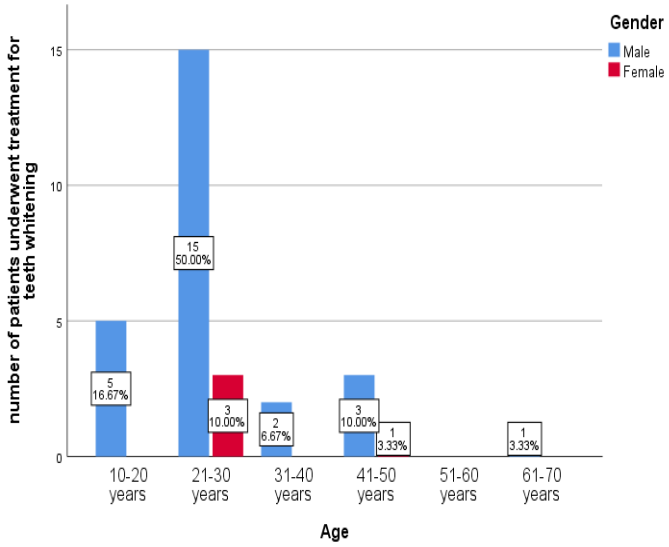

Fig.6 : The bar graph depicts association between a patient's age and gender who had undergone teeth whitening procedures. X-axis represents age and Y-axis represents the number of patients who had undergone treatment for teeth whitening based on gender. Statistical Analysis, Chi-Square test p=0.401, where p>0.05 indicating statistically not significant. There is no association between age and gender of the patients who had undergone tooth whitening procedures. However, the majority of the patients were males and the most common age group was found to be between 21-30 years.