PalArch's Journal of Archaeology of Egypt / Egyptology

ASSESSMENT OF PINK AND WHITE AESTHETIC SCORES AMONG SOUTH INDIAN POPULATION

Chris Noel Timothy[1], *Dr. Suresh V*[2]
[1]Saveetha Dental College,Saveetha Institute of Medical and Technical Sciences - SIMATS,SaveethaUniversity,Chennai, India
[2]ReaderDepartment of prosthodonticsSaveetha Dental College,Saveetha Institute of Medical and Technical Sciences -SIMATS,Saveetha University, Chennai, India
[1]151701002.sdc@saveetha.com,[2]suresh@saveetha.com

Chris Noel Timothy, Dr. Suresh V. ASSESSMENT OF PINK AND WHITE AESTHETIC SCORES AMONG SOUTH INDIAN POPULATION--Palarch's Journal Of Archaeology Of Egypt/Egyptology 17(7), 1298-1305. ISSN 1567-214x

Keywords: aesthetic, anterior, crown, scores, south Indian.

ABSTRACT
The aesthetic demands of patients are elevated in recent days, especially in visible areas such as the anterior region. According to the literature various indices were proposed to evaluate aesthetics in the hard and soft tissues of the oral cavity. Two such indices are the pink aesthetic score (PES) and white aesthetic score (WES). So using these indices, the anterior aesthetic scores were determined among the south Indian population.This cross-sectional study was performed by photographic analysis. A total of 25 subjects and 75 sites. Using the PES/WES by direct comparison with the contralateral reference teeth the results were tabulated. The PES and WES was clearly higher than the average acceptable values. The mean PES (11.33) and mean WES (8.1) scored well above the threshold of 8 for PES and 6 for WES. Dentists and dental technicians must take these scores into account before restoring teeth in order to improve aesthetics among the south Indian population.

INTRODUCTION
A major outlook of dentistry in modern days is to have the placement of pleasant and aesthetic restorations which resemble the natural tooth structure especially in the anterior region [1]. For this we must take into consideration the various factors that affect the aesthetics such as shade, shape, size, etc. of the restoration. Orofacial aesthetics is based on the agreement of both smile and smile lines as well as the face [2]. The aesthetic demands of patients are raised up in recent days, especially in visible areas such as the anterior region [3]. According to the literature and numerous research articles a variety of indices

were put forth to evaluate aesthetics in the hard and soft tissues of the oral cavity. Two such indices are the pink aesthetic score (PES) and white aesthetic score (WES). These were proposed by Furhauser et.al and Belser et.al respectively. So using these indices, the anterior aesthetic scores were determined among the south Indian population. Technological progresses have taken place in response to the mounting demands of the patients for aesthetic dental treatment and the consequential mandate of the clinicians or dental professionals for dental and restorative materials with similar optical features to that of the natural human teeth [4]. In order to attain aesthetic distinction, dentists and dental technicians should comprehend and relate scientific and artistic principles when deciding on the color of restorative material, consistency at which it will be more aesthetically pleasing as well as during the insertion of the restorative material such as composite resin [5,6].

Normally, when handling the aesthetic demands of the patient, dentists mostly focus on the tooth (the white part of aesthetic score) and disregard the gingiva and surrounding soft tissues (the pink part of aesthetic score). Thus far, both these facets need to be taken care of to provide the superlative aesthetic treatment outcome and to right what is either present naturally in the oral cavity or occurred as a result of wear, tear and erosion over the years [7]. Many at times, the pink component or soft tissue component is absent due to widespread gingival and periodontal surgical procedures, trauma, resorption, traumatic extractions, or trauma from occlusion (TFO) [5-8]. Furhauser et al. introduced an excellent index termed the Pink Esthetic Score (PES) for evaluation of the soft tissue around single-implant crowns that might have changed over time. The PES might be a valuable device for observing soft tissue modifications over a long period of time [9]. Belser et al. have later introduced the White Esthetic Score (WES) to explicitly focus on the visible portion of the tooth structure itself [10]. Numerous studies have reported that the PES/WES scoring system can assist as a typical objective assessment tool [11]. However a great emptiness has been observed in clinical ranking and rating approaches to perception of the patient of implant restorations [12]. Therefore, a combination of subjective and objective evaluation of the esthetic product is essential for patients receiving dental restorations and implants in the aesthetic zone [13]. Despite the common use of various indices for the aesthetic evaluation of implants and implant supported prosthesis in the anterior tooth region, there is no unanimously accepted or suggested index available in the current literature and research articles [14]. Aesthetic indices must be reliable and reproducible. According to the original papers for PES/WES it was found that they met the standards of validity, reproducibility and reliability [15]. Therefore we chose these indexes for this study.

PES is based on seven variables: mesial papilla, distal papilla, soft-tissue level, soft-tissue contour, alveolar process deficiency, soft-tissue color, and texture. WES is based on five variables: tooth form, outline and volume, color (hue and value), surface texture and translucency and characterization. Each variable is assessed with a 2-1-0 score, with 2 being the best and 0 being the poorest score, which results in a maximum possible score of 14 for PES and 10 for WES. The aim of this study was to assess the pink and white aesthetic scores among the south Indian population.

MATERIALS AND METHODS

This cross-sectional study was performed by photographic analysis. A total of 25 subjects and 75 sites (the right incisor, lateral incisor and canine) (3 sites per patient) were included. Using the PES/WES by direct comparison with the contralateral reference teeth. The subjects for this study were selected at random at Saveetha Dental College and Hospitals, Vellapanchavadi, Chennai. Intra oral frontal pictures were taken and assessed with the consent of the patient. The photographs were compiled and the results acquired were tabulated and put into the form of charts.

	0	1	2
1: Mesial papilla	Absent	Incomplete	Complete
2: Distal papilla	Absent	Incomplete	Complete
3: Level of soft-tissue margin	>2 mm	1-2 mm	1< mm
4: Soft-tissue contour	Unnatural	Fairly natural	Natural
5: Alveolar process	Obvious	Slight	None
6: Soft-tissue color	Obvious difference	Moderate difference	No difference
7: Soft-tissue texture	Obvious difference	Moderate difference	No difference

Maximum Score: 14

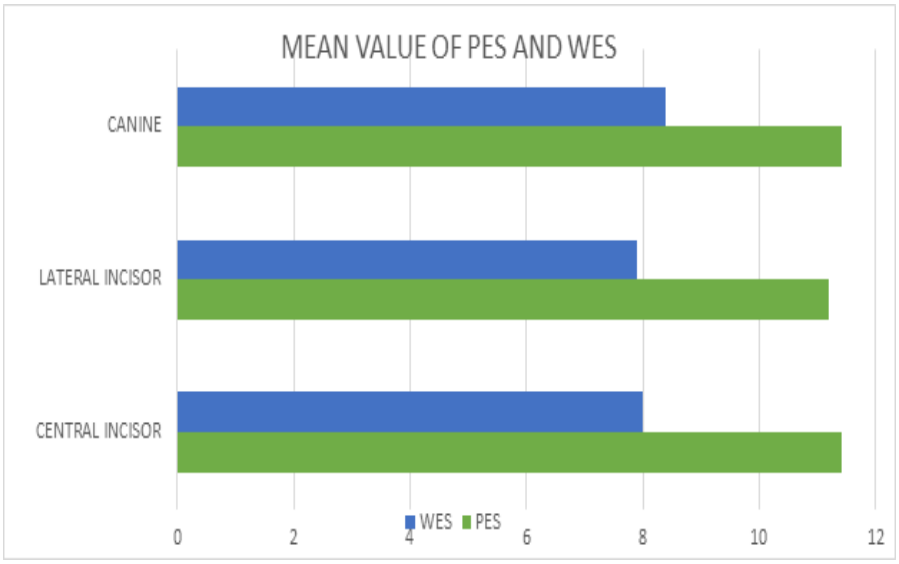
Figure 1 Pink**Aesthetic** Score (PES)

	Major Discrepancy	Minor Discrepancy	No Discrepancy
1: Tooth Form	0	1	2
2: Outline & Volume	0	1	2
3: Color (hue & value)	0	1	2
4: Surface Texture	0	1	2
5: Translucency & Characterization	0	1	2

Maximum Score: 10

Figure 2 White **Aesthetic** Score (WES)

RESULTSAND DISCUSSION



	CENTRAL INCISOR	LATERAL INCISOR	CANINE
PES	11.4	11.2	11.4
WES	8.0	7.9	8.4

Figure 3 (a) and (b) Mean value of PES and WES

Once the results were analyzed and tabulated, the mean total PES/WES was 9.50 for central incisor, 9.55 or lateral incisor and 9.9 for the canine. The overall mean PES was 11.33. Mean PES was 11.4 for central incisor, 11.2 for lateral incisor and 11.4 for the canine. Overall mean WES was 8.1. Mean WES was 8.0 for central incisor, 7.9 for lateral incisor, 8.4 for the canine. The PES and WES was clearly higher than the average acceptable values. The mean PES (11.33) and mean WES (8.1) scored well above the threshold of 8 for PES and 6 for WES.

In a recent study it was found that the PES/WES index is a suitable instrument for evaluating the esthetics around single-implant and other anterior restorations. The PES/WES index could also provide a more unbiased understanding into aesthetic results in the day to day dental practice. Moreover, the index could be a very useful instrument in scientific research and methodology [16]. Objectively, the aesthetic zone was defined as any dento-alveolar segment that is visible upon a complete smile. According to the perspective of the patient, the aesthetic zone can be defined as any dento-alveolar area which is of aesthetic importance to the patient [17]. It is very

essential to distinguish patients who have impractical aesthetic demands. Due to the reason of the intricacy of working with hard and soft tissues in restorative and implant dentistry, it can be problematic to constantly achieve good aesthetic results, therefore, throughout the consultation or during the appointment, it is fitting to discreetly assess the patient's smile line and lip movement during speech and other movements[18]. It is also essential to explain to such patients the reasons for why such a restoration is not possible. More notably, when scheduling restorations in the aesthetic zone of the patient, the clinician must apply other indexes such as the Esthetic Risk Assessment to inform the patient on the risks of attaining an esthetic outcome [19]. One more hurdle to overcome will be broadly and esthetically re-establishing the hard and soft tissue contours once it is lost [20]. Re-establishing contours is both technically difficult and time consuming. Although these indices have good reproducibility and validity, nevertheless, the results from other studies showed that these indices yielded a lack of correlation between dentists as it was subjective. Lack of standardization in the assessment of pink and white aesthetic scores brought about inconsistencies. These inconsistencies depended on the dentist or a dental professional's experience and area of expertise in the field of dentistry, which clearly endangers the final outcome when assessing aesthetics [21]. Likewise, longer follow-ups are required to thoroughly assess the exactness of PES/WES changes over time to predict any differences. Moreover, if confirmed by further research, PES/WES indices may gain ground in the day to day clinical practice to observe long-term changes of anterior restorations and the aesthetics of soft tissues [22,23]. The aesthetic zone might also differ from patient to patient, some of them might have a narrow aesthetic zone while others might possess a wide aesthetic zone. This will also determine the extent to which the final restoration must be designed in order to achieve improved aesthetics [24]. One more complication that may be associated with prosthesis that requires the rehabilitation of lost soft tissue is the need for strict hygiene maintenance by the patient [25]. A recent study showed that the lip form of the patient also influences the aesthetics as it determines the amount of gingiva exposed [26]. Some of such vital parameters have been left out of the PES and WES which proves to be a limitation. Future studies using these indices could bring about modifications which will create an index close to 'ideal'.

It is known that when talking about the esthetics of the smile, premolars should also be involved. However, the present study evaluated only the central incisors, lateral incisors and the canines. This study has limitations due to the number of patients and sites observed and also due to the variety of dental conditions that people presented with especially in the anterior tooth region. This study was also a uni-centered study. Therefore, further studies encompassing a larger number of patients from different dental clinics, hospitals and institutions across the world could help in identifying objective methods of measurement in order to assess esthetic quality and providing gold standard aesthetic treatment and restorations.

CONCLUSION

The average level of natural teeth in PES and WES assessment were around 11 and 8, respectively. Some of the patients with neglected periodontal conditions had poor PES and WES. Few of the patients had poorly made anterior restorations which affected the aesthetic score. Consistent dental checkups, oral hygiene maintenance, early periodontal therapy or restorative therapy and early prosthetic rehabilitation can have an impact on aesthetic score.

ACKNOWLEDGEMENT

I thank my institution Saveetha Dental College for giving me the opportunity to learn the intricacies in research and my guide Dr Suresh for the timely help.

CONFLICT OF INTEREST

Nil

REFERENCES

1. Lanza A, Di Francesco F, De Marco G, et al. Clinical application of the PES/WES Index on natural teeth: Case report and literature review. Case Rep Dent; 2017, https://www.hindawi.com/journals/crid/2017/9659062/abs/ (2017).
2. Tole N, Lajnert V, KovacevicPavicic D, et al. Gender, Age, and Psychosocial Context of the Perception of Facial Esthetics. J EsthetRestor Dent 2014; 26: 119–130.
3. Ashok V, Suvitha S. Awareness of all ceramic restoration in rural population. Research Journal of Pharmacy and Technology 2016; 9: 1691–1693.
4. Jr. EMDEA, de Araujo EM Jr, Fortkamp S, et al. Closure of Diastema and Gingival Recontouring Using Direct Adhesive Restorations: A Case Report. Journal of Esthetic and Restorative Dentistry 2009; 21: 229–240.
5. Nahsan FPS, Mondelli RFL, Franco EB, et al. Clinical strategies for esthetic excellence in anterior tooth restorations: understanding color and composite resin selection. J Appl Oral Sci 2012; 20: 151–156.
6. Jain A, Ranganathan H, Ganapathy D. Cervical and incisal marginal discrepancy in ceramic laminate veneering materials: A SEM analysis. Contemporary Clinical Dentistry 2017; 8: 272.
7. Kurtzman GM. Improving aesthetics: harmonizing the white and pink. Dent Today 2012; 31: 60–62.
8. Jyothi S, Robin PK, Ganapathy D, et al. Periodontal health status of three different groups wearing temporary partial denture. Research Journal of Pharmacy and Technology 2017; 10: 4339–4342.
9. Fürhauser R, Florescu D, Benesch T, et al. Evaluation of soft tissue around single-tooth implant crowns: the pink esthetic score. Clinical Oral Implants Research 2005; 16: 639–644.
10. Belser UC, Grütter L, Vailati F, et al. Outcome Evaluation of Early Placed Maxillary Anterior Single-Tooth Implants Using Objective Esthetic Criteria: A Cross-Sectional, Retrospective Study in 45 Patients With a 2- to 4-Year Follow-Up Using Pink and White Esthetic Scores. Journal of Periodontology 2009; 80: 140–151.

11. Dani S, Prabhu A, Jain KV, et al. Esthetic evaluation of maxillary anterior single-tooth implant by dental specialists and non-dental personnel. International Dental & Medical Journal of Advanced Research 2018; 4: 1–6.
12. Belser UC, Buser D, Hess D, et al. Aesthetic implant restorations in partially edentulous patients ? a critical appraisal. Periodontology 2000 1998; 17: 132–150.
13. Baracat LF, Teixeira AM, dos Santos MBF, et al. Patients' expectations before and evaluation after dental implant therapy. Clin Implant Dent Relat Res 2011; 13: 141–145.
14. Annibali S, Bignozzi I, La Monaca G, et al. Usefulness of the aesthetic result as a success criterion for implant therapy: a review. Clin Implant Dent Relat Res 2012; 14: 3–40.
15. Tettamanti S, Millen C, Gavric J, et al. Esthetic Evaluation of Implant Crowns and Peri-Implant Soft Tissue in the Anterior Maxilla: Comparison and Reproducibility of Three Different Indices. Clinical Implant Dentistry and Related Research 2016; 18: 517–526.
16. Cho H-L, Lee J-K, Um H-S, et al. Esthetic evaluation of maxillary single-tooth implants in the esthetic zone. J Periodontal Implant Sci 2010; 40: 188–193.
17. Morton D, Chen S, Martin W, et al. Consensus Statements and Recommended Clinical Procedures Regarding Optimizing Esthetic Outcomes in Implant Dentistry. The International Journal of Oral & Maxillofacial Implants 2014; 29: 186–215.
18. Renouard F, Rangert B. Risk Factors in Implant Dentistry: Simplified Clinical Analysis for Predictable Treatment. Quintessence International, 2008.
19. Buser D, Belser UC, Wismeijer D. Pre-operative analysis and prosthetic treatment planning in esthetic implant dentistry. In: Buser D, Belser UC, Wismeijer D (eds) Implant Therapy in the Esthetic Zone for Single-Tooth Replacements. Berlin: QuintessenzVerlags GmbH, 2006, p. 16.
20. Boardman N, Darby I, Chen S. A retrospective evaluation of aesthetic outcomes for single-tooth implants in the anterior maxilla. Clin Oral Implants Res 2016; 27: 443–451.
21. Burgueno-Barris G, Cortes-Acha B, Figueiredo R, et al. Aesthetic perception of single implants placed in the anterior zone. A cross-sectional study. Medicina Oral Patología Oral y CirugiaBucal 2016; 0–0.
22. Altay MA, Sindel A, Tezerişener HA, et al. Esthetic evaluation of implant-supported single crowns: a comparison of objective and patient-reported outcomes. International Journal of Implant Dentistry 2019; 5: 2.
23. Jain AR, Nallaswamy D, Ariga P, et al. Determination of correlation of width of maxillary anterior teeth using extraoral and intraoral factors in Indian population: A systematic review. World J Dent 2018; 9: 68–75.
24. Ganapathy D, Sathyamoorthy A, Ranganathan H, et al. Effect of resin bonded luting agents influencing marginal discrepancy in all ceramic complete veneer crowns. J ClinDiagn Res 2016; 10: ZC67.

25. Kolakarnprasert N, Trushkowsky R, Ac OP, et al. Effective Utilization of Pink and White Esthetics in Smile Design: Case Report. CompendContinEduc Dent 2020; 41: 34–41.
26. Kim J, Topolski R, Dickinson D, et al. The influence of lip form on incisal display with lips in repose on the esthetic preferences of dentists and lay people. J Prosthet Dent 2017; 118: 413–421.