Original Article

Comparison of perception of smile by orthodontists and other specialty dentists: A questionnaire study

ABSTRACT

Aim: The purpose of this study is to compare the perceptions of orthodontists and other specialty dentists, regarding smile esthetics in the form of a questionnaire.

Objectives: To determine whether there is any difference of opinion regarding the perception of smile between orthodontists and other specialty dentists and to compare the various factors that have a high impact on the perception of smile by orthodontists and other specialty dentists.

Materials and Methods: This study is a questionnaire survey. Totally, 104 questionnaires were distributed, of which 52 patients were completed by the orthodontists and 52 patients were completed by other specialty dentists.

Results: This study showed that the mean scores given by orthodontists are lesser than that of the nonorthodontists. The factors that had an impact on smile by nonorthodontists include crowding of lower anterior teeth and diastema of 3–4 mm. Among orthodontists, the various factors that had an impact include diastema, midline deviation, and reverse smile arc.

Conclusions: Different parameters have an impact on the smile perception. Diastema, smile, and reverse smile were regarded as unattractive and received the lowest score in this survey. The presence of midline shift was not considered unaesthetic by nonorthodontists.

Key words: Aesthetic smile; comparison of smiles; smile perception.

Introduction

The reemergence of the soft tissue paradigm in clinical orthodontics has made smile analysis a key element in diagnosis and treatment planning.[1] As an attractive, well-balanced smile is one of the important treatment objectives of modern orthodontic therapy, extensive studies on facial features have resulted in the establishment of norms that orthodontists use as guidelines to evaluate facial forms to direct therapy. Smile analysis includes evaluating the smile arc, tooth[2] and gingival display, presence of buccal corridor space (BCS), midline coincidence, tooth proportionality, gingival esthetics, shade of teeth, and cant of the occlusal plane. The esthetics of a smile is influenced by features such as the presence of BCSs, the amount of gingival display,[3] and the presence of a midline diastema. The influence of buccal corridors on smile esthetics has been noted by some investigators to be of no esthetic consequence,[4] whereas others believe that it is unattractive.[5-7] A smile demonstrating minimal gingival display has been deemed more esthetic than one with the excessive gingival display. Geron et al.[8] reported that upper gingival exposure of up to 1 mm was regarded as attractive. Kokich et al.[9] reported that the lay and orthodontic groups rated a 3 mm distance as unattractive. The presence of a midline diastema produces an unattractive smile. Rodrigues et al.[10] reported that large midline diastema negatively influenced smile esthetics while a midline diastema of up to 1.5 mm was

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regarded as attractive.[9] The perception of esthetics varies from person-to-person and is influenced by personal experiences and social environment.[11] For the same reason, there can be differences of opinion regarding esthetics between laypeople and professionals.[12] Whereas Roden-Johnson *et al*.[4] and Pinho *et al*.[13] reported that general practitioners, orthodontists, and laypersons evaluated smiles differently. Ioi *et al*.[5] found that orthodontists and dental students rated the attractiveness of smiling photographs similarly. However, other researchers reported that smile attractiveness did not differ between dental professionals and laypeople.[6,14] Many factors can influence the formation of esthetic beauty standards including culture.[15] Although many studies have been published on smile esthetics, this was the first regarding the perception of esthetic smiles among Indians. The aims of this study were to rate the attractiveness of different smile variables such as diastema, BCS, gingival display, midline deviation, crowding of anterior teeth, and reverse smile arc.

The purpose of this study is to compare the perceptions of orthodontists and other specialty dentists regarding smile esthetics in the form of a questionnaire.

Materials and Methods

The study subjects comprised 104 participants, 52 orthodontists, and 52 nonorthodontists. The original photograph (ideal smile) was then manipulated using image processing software (Adobe Systems, San Jose, California, USA) to produce a series of images with midline diastema, gingival display, and BCS of varying degrees. The entire facial photograph was not used to eliminate the influence of the nose and chin and thereby reduce the number of confounders. Each esthetic characteristic was altered to varying degrees.[9]

The questionnaire was based on these sets of altered smile photographs [Figures 1-6]. The importance of an attractive smile for the rater, the satisfaction of the rater regarding his/her own smile, the desire for changing the rater's smile, the impact of the smile in social life, and the importance of different smile variables were evaluated using the Likert scale (very high = 1, high = 2, medium = 3, low = 4, and very low = 5). The photographs of the different manipulated smiles were presented in a catalog and evaluated by the subjects using the rating (very attractive = 1, attractive = 2, accepted = 3, unattractive = 4, and very unattractive = 5).[16]

Statistical analysis

Data analysis was carried out using the Statistical Package for Social Science (version 9.0; SPSS Inc., Chicago, Illinois, USA). The mean and standard deviation (SD) of each group were calculated. Comparison between the groups was performed using the univariate general linear model, which was selected to test the effect of independent factors on smile attractiveness as well as the interactions between these factors.

Results

A bar graph shows the scores given by rater's for each smile variation [Figure 7]. The means and SDs for questions related to the impact of the smile on the subjects are shown in Table 1. Higher scores on the visual analog scale (VAS) scale indicate less impact.
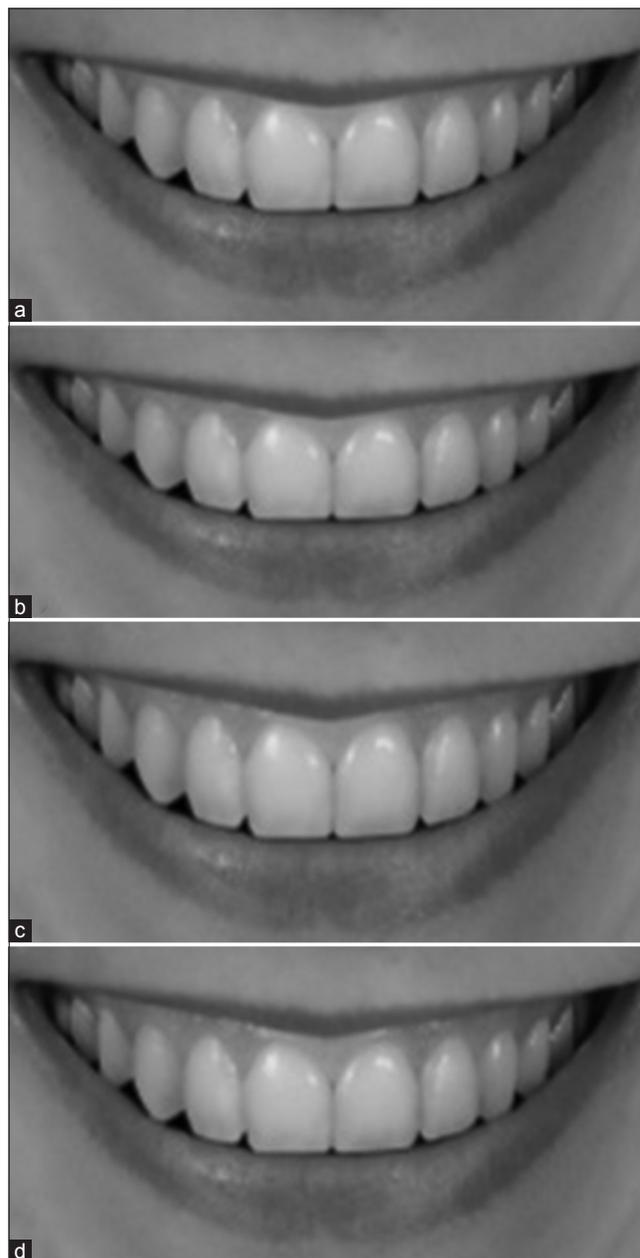

Figure 1: Variation in gingival display (a). Gingival exposure by 1 mm (b). Gingival exposure by 2 mm (c). Gingival exposure by 3 mm (d). Gingival exposure by 4 mm
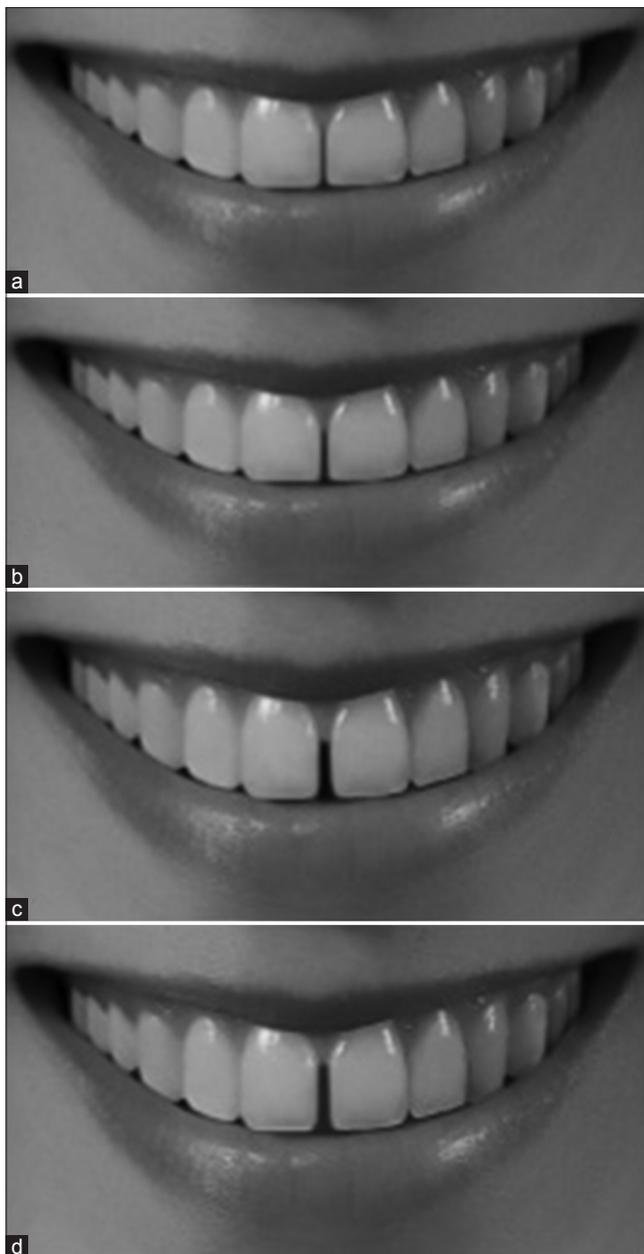
Figure 2: Variation in midline diastema (a). Midline diastema by 1 mm (b). Midline diastema by 2 mm (c). Midline diastema by 3 mm (d). Midline diastema by 4 mm

This study shows that the mean scores given by orthodontists are lesser than that of the nonorthodontists. The factors that had an impact on smile by nonorthodontists include crowding of lower anterior teeth (4.29) and diastema of 3–4 mm (3.54, 3.37). Among orthodontists, the various factors that had an impact include diastema (4.18, 4.31), midline deviation (4.56), and reverse smile arc (4.27).

Discussion

This research focused on these aspects of smile esthetics:[17] Diastema, BCS, gingival display, midline deviation, crowding of

Figure 3: Midline deviation

Table 1: The mean scores given by orthodontists and nonorthodontists for each smile variation

Variables	Nonorthodontists ($n=52$)	Orthodontists ($n=52$)
BCS		
Narrow	2.21±0.89	2.77±0.83
Wide	2.56±0.89	2.77±0.80
Gingival display (mm)		
1	1.96±0.74	2.25±0.94
2	2.15±0.75	3.31±0.75
3	3.17±0.85	3.85±0.69
4	3.6±0.89	3.81±0.84
Diastema (mm)		
1	2.02±0.75	2.25±0.78
2	2.62±0.93	2.96±0.81
3	3.54±0.99	4.18±0.76
4	3.37±0.68	4.31±0.67
Moderate crowding in lower anteriors	4.29±0.69	4.23±0.67
Mild crowding in lower anteriors	3.04±0.81	3.79±0.75
Reverse smile arc	2.35±0.94	4.27±0.68
Midline deviation	3.0±0.99	4.56±0.50

BCS: Buccal corridor space

anterior teeth, reverse smile arc, etc.,[18] In this study, the raters were of two groups: Orthodontists and nonorthodontists and of different gender and age to investigate the effect of these variables on smile attractiveness rating. The photographs used in this study were limited to the mouth to reduce the effect of confounders. Kokich *et al.*, Martin *et al.*, and Moore *et al.*[5,6,7,9] reported that the size of the BCS influences smile attractiveness when the full face is taken in context. In this study, photographs of different smiles were evaluated using different rating scores (very attractive, attractive, acceptable, unattractive, and very unattractive). Other researchers[4,5,19,20] used a VAS to judge smile attractiveness. Using the former method in rating, esthetics produces simple, rapid, and reproducible results, whereas a VAS may mean different things to different raters two and raters will use certain portions of the scale and ignore others.[21] Attractiveness is suggested to

Figure 4: Reverse smile arc

Figure 6: Lower anterior crowding

Figure 5: Buccal corridor space (a) narrow, (b) wide
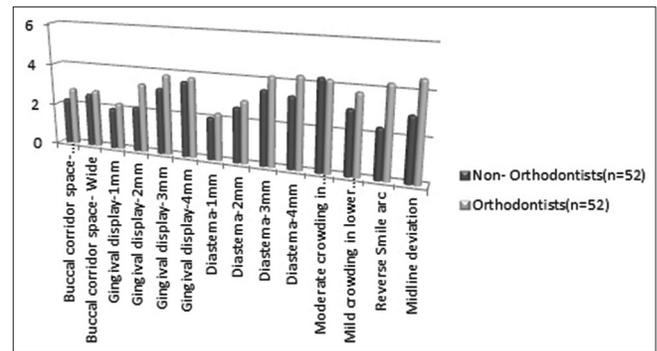
Figure 7: A bar graph showing the scores given by raters for each smile variation

influence social interaction. In this study, the impact of an attractive smile on social acceptance was rated high by all groups. This was in agreement with Van der Geld et al.[22] who emphasized the importance of an attractive smile on social acceptance. In this study, age did not affect the rating of smile attractiveness, whereas the profession and gender of the raters had an effect. This is in agreement with the findings of Gracco et al.[23] and Martin et al.[6] who reported that the age of the rater did not affect attractiveness rating of BCS. This was in contrary to the results of Moore et al.[7] and Ioi et al.[5] who suggested that males and females rated smile attractiveness similarly. However, the fact that the evaluators in this study were all adults may explain the lack of age influence. The rating of the attractiveness of BCS was not affected by age or gender. This is in agreement with other studies by Moore et al., 2005; Gracco et al., 2006; Martin et al., 2007; Ioi et al., 2009.[5,6,7,23] However, the profession of the rater affected smile attractiveness scores in the presence of BCS. This is contrary to the findings of Krishnan et al. and Ioi et al.[5,19] who reported that orthodontists and dental students had similar tendencies in scoring the preferences of BCS.

The findings of this study showed that nonorthodontists accept a wider range of deviation compared to the orthodontists. Therefore, when esthetic treatment to obtain a harmonious smile is performed, clinicians must be careful about imposing his/her own beauty norms on patients. The type and degree of deviation from the norm and the opinion of the patient need to be taken into consideration. The limitations of this study include:

- The use of a female smile as the only model image as it has been shown that the gender of the model smile image affects smile attractiveness[8]
- The lack of comparison of smile perception in lay people.

Conclusions

- Different parameters have impact on the smile perception
- Diastema smile and reverse smile were regarded as unattractive and received the lowest score in this survey
- The presence of midline shift was not considered unaesthetic by nonorthodontists.

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Conflicts of interest

There are no conflicts of interest.

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