

Original Article

Perception of smile attractiveness toward various forms of anterior diastemas among undergraduate dental and nondental students: A questionnaire-based study

ABSTRACT

Background: Smiling is the evident component of facial attractiveness. Midline diastema is considered in some cultures as unattractive and as a malocclusion, especially in Western countries while it is considered as a sign of beauty in Africa and Middle-East.

Aim: The aim of this study is to compare the smile attractiveness perception of dental and nondental students toward anterior diastemas and to determine whether all spaces in the esthetic zone are considered unattractive as midline diastema.

Materials and Methods: This is a descriptive cross-sectional study conducted among 156 dental and pharmacy students from the University of Medical Sciences and Technology, Sudan, from December 2015 to January 2016. A self-administered questionnaire was distributed to the participants and it consisted of two parts: part one – related to gender, faculty, educational level, and questions about dental diastema, and part two – containing four modified pictures of a young female's smile modified by photoediting software to create different spaces between anterior teeth (midline, Simian, Frush and Fisher, and Lombardi diastema). Participants were asked to rank the pictures according to attractiveness from the most to the least attractive using visual analog scale. Comparison between variables was made by Chi-square test with $P < 0.05$.

Results: Smile attractiveness from the most to the least attractive was Simian > Frush and Fisher > midline > Lombardi among both dental and pharmacy students. Gender and presence of diastema had no relation with the student's perception ($P > 0.05$). There was a significant statistical difference between dental and pharmacy students regarding Frush and Fisher diastema ($P = 0.034$). Most of the students with diastema felt shy when smiling.

Conclusions: The location and width of diastema had an important role on the attractiveness perception of dental diastemas. Midline diastema was not a gap with the most negative perception.

Keywords: Attractiveness, dental students, midline diastema, pharmacy students, smile perception, teeth spacing

INTRODUCTION

Dental appearance is a key factor in the determination of facial attractiveness and plays a significant role in human social life.^[1] People's interest about the beauty and the attractiveness of their teeth began 2000 years ago. The definitions of dental beauty differs in different cultures and across time, where diastema was considered a sign of beauty in the 1960s and 1970s, but nowadays most of the people demand dental treatment for its closure.^[2]

In social situations, substantial attention is focused toward an individual's mouth and eyes when speaking. The oral

region of the face, when expressing happiness, i.e., smiling, is the evident component of facial attractiveness.^[3] Smile plays a major role in self-perception of an individual and

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acts as an important element of physical attractiveness and facial expression.^[4]

Spaced dentition is the lack of contact points and the presence of interdental spaces between the teeth. Spacing can be localized or generalized; it is of a major esthetic problem for many patients. A study in European adults revealed that patients having broad midline spacing were perceived of having lower intelligence and of being less socially successful.^[5]

Diastema is a characteristic space between two teeth. The midline diastema is a space more than 0.5 mm between the two mesial surfaces of central incisors.^[6] It is a common feature of anterior dentition and the needs for treatment are primarily of psychological and esthetic reasons more than for functional reasons.^[7]

Perception of midline diastema varies among different cultures; like in France, the teeth on either side of the diastema are called “dents du bonheur” or “lucky teeth.”^[8] In many cultures, tooth shape and color play a pivotal role in the marriage prospects of a woman. The perception to midline diastema differs in different cultures, Caucasians generally consider it as unattractive and as a malocclusion while it is regarded as an attractive feature in both Africa and the Middle-East.^[6]

Many researches were done to evaluate the perception of smile attractiveness toward midline diastema, but a few researches were done to determine the perception of smile attractiveness toward different forms of anterior diastemas. The objectives of this study were to compare the smile attractiveness perception of dental and nondental students toward anterior diastemas and to determine whether all spaces in the esthetic zone are considered unattractive as midline diastema.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted from December 2015 to February 2016, among undergraduate students from the Faculty of Dentistry and Faculty of Pharmacy (University of Medical Sciences and Technology, Sudan). To avoid type 11 error, not all the students from both faculties were included; only 4th and 5th year students, where the sample size was 186 determined as the total coverage of these two classes from both faculties. The number of the students from dentistry was 93 (4th year = 44, 5th year = 49) and from pharmacy was 93 (4th year = 45, 5th year = 48).

The questionnaire consisted of two parts: first part was related to demographic data such as gender, faculty,

educational level, and questions about dental diastema, and the second part showed four modified pictures of different spacing between anterior teeth. One of the dental students having midline diastema volunteered to photograph her teeth and to modify her picture digitally for the purpose of the study. She signed informed written consent and she was excluded from participating in the study. The picture was modified using photoediting software to create different spaces between the anterior teeth. Diastemas created were similar to that used in previous studies.^[9-11] They were a moderate midline diastema [Figure 1a], asymmetrical diastemas between the canine and the lateral incisor on one side and between the lateral and central incisors on the other side (Frush and Fisher diastema) [Figure 1b], slight midline diastema and two larger diastemas between the central and lateral incisors (Lombardi diastema) [Figure 1c], and symmetrical diastemas between the lateral incisors and the canines (Simian diastema) [Figure 1d]. Participants were asked to rank the pictures using a visual analog scale from 1 to 4 (1 being the most attractive, 2 as attractive, 3 as less attractive, and 4 as the least attractive).

The questionnaire was piloted by ten students from the 5th year dental students to estimate the time required to complete the questionnaire and to determine the validity, reliability, and comprehensibility of questions and was refined accordingly. The objectives of the study were explained to the participants before they started to answer the questions and they were given 10 min to fill the questionnaire during one of the morning lectures after obtaining permission from the teachers of that lecture, and they accepted to wait outside the class till they filled the questionnaires. Their participation was voluntary and they signed informed written consent. The study was approved by the Ethical Committee of the University of Medical Sciences and Technology. The data collection forms were checked for completeness before data processing and then

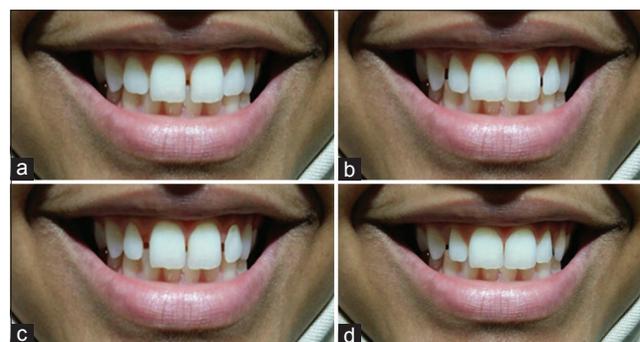


Figure 1: Modified picture of a volunteer student using photoediting software created different diastemas between upper anterior teeth. (a) Midline diastema (b) Frush and Fisher diastema (c) Lombardi diastema (d) Simian diastema

entered regularly into Statistical Package for Social Sciences (SPSS) program (SPSS; version 16 Inc., Chicago, IL, USA) for analysis. Comparison between different variables was made by Chi-square test with the level of significance set at $P < 0.05$.

RESULTS

The response rate was 100%. The students ranked midline diastema differently; less attractive constituted 35% as shown in Figure 2. Nearly 47% of the students ranked Frush and Fisher diastema as attractive [Figure 3], 64.1% of the students ranked Lombardi diastema as the least attractive [Figure 4], and 58% of the students ranked Simian diastema as the most attractive [Figure 5].

Regarding the impact of the anterior diastema on the student's social life, almost half of the students (54.3%) said they were not affected by its presence. Unpleasant feelings when smiling were associated with the presence of diastema among almost half of the students (48%) and they thought it has an effect on their social life.

The association between students' gender differences and the perception toward anterior diastemas was found to be insignificant $P > 0.05$ [Table 1]. when perception was compared between students from the two faculties, statistical

significant difference was found with Frush and Fisher diastema with a $P = 0.034$ [Table 2].

DISCUSSION

The present study comprised two parts, the first part containing questions about gender, faculty, presence of dental diastema, and the relation between dental diastema and student's social life while the second part encompassing modified pictures of a young woman's smile using photoediting software. The smile was modified to create four types of anterior diastemas. On the first part, it has been observed that the majority of the participants were females, and most of them did not have dental diastema. Midline diastema was the diastema with the highest prevalence in both dental and pharmacy students who participated in the study. In agreement with many previous studies,^[12-15] it can be perceived that smile attractiveness is affected by the proportion and shape of the teeth, proximal contact areas, and gingival zenith, among which diastema is considered one of the factors.

Diastema affects the student's social life as the majority of them feel shy when smiling, these results are similar to a study done in European adults showing that patients having a spacing in their teeth were found to be less socially successful.^[5]

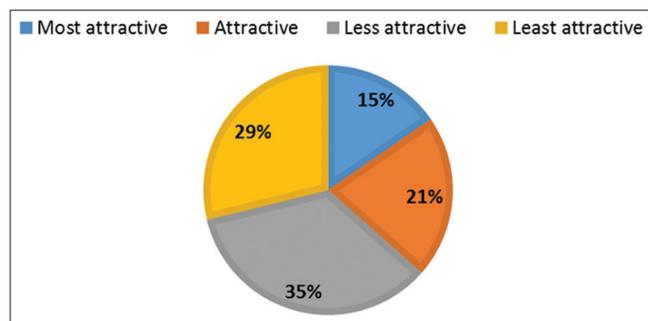


Figure 2: The perception of students toward midline diastema according to its attractiveness

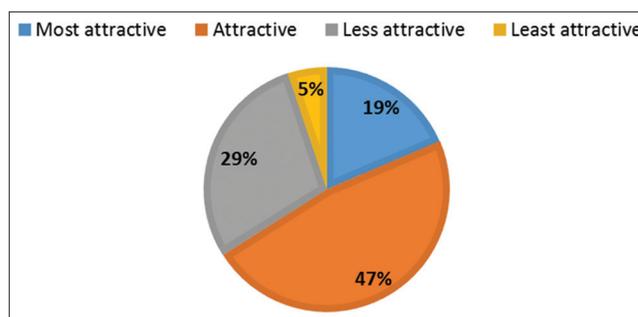


Figure 3: The perception of students toward Frush and Fisher diastema according to its attractiveness

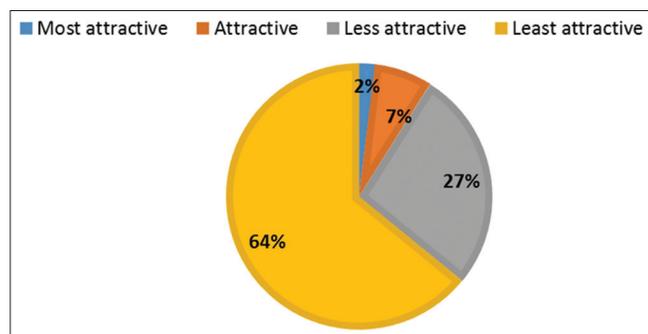


Figure 4: The perception of students toward Lombardi diastema according to its attractiveness

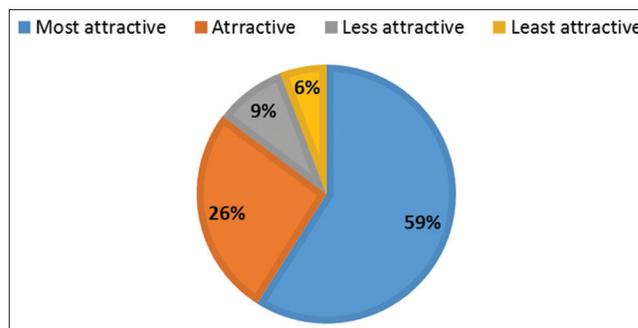


Figure 5: The perception of students toward Simian diastema according to its attractiveness

Table 1: The association between students' gender differences and the perception toward anterior diastemas

Diastema	Gender	Ranking				P
		Most attractive (%)	Attractive (%)	Less attractive (%)	Least attractive (%)	
Midline	Female	21 (13.5)	26 (16.7)	34 (21.8)	33 (21.2)	0.117
	Male	3 (1.9)	7 (4.5)	20 (12.8)	12 (7.7)	
Frush and Fisher	Female	24 (15.4)	50 (32.1)	35 (22.4)	5 (3.2)	0.323
	Male	5 (3.2)	24 (15.4)	10 (6.4)	3 (1.9)	
Lombardi	Female	1 (6)	8 (5.1)	34 (21.8)	71 (45.5)	0.267
	Male	2 (1.3)	3 (1.9)	8 (5.1)	29 (18.6)	
Simian	Female	64 (41)	33 (21.2)	10 (6.4)	7 (4.5)	0.606
	Male	28 (17.9)	8 (5.1)	4 (2.6)	2 (1.3)	

Table 2: The association of perception toward anterior diastemas between students from the Faculty of Dentistry and Pharmacy

Diastema	Faculty	Ranking				P
		Most attractive (%)	Attractive (%)	Less attractive (%)	Least attractive (%)	
Midline	Dentistry	17 (10.9)	18 (11.5)	30 (19.2)	21 (13.5)	0.295
	Pharmacy	7 (4.5)	15 (9.6)	24 (15.4)	24 (15.4)	
Frush and Fisher	Dentistry	10 (6.4)	43 (27.6)	30 (19.2)	3 (1.9)	0.034
	Pharmacy	19 (12.2)	31 (19.9)	15 (9.6)	5 (3.2)	
Lombardi	Dentistry	1 (0.6)	5 (3.2)	19 (12.2)	61 (39.1)	0.256
	Pharmacy	2 (1.3)	6 (3.8)	23 (14.7)	39 (25)	
Simian	Dentistry	51 (32.7)	22 (14.1)	8 (5.1)	5 (3.2)	0.996
	Pharmacy	41 (26.3)	19 (12.2)	6 (3.8)	4 (2.6)	

There was a conflict between those with diastema and others without diastema in that students without diastema highly disagreed that midline diastema is a sign of beauty, this can explain that they have more self-satisfaction of their smile appearance and thinks that their smile is ideal while those who have diastema got adapted to it. This shows similarity to a study done by Akinboboye *et al.*, 2015, in Nigeria where participants who had diastema had the highest preference for midline diastema.^[6] While it was dissimilar to the study done by Umanah *et al.*, 2015, in Nigeria where those who did not have diastema wanted to create midline diastema through cosmetic dentistry.^[6]

The second part of the present study aimed to determine the perception of both dental and pharmacy students. Both dental and pharmacy students ranked Simian diastema as the most attractive followed by Frush and Fisher diastema, midline diastema, and finally Lombardi diastema.

In contrast to the study by Al Nazeh, 2016,^[17] our study showed that gender had no relation with the student's perception of smile attractiveness, while there was a significant difference between dental and pharmacy students regarding Frush and Fisher diastema as dental students ranked it attractive more than pharmacy students, and no explanation was found for these findings.

Simian and Frush and Fisher diastema were ranked as the two most attractive smiles, where both of them have bilateral

gaps; whereby midline and Lombardi diastemas were ranked as the two least attractive diastemas as both of them have a gap on the midline. This indicates that the midline diastema; have an important role on smile attractiveness.

Lombardi diastema (smile with distributed diastemas) was ranked as the least attractive, in spite of having only a small gap on the midline. Midline diastema was ranked as less attractive although it has a larger diastema on the midline. This demonstrates that the width and location of diastema have an important role on smile attractiveness.

Midline diastema was more accepted than Lombardi diastema. Lombardi diastema was the gap with the most negative effect on smile. The present study shows discrepancy to the results of a study done by Nouredine *et al.*, 2014, in France where midline diastema was the gap with the most negative effect on smile.^[9]

The results of the present study were similar to the results of a web-based study done by Rosenstiel and Rashid, 2002, in the United States and Canada, where respondents younger than 40 years old strongly rejected midline diastema.^[18]

This study illustrates differences to the study done by Umanah *et al.*, 2015, in Nigeria, where maxillary midline diastema was desired and considered an attractive feature.^[6]

These contrasting results maybe due to the different cultures as it is known that midline diastema is considered a sign of beauty in Africa while it is considered a malocclusion in Caucasians.^[6]

A small midline diastema was not rated as unattractive by any group in a study done by Thomas *et al.*^[19] and Swetha and Christine,^[20] in contrast to our study where Lombardi diastema which has a small midline diastema was rated as the least attractive, similar results were obtained by others,^[21-23] which suggests that there is a relation between the size of the diastema and smile attractiveness.

This study shows some limitations as only the perception of the 4th and 5th year dental and pharmacy students was evaluated and the width of diastema was not measured while creating spaces.

CONCLUSIONS

Smile attractiveness according to different diastemas from the most to the least attractive was as follows: Simian diastema > Frush and Fisher diastema > midline diastema > Lombardi. Lombardi diastema was the gap with the most negative influence on smile. Location and width of diastema had an effect on smile attractiveness and feeling shy when smiling. Dentists should be aware when treating a smile with excessive anterior spacing and should always keep in mind that the perception of smile attractiveness varies according to the individual's age, gender, and culture.

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Conflicts of interest

There are no conflicts of interest.

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