

Perception of midline diastema in dental- and nondental-oriented individuals

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ABSTRACT

Background: The perception of maxillary midline diastema differs in different individuals and continent. Culture and other factors are believed to influence the perception of maxillary midline diastema. The aim is to determine the influence of dental knowledge on the perception of maxillary midline diastema. **Materials and Methods:** Study was done in Nigeria, which consists of diverse ethnic and social African groups. A two-stage sampling method was done to select participants between the ages 20 and 49 years. Participants were randomly selected from the University of Lagos and Teaching Hospital, Lagos, Nigeria. A structured questionnaire including a set of color smile photographs with varying sizes of maxillary midline diastema (narrowest = 2 mm; widest = 6 mm) was administered, and grading of attractiveness of smile was done. This information was evaluated using a Likert scale. **Results:** Study participants were 89 and age range was between 20 and 49 years with the mean age being 27.9 ± 7.9 years. Female participants were 49.4%, while male was 50.6%. The proportion of those who were medically inclined was 47.2% and those that were nonmedically inclined were 52.8%. Prevalence of midline diastema was 16.9%. About 52% of the medically inclined and 48.9% of nonmedically inclined participants rated maxillary midline diastema of 4 mm as acceptable ($P = 0.02$). At 6 mm width, there was a general rating of unattractiveness with 83.3% medically inclined and 66% nonmedically inclined participants rating it unattractive ($P = 0.03$). A higher percent (73.8%) of the medically inclined participants did not like midline diastema ($P = 0.00$). **Conclusion:** This study was able to demonstrate the perception of maxillary midline diastema in dental and nondental professionals.

Keywords: Dental, diastema, knowledge, midline

INTRODUCTION

Interests concerning beauty and attractiveness of smile have been initiated 2000 years ago.^[1] Cultural definition on dental beauty differs in individual, different countries, and continent.^[2] In Africa, most especially Nigeria, maxillary midline diastema is seen as a symbol of beauty,^[3,4] while people in some countries, especially in Europe and America, do not see it as such. Previous

studies have documented that patients with maxillary midline diastema seek for treatment to improve their appearance by orthodontic treatment or restorative veneers.^[5-7]

Maxillary midline diastema has been reported to be a common esthetic problem that dentists must treat.^[8] Other reports have stated that maxillary midline diastema becomes a problem when it is >4 mm.^[5] Previous studies done among Africans observed that it was common among some Africans to demand for artificially created midline diastema.^[9,10] However, the majority of the dentists did not support the artificial creation of midline diastema.^[10] The reason for their disapproval may be

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as a result of their training which is based on textbook and norms from Western societies. Culture is defined as learned behavior, which has been socially acquired,^[11] and in other words “it is the shared and organized body of customs, skills, ideas, and values, transmitted socially from one generation to other.^[12] Culture lays down norms of behavior and provides mechanisms that secure for an individual, his personal, and social survival.^[13] Culture includes everything that one generation can tell, convey, or hand down to the next. It is an experience that is learned, shared, and transmitted.^[14] The role of views on diastema is also very controversial. It is, therefore, necessary to study the conflict of culture and Western education, especially on what constitutes a norm by Nigerians vis-a-vis maxillary diastema with the purpose of determining the influence of dental knowledge on the perception of midline diastema.

MATERIALS AND METHODS

This is an analytic cross-sectional study which consists of diverse ethnic and social African. A two-stage sampling method was done to select participants between the ages 19 and 49 years (at this age, active tooth growth and movement are not present) who had no refractory eye defect problem and had no orthodontic treatment. Participants were from the faculty of dental sciences located inside the Lagos University Teaching Hospital, Idi Araba, Lagos and University of Lagos, Akoka campus. Participants were students and staff selected in faculty of dental sciences into Group A (dentally inclined). Furthermore, participants were selected from University of Lagos into Group B (not dentally inclined). Willing participants who met the inclusion criteria (mentioned above) and from whom informed consent was obtained participated in the study. Recruitment and data were collected over a period of 3 months (May–July 2015).

A total of 89 participants took part in this study (42 participants in Group A and 47 in Group B). A pretested structured questionnaire was administered to the participants by three calibrated investigators. The questionnaire sought for information such as age, gender, and profession. Furthermore, participants were asked to rate their smile (self-perception) and indicate whether they have maxillary midline diastema or not (this was confirmed by investigators who were dentists). The questionnaire also sought to know whether the participants would like to have maxillary midline diastema. The questionnaire included a set of colored smile photograph taking with a digital camera and obtained from an African female smile in the frontal

pose. The original photograph was digitally manipulated using image-processing software (Adobe Systems, San Jose, California, USA) to give smile photographs with varying sizes of diastema with the narrowest at 2 mm and widest at 6 mm. The nose and chin were not included in the photograph; this was to reduce cofounders (shift visual attention from midline diastema). Participants were required to rate the different colored photographs using the rating scale (very attractive = 1, attractive = 2, accepted = 3, unattractive = 4, and very unattractive = 5).^[15] The codes were later collapsed by combining codes 1/2, and codes 4/5 to give attractive, acceptable, and unattractive during analysis. Participants were interviewed individually to avoid conference response to questionnaire so as to reduce bias.

Participants were classified into three socioeconomic status^[16] as follows; Class 1 - skilled workers, for example, professionals and managerial officers and retirees of this cadre, Class 2 - unskilled workers, for example, Artisans and traders, Class 3 – dependents, for example, retirees of Class 2, those not on pensions, housewives of Class 2 cadre, students whose parents are unskilled workers. Ethical approval was obtained from Lagos University Teaching Hospital Ethical Committee.

Data were analyzed using SPSS 16 statistical software for windows (version 16.0 SPSS Inc., Chicago, IL, USA). Questionnaires with missing variable or any missing data of any were not included in the analysis. The results were presented in the form of frequency table and cross tabulation. Chi-square test was done for proportionate variables to determine statistical significance. The statistical significance of outcomes was evaluated at 95% confidence level, and significant association was determined if $P \leq 0.05$. Ethical approval for the study was obtained on 15th February 2016 by the Lagos University Teaching Hospital Ethics Committee.

RESULTS

The total number of the study participants was 89. The age range was between 19 years and 49 years with the mean age being 27.9 ± 7.9 years. The number of female participants was 44 (49.4%) whereas that of male was 45 (50.6%). Age, gender, and ethnic group did not have any significant influence in participant liking gap teeth [Table 1].

The proportion of those who were dentally inclined was 47.2% (42) and those that were nondentally inclined were 52.8% (47) [Table 2]. Fifteen participants (16.9%) had midline diastema.

	Respondents that like “gap teeth” (%)			Total	P
	Like (%)	Do not like (%)	Indifferent (%)		
Age (years)					
10-19	6 (85.7)	1 (14.3)	0	7	0.10
20-29	20 (39.2)	31 (60.8)	0	51	
30-39	6 (27.3)	15 (68.2)	1 (4.6)	22	
40-49	5 (55.6)	4 (44.4)	0	9	
Total	37	51	1	89	
Gender					
Female	22 (50)	22 (50)	0	44	0.19
Male	15 (33.3)	29 (64.4)	1 (2.2)	45	
Total	37	51	1	89	
Ethnic group					
Hausa	0	1 (100)	0	1 (100)	0.79
Ibo	7 (35)	13 (65)	0	20	
Yoruba	30 (44.1)	37 (54.4)	1 (1.5)	68	
Total	37	51	1	89	
Group					
Medically inclined	10 (23.8)	31 (73.8)	1 (2.4)	42	0.001
Nonmedically inclined	27 (57.5)	20 (42.6)	0	47	
Total	37	51	1	89	

	Frequency (%)
Age (years)	
10-19	7 (7.9)
20-29	51 (57.3)
30-39	22 (24.7)
40-49	9 (10.1)
Total	89 (100.0)
Gender	
Female	44 (49.4)
Male	45 (50.6)
Total	89 (100.0)
Occupation	
Dental oriented	42 (47.2)
Non dental oriented	47 (52.8)
Total	89 (100.0)
Ethnic group	
Hausa	1 (1.1)
Ibo	20 (22.5)
Yoruba	68 (76.4)
Total	89 (100.0)

Mean age=27.9 years, SD =±0.79. SD: Standard deviation

The proportions of participants that liked maxillary midline diastema were 41.6% (37) [Table 3].

About 42% of the participants rated their smile as attractive, whereas the proportion of those satisfied with their smile were 37.1% [Table 4].

Seventy-one percent of the dentally inclined participants rated 2 mm maxillary midline diastema as attractive compared to 68% of the nonmedically inclined group although this was not statistically significant ($P = 0.91$). About 52% of the medically inclined and 49% of nonmedically inclined participants rated maxillary midline diastema of 4 mm as acceptable while 48.9%.

The difference in their rating was found to be statistically significant ($P = 0.02$). At 6 mm width, there was a general rating of unattractiveness with 83.3% medically inclined and 66% nonmedically inclined participants rating it unattractive. However, there was a significant difference between their ratings [$P = 0.03$, Table 5].

Table 1 shows that a higher percent (73.8%) of the medically inclined participants did not like midline diastema.

DISCUSSION

In this study, a lower prevalence of maxillary midline diastema was seen. The proportion of those with midline diastema was lower than previous studies.^[17,18] The prevalence in previous studies was 21.6%^[17] and 34%, respectively. The studies were done in the southwestern part of Nigeria^[17] and Tanzania.^[18] A higher prevalence of midline diastema in the Nigerian population has been noted compared to a low prevalence in Caucasians.^[3,19,20] The reason for the findings in this study might be due to a lower population seen or the target group selected which were professionals either medically oriented or not. It might also be the varying method of data collection used in previous studies and this study. The previous studies were conducted with questionnaire with no set of digital photographs though all studies used questionnaire and confirmed the presence of midline diastema. Despite the fact that a lower proportion of incidence of maxillary midline diastema was seen, less than half percent still rated their smile attractiveness as

attractive, and those that were satisfied with their smile were less than half of the population. This suggests that other factors contribute to smile attractiveness and satisfaction of smile. There have been studies previously done to demonstrate that various factors help

to determine attractiveness and satisfaction of smile such as shade,^[5] gingival margin height of maxillary height of a maxillary central,^[21] gingival exposure,^[22] gingival exposure of lower teeth,^[23] and smile line.^[24]

Table 3: Participants responses to presence or absence of diastema

	Frequency (%)
Respondents that like gap teeth	
Like gap teeth	37 (41.6)
Don't like gap teeth	51 (57.3)
Indifferent	1 (1.1)
Respondents that have gap teeth	
Have	15 (16.9)
Don't have	74 (83.1)
Total	89 (100)
Respondents that don't have but would like to have "gap" teeth	
Would like to have	7 (9.5)
Don't want to have	67 (90.5)
Total	74 (100.0)

Table 4: Rating of smile satisfaction and attractiveness

	Frequency (%)
Rating of smile satisfaction	
Attractive	37 (41.6)
Acceptable	45 (50.6)
Unattractive	7 (7.9)
Rate of smile attractiveness	
Attractive	33 (37.1)
Acceptable	51 (57.3)
Unattractive	5 (5.6)
Total	89 (100)

Maxillary midline width of 2 mm was rated by most of the participants as attractive. This was similar to earlier study,^[5] but a contrast to the previous study which state that midline diastema of <1 mm is acceptable to patients.^[8,2] Our result further buttresses the fact that midline diastema is perceived as a symbol of beauty in our environment.^[9,16,25] The acceptable width of midline diastema in this study was 4 mm. Increase in the width resulted in a rating of unattractiveness. Maxillary midline width of 6 mm resulted in no proportion of medically inclined participants rating attractiveness.

About three-quarter of the medically inclined participants did not like diastema whereas over half of the population of nondentally inclined participants liked diastema. Despite the African cultural perception of midline diastema as a symbol of beauty, the dentally oriented participant did not perceive midline diastema as such. This suggests that dental knowledge that is training based on textbook and norms from Western societies influences the cultural norms of perception of maxillary midline diastema. This implies that an acquisition of western norms or culture has occurred among the medically oriented participants resulting in varied views between the dentally oriented and

Table 5: Grading of attractiveness of midline diastema width according to the participant's group

Group	Attractiveness of smile			Total	P
	Attractive	Acceptable	Unattractive		
2 mm diastema					
Dental oriented	30 (71.4)	10 (23.8)	2 (4.8)	42 (100)	0.91
Not dentally oriented	32 (68.1)	13 (27.7)	2 (4.2)	47 (100)	
Total	62 (69.7)	23 (25.8)	4 (4.5)	89 (100)	
3 mm diastema					
Dental oriented	19 (45.2)	21 (50.0)	2 (4.8)	42 (100)	0.38
Not dentally oriented	26 (55.3)	17 (36.2)	4 (8.5)	47 (100)	
Total	45 (50.6)	38 (36.2)	6 (6.7)	89 (100)	
4 mm diastema					
Dental oriented	6 (14.3)	22 (52.4)	14 (33.3)	42 (100)	0.02**
Not dentally oriented	17 (36.2)	23 (48.9)	7 (14.9)	47 (100)	
Total	23 (25.8)	45 (50.6)	21 (23.6)	89 (100)	
5 mm diastema					
Dental oriented	2 (4.8)	16 (38.1)	24 (57.1)	42 (100)	0.08
Not dentally oriented	9 (19.2)	19 (40.4)	19 (40.4)	47 (100)	
Total	11 (2.4)	35 (39.3)	43 (48.3)	89 (100)	
6 mm diastema					
Dental oriented	0 (0.0)	7 (16.7)	35 (83.3)	42 (100)	0.03**
Not dentally oriented	6 (12.8)	10 (21.2)	31 (66.0)	47 (100)	
Total	6 (6.7)	17 (19.1)	66 (74.2)	89 (100)	

**Means area of statistical significance ($P < 0.05$)

nondentally oriented participants. This is reflected in the varied perception of midline diastema. This finding also supports the findings in Saudi which noted that those with dental exposure significantly identified the ideal smile better than laypersons.^[21] However, a previous study^[26] found that dentists and laypeople did not rate a midline diastema as unattractive until the distance between the contacts of the central incisors was 2.0 mm. These previous studies^[2,27] were not done among Africans. Perception is, therefore, an aspect of human behavior than can be influenced by varying factors.^[27] In this study, the perception was influenced by dental exposure/education.

CONCLUSION

This study was able to demonstrate that dental knowledge/exposure influenced the perception of maxillary midline diastema as a symbol of beauty. The acceptable width of the midline diastema in this study is 2–4 mm. It is recommended that, in managing patient, particularly those of African origin, dental knowledge and exposure should be put into consideration during treatment planning.

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Conflicts of interest

There are no conflicts of interest.

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