

Influence of Socio-demographic Factors on Perception of Midline Diastema

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Abstract

Objective: Socio-demographic factors have been said to affect the perception of midline diastema. Aesthetic importance of maxillary midline diastema varies in individuals and there is no common consensus on the registration of diameter of maxillary midline diastema. The aim of the study was therefore to determine the acceptable width of diastema among a group of Nigerian subjects and the effect of their socio-demographic factors on the perception of midline diastema.

Method: Subjects aged 19-45 yrs were recruited from the 6 geopolitical zone of Nigeria. A structured questionnaire was administered to participants. The questionnaire sought for information such as age, gender, profession, presence of midline diastema and created diastema. The questionnaire included a coloured smile photograph with digitally altered varying sizes of diastema (2mm - 6mm). Subject rated the different coloured photographs using the rating scale (very attractive = 1, attractive = 2, accepted = 3, unattractive = 4, and very unattractive = 5). Data were analyzed with the Statistical Package for Social Sciences (SPSS) version 16.0 (SPSS Inc, Chicago IL).

Result: A total of 374 participants aged 19 – 45 years was involved in this study. Majority (52.1%) were females and mean age was 37.07 +/- 0.63 years. Only 30.2% had midline diastema out of which 12% was artificially created. Majority (86.7%) of the created diastema was done by the dentist. Age ($p=0.024$) and level of education ($p=0.017$) had a significant relationship with perception of midline diastema. Older subjects and those with lower educational level considered midline diastema a sign of beauty. Majority of the participants perceived the 2-4mm midline diastema attractive and 5-7mm midline diastema unattractive.

Conclusion: It can be concluded from this study that a relationship exists between age and perception of midline diastema. The acceptable width of the midline diastema in this study is 2mm-4mm.

Key words: Socio-demographics, midline, diastema, anterior spacing.

Introduction

Aesthetic importance of maxillary anterior spacing varies both culturally and racially as well as with the incidence of diastemas with a given population⁽¹⁾. In Western society, diastema is not a favourable physical trait but in Africa it is⁽²⁾ complimentary. A small midline diastema may be considered as attractive by some group of people⁽³⁾. However, as the size of the gap increases, the level of comfort decreases to the point of creating a feeling of self consciousness. There has not been a common consensus on the registration of diameter of the maxillary midline diameter^(4,5,6,7).

In Africa, diastema is generally regarded as a symbol of beauty and those possessing diastema often enjoy a lot of compliments in the society⁽²⁾. Socio-demographic factors such as age, sex, socioeconomic status have been

suggested to affect perception of midline diastema⁽⁸⁾ but there is no conclusive report on its effects on the perception of midline diastema. In our extensive search there was no literature on the registration of the acceptable diameter for maxillary midline diastema and the effects of socio-demographic factors on the perception of midline diastema amongst Africans. Therefore, the aim of this study was to determine the acceptable width of midline diastema and the effect of age, sex and socio-economic status on the perception of midline diastema in a group of Africans.

Materials and method

This study was a cross sectional study done in Nigeria which consists of diverse ethnic and social African groups. A two stage sampling method was done to select participants between the age of 19 and 45 years, who had

no refractory eye defect problem and had no orthodontic treatment. Subjects were selected from the six geographical zones of the country. One state was selected randomly to represent each zone and a local government area (LGA) in the selected state was chosen randomly. Health facilities in the selected local government were selected randomly and attendees of this facility participated in the study. Willing participants who met the inclusion criteria and from whom informed consent was obtained participated in the study. Oral examination was done and individuals with pathological migration of teeth were excluded.

Structured questionnaires were administered to participants by three trained investigators. The questionnaire sought for information such as age, gender, and profession. The questionnaire included a set of coloured smile photographs obtained from an African female smile using a digital camera 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 2mm and widest at 6mm. The nose and the chin were not included in the photograph to reduce confounders. (Figure 1a - 1e)

FIGURE 1
Set of altered smile pictures used (Scale 1:2).

Figure 1a



2mm diastema

Figure 1b



3mm diastema

Figure 1c



4mm diastema

Figure 1d



5mm diastema

Figure 1e



6mm diastema

Subjects were required to rate the different coloured photographs using the rating scale (very attractive =1, attractive =2, accepted =3, unattractive =4, and very unattractive =5)⁽⁹⁾. The codes were later collapsed by combining codes 1/ 2, and codes 4/5 to give attractive, acceptable and unattractive. Subjects were called in individually to avoid conference response to questionnaire so as to reduce bias, Dental clinics and health outlets in local governments were used.

Subjects were classified into 3 socio-economic statuses⁽¹⁰⁾ as follows; Class 1- Skilled workers e.g. professionals and managerial officers and retirees of this cadre, Class 2- Unskilled workers e.g. Artisans and traders, Class 3- Dependants. e.g. Retirees of class 2, those not on pensions, house wives of class 2 cadre, students whose parents are unskilled workers.

Subjects were recruited and data collected in a period of three months (May-July 2014). Data were analyzed in August 2014 using SPSS 16 Statistical Software for Windows (version 16.0 SPSS Inc, Chicago IL). Questionnaires with missing variable were not included in the analysis. The results were presented in the forms of frequency table and cross tabulation. Chi square test was done to determine statistical significance. The statistical significance of outcomes was evaluated at 95% confidence level and significant association was determined if $p < 0.05$.

Results

The total number of the study participants was 374, aged between 19 and 45 years, the mean was 37.07 ± 0.63 years. There were females (52.1%) and 179(47.9%) males (Table 1). One hundred and thirteen participants (30.2%) had midline diastema. Out of the 113 participants who had midline diastema, 45 were not natural diastema (Table 1).

Majority (86.7%) of this created diastema was done by the dentist while Hairdressers created 13.3%.

Majority (65.6%) of age > 40 years perceived midline diastema as a sign of beauty ($P=0.02$). Also subjects with primary education were the highest proportion of those who perceived midline diastema as a sign of beauty ($P=0.017$). There was slight increase in the proportion of females who consider midline diastema a sign of beauty (59%) when compared with the males (53.1%). This was however not statistically significant ($p=0.28$) (Table 2).

The 2mm diastema was perceived as attractive by a greater proportion of both males (79.3%) and females (80.5%) as well as majority of participants in all the age groups with the highest proportion in age group 31-40 years (81.5%) ($P = 0.82$). Also, most of the subjects in all the socio-economic classes and educational levels graded the 2mm diastema as attractive (Table 3).

Majority of the participants still perceived 3mm diastema as attractive although the percentages reduced slightly. The 3mm diastema was perceived as attractive by 73.7% of males and 76.4% of females. The highest proportion that found it attractive was among the 21-30 years age group (80.5%) and primary level of education (84.8%) (Table 4).

The proportion of participants who considered the diastema attractive reduced further when grading the 4mm diastema. Only 44.2% males and 42.5% females perceived the 4mm diastema as attractive. The highest proportion who considered the 4mm diastema attractive was found among the age group >40 years (58.2%) ($p=0.001$), class 2 socio-economic class (59.6%) and among the participants with informal education (58.1%) ($p=0.04$) (Table 5).

Table 1: Demographic characteristics of subjects

| Characteristics | N (%) |
|--|--------------------|
| Age group (years) | |
| 21-30 | 41 (11.0) |
| 31-40 | 211 (56.4) |
| >40 | 122 (32.6) |
| Sex | |
| Male | 179 (47.9) |
| Female | 195 (52.1) |
| Socio-economic class | |
| Class I | 139 (37.2) |
| Class II | 47 (12.6) |
| Class III | 188 (50.2) |
| Education | |
| Informal | 31 (8.3) |
| Primary | 46 (12.3) |
| Secondary | 18 (4.8) |
| Tertiary | 279 (74.6) |
| Presence of midline diastema | |
| Yes | 113 (30.2) |
| No | 261 (69.8) |
| Type of midline diastema | |
| Natural diastema | 68 (88.0) |
| Artificial diastema | 45 (12.0) |
| Creation of artificial diastema | |
| Filing by hairdresser | 6 (13.3) |
| Done by dentist | 39 (86.7) |
| Total | 374 (100.0) |

Table 2

Influence of age, sex, education, socioeconomic class of respondents on perception of maxillary midline diastema as a sign of beauty

Perception of midline diastema

| | Yes N(%) | No N(%) | Total N(%) | Chi square | P Value |
|----------------------------|-----------|-----------|------------|------------|---------|
| Age (yrs) | | | | | |
| 21-30 | 24(58.5) | 17(41.5) | 41(100.0) | 7.49 | 0.024 |
| 31-40 | 106(50.2) | 105(49.8) | 211(100.0) | | |
| >40 | 80(65.6) | 42(34.4) | 122(100.0) | | |
| Gender | | | | | |
| Male | 95(53.1) | 84(46.9) | 179(100.0) | 1.19 | 0.280 |
| Female | 115(59.0) | 80(41.0) | 195(100.0) | | |
| Education | | | | | |
| Informal | 14(45.2) | 17(54.8) | 31(100.0) | 10.16 | 0.017 |
| Primary | 34(73.9) | 12(26.1) | 46(100.0) | | |
| Secondary | 13(72.2) | 5(27.8) | 18(100.0) | | |
| Tertiary | 149(53.4) | 130(46.6) | 279(100.0) | | |
| Socioeconomic Class | | | | | |
| Class I | 83(59.7) | 56(40.3) | 139(100.0) | 5.85 | 0.054 |
| Class II | 32(68.1) | 15(31.9) | 47(100.0) | | |
| Class III | 95(50.5) | 93(49.5) | 188(100.0) | | |

Table 3: Respondents' grading of smile with 2mm midline diastema.

| | Attractive N (%) | Acceptable N (%) | Unattractive N (%) | Total N (%) | X ² | P value |
|------------------------------|---------------------|---------------------|-----------------------|----------------|----------------|---------|
| Sex | | | | | | |
| Male | 142 (79.3) | 33 (17.9) | 4 (2.8) | 179 (100.0) | 1.5 | 0.470 |
| Female | 155 (80.5) | 33 (15.9) | 7 (3.6) | 195 (100.0) | | |
| Age (years) | | | | | | |
| 21 -30 | 30 (73.1) | 8 (19.5) | 3 (7.3) | 41 (100.0) | 2.92 | 0.820 |
| 31 -40 | 172 (81.5) | 35 (16.6) | 4 (1.9) | 211 (100.0) | | |
| >40 | 95 (77.5) | 23 (18.9) | 4 (3.3) | 122 (100.0) | | |
| Socio -economic class | | | | | | |
| Class I | 107 (76.9) | 27 (19.4) | 5 (3.6) | 139 (100.0) | 3.04 | 0.550 |
| Class II | 35 (74.5) | 9 (19.1) | 3 (6.4) | 47 (100.0) | | |
| Class III | 155 (81.5) | 30 (16.0) | | 188 (100.0) | | |

| Education | Attractive | Acceptable | Unattractive | Total | X ² | P value |
|-----------|------------|------------|--------------|-------------|----------------|---------|
| | N (%) | N (%) | N (%) | N (%) | | |
| Informal | 24 (77.4) | 5 (16.1) | 2(6.5) | 31 (100.0) | 5.247 | 0.510 |
| Primary | 39 (84.8) | 5 (10.9) | 2(4.3) | 46 (100.0) | | |
| Secondary | 13 (72.2) | 4 (22.2) | 1(5.6) | 18 (100.0) | | |
| Tertiary | 224 (80.3) | 50 (17.9) | 5(1.8) | 279 (100.0) | | |

Table 4: Respondents' grading of smile with 3mm midline diastema.

| Sex | Attractive | Acceptable | Unattractive | Total | X ² | P value |
|-----------------------------|------------|------------|--------------|-------------|----------------|---------|
| | N (%) | N (%) | N (%) | N (%) | | |
| Male | 132 (73.7) | 39 (21.8) | 8 (4.5) | 179 (100.0) | 0.32 | 0.850 |
| Female | 149 (76.4) | 38 (19.5) | 8 (4.1) | 195 (100.0) | | |
| Age (years) | | | | | | |
| 21 -30 | 46 (80.5) | 5 (12.2) | 3 (7.3) | 41 (100.0) | 3.67 | 0.450 |
| 31 -40 | 156 (73.9) | 47 (22.3) | 8 (3.7) | 211 (100.0) | | |
| >40 | 95 (77.5) | 23 (18.9) | 4 (3.3) | 122 (100.0) | | |
| Socio-economic class | | | | | | |
| Class I | 103 (74.1) | 32 (23.0) | 4 (2.9) | 139 (100.0) | 2.92 | 0.570 |
| Class II | 15 (78.7) | 6 (12.8) | 3 (8.5) | 47 (100.0) | | |
| Class III | 141 (75.0) | 38 (20.2) | 10 (4.8) | 188 (100.0) | | |
| Education | | | | | | |
| Informal | 22 (71.0) | 5 (16.1) | 4 (12.9) | 31 (100.0) | 13.20 | 0.040 |
| Primary | 39 (84.8) | 4 (8.7) | 3(6.5) | 46 (100.0) | | |
| Secondary | 15 (83.3) | 3 (16.7) | 0 (0) | 18 (100.0) | | |
| Tertiary | 209 (74.9) | 62 (22.2) | 8 (2.9) | 279 (100.0) | | |

Table 5: Respondents' grading of smile with 4mm midline diastema.

| Sex | Attractive | Acceptable | Unattractive | Total | X ² | P value |
|-----------------------------|------------|------------|--------------|-------------|----------------|---------|
| | N (%) | N (%) | N (%) | N (%) | | |
| Male | 79 (44.2) | 78 (43.6) | 22 (12.3) | 179 (100.0) | 0.11 | 0.990 |
| Female | 83 (42.5) | 80 (41.0) | 32 (16.5) | 195 (100.0) | | |
| Age (years) | | | | | | |
| 21 -30 | 21 (51.2) | 13 (31.7) | 7 (17.1) | 41 (100.0) | 25.75 | 0.001* |
| 31 -40 | 70 (22.3) | 103 (48.8) | 38 (18.0) | 211 (100.0) | | |
| >40 | 71 (58.2) | 42 (34.4) | 9 (7.4) | 122 (100.0) | | |
| Socio-economic class | | | | | | |
| Class I | 61 (43.9) | 60 (43.2) | 18 (12.9) | 139 (100.0) | 7.34 | 0.120 |
| Class II | 28 (59.6) | 13 (27.7) | 6 (12.7) | 47 (100.0) | | |
| Class III | 73 (38.8) | 85 (45.2) | 27 (16.0) | 188 (100.0) | | |
| Education | | | | | | |
| Informal | 18 (58.1) | 10 (32.3) | 3 (9.7) | 31 (100.0) | 13.20 | 0.040 |
| Primary | 26 (56.5) | 12 (26.1) | 8 (17.4) | 46 (100.0) | | |
| Secondary | 11 (61.1) | 5 (27.8) | 2 (11.1) | 18 (100.0) | | |
| Tertiary | 100 (35.8) | 140 (50.2) | 39 (14.0) | 279 (100.0) | | |

The 5mm diastema was perceived as unattractive by more of the participants (i.e. 45.3% males and 52.6% females. Majority in all the age groups found 5mm diastema unattractive and the highest proportion was found among the 31-40 years age group (56.9%) (p=0.001) (**Table 6**).

The 6mm diastema was perceived as unattractive by a greater proportion of both males (57.5%) and females (70.3%). A greater percentage of participant in all the age groups (p=0.001) as well as participants with tertiary level of education (p=0.007) also perceived the 6mm diastema as unattractive (**Table 7**).

Table 6: Respondents' grading of smile with 5mm midline diastema.

| Sex | Attractive N (%) | Acceptable N (%) | Unattractive N (%) | Total N (%) | X ² | P value |
|-----------------------------|---------------------|---------------------|-----------------------|----------------|----------------|---------|
| Male | 34 (19.0) | 64 (35.8) | 81 (45.3) | 179 (100.0) | 3.66 | 0.160 |
| Female | 33 (16.9) | 60 (30.8) | 102 (52.6) | 195 (100.0) | | |
| Age (years) | | | | | | |
| 21-30 | 7 (17.1) | 14 (34.1) | 21 (51.3) | 41 (100.0) | 25.75 | 0.001* |
| 31-40 | 24 (11.4) | 67 (31.8) | 120 (56.9) | 211 (100.0) | | |
| >40 | 36 (29.5) | 43 (35.2) | 43 (35.3) | 122 (100.0) | | |
| Socio-economic class | | | | | | |
| Class I | 23 (16.6) | 50(36.0) | 66(47.5) | 139 (100.0) | 7.34 | 0.120 |
| Class II | 12(25.5) | 19(40.4) | 16(34.1) | 47(100.0) | | |
| Class III | 32 (17.0) | 55 (29.3) | 101 (53.7) | 188 (100.0) | | |
| Education | | | | | | |
| Informal | 8 (25.8) | 13 (50.0) | 10 (32.3) | 31 (100.0) | 16.00 | 0.010 |
| Primary | 13 (28.3) | 13 (28.3) | 20 (43.5) | 46 (100.0) | | |
| Secondary | 5 (27.8) | 9 (50.0) | 4 (22.2) | 18 (100.0) | | |
| Tertiary | 36 (12.9) | 100 (35.8) | 143 (35.8) | 279 (100.0) | | |

Table 7: Respondents' grading of smile with 6mm midline diastema.

| Sex | Attractive N (%) | Acceptable N (%) | Unattractive N (%) | Total N (%) | X ² | P value |
|-----------------------------|---------------------|---------------------|-----------------------|----------------|----------------|---------|
| Male | 32 (17.8) | 44 (24.5) | 103 (57.5) | 179 (100.0) | 4.88 | 0.09 |
| Female | 23 (11.8) | 35 (17.9) | 137 (70.3) | 195 (100.0) | | |
| Age (years) | | | | | | |
| 21-30 | 5 (12.2) | 3 (7.3) | 33 (80.5) | 41 (100.0) | 23.29 | 0.001* |
| 31-40 | 20 (9.4) | 45 (21.3) | 146 (69.2) | 211 (100.0) | | |
| >40 | 28 (23.0) | 33 (27.0) | 61 (50.0) | 122 (100.0) | | |
| Socio-economic class | | | | | | |
| Class I | 16 (11.5) | 34 (24.5) | 89 (64.0) | 139 (100.0) | 7.82 | 0.098 |
| Class II | 9(19.1) | 13 (27.7) | 25 (53.2) | 47 (100.0) | | |
| Class III | 27 (14.4) | 32 (17.0) | 129 (68.6) | 188 (100.0) | | |
| Education | | | | | | |
| Informal | 8 (25.8) | 8 (25.8) | 15 (48.4) | 31 (100.0) | 17.66 | 0.007 |
| Primary | 12 (26.1) | 6 (13.0) | 28 (60.9) | 46 (100.0) | | |
| Secondary | 3 (16.7) | 5 (27.8) | 10 (55.5) | 18 (100.0) | | |
| Tertiary | 26 (9.3) | 58 (20.8) | 195 (69.9) | 279 (100.0) | | |

Discussion

In this study the older age group perceived midline diastema as a symbol of beauty more than the younger age group. Aesthetic perception has been said to vary from person to person and is influenced by personal experience and social environment⁽¹¹⁾. Older persons have more personal experience and are likely to be more affected by their social environment and this may explain the pattern noticed in this study.

Females are generally more concerned about their appearance than males. In this study, there was a slight difference in the perception of midline diastema among the males and females with the females preferring diastema to the males. This difference was however not statistically significant. This finding is in contrast with that of another study done in Baghdad, which noted a higher male preference for midline diastema⁽¹²⁾.

This study revealed that subjects with primary and secondary levels of education perceived midline diastema as attractive more than others with the higher educational level. Subjects with higher educational background tend not to perceive midline diastema as attractive. The reason for this finding is that subjects with higher educational background are more informed and they are more exposed to sources of information, which gives more informative view and perception⁽¹³⁾.

There is a varied pattern in the prevalence of midline diastema in the country^(14,15). The high prevalence of midline diastema compared to the Caucasians have been reported in early studies^(2,16,17,18). Artificial diastema was reported by 39.8% in this study and they were reported to be created by a dentist in 86.7% of cases. This suggested that potentially harmful and unprofessional dental practice is still common in our environment. An earlier study done among Southwestern Nigerians reported a significant desire for artificial diastema among the studied group⁽¹⁴⁾. Another study reported that many Nigerian dentists(84.9%) have been consulted to artificially create a diastema but only 2.2% agreed to the request⁽¹⁹⁾. Complications from poorly executed teeth modification as a result of artificially created diastema have been reported^(15,19). It is therefore necessary to discourage such a practice.

In this study, majority of the respondents rated the diastema attractive when the diameter was between 2mm and 3mm. Further increment in diameter resulted in a decrease in its appeal to respondents. A previous study⁽¹⁴⁾ stated that majority (72.8%) of Southwestern Nigerian respondents viewed diastema as a sign of beauty, however respondents tend not to appreciate a gap greater than 4mm in diameter and this was statistically related to age and education. An earlier study done among Jordanian revealed that midline diastema was rated as unattractive⁽²⁰⁾. A previous study done among orthodontists, general practitioners and lay persons suggested that orthodontists

rated the smile as unattractive when the midline diastema width was 1–1.5 mm or more, while general practitioners and laypeople considered the smile as unattractive when the midline diastema width was 2 mm or more⁽²¹⁾. This is a contrast to the findings in our study, that had a population consisting mostly of students (40.7%) and skilled workers (37.7%). Most of these subjects in this study still rated midline diastema width up to 3mm as attractive and 4mm as acceptable. Majority of subjects considered the midline width greater than 4mm as unattractive. Although, the subjects in this study considered midline diastema as a sign of beauty, a diastema greater than 4mm was generally not considered as an asset of beauty. The earlier studies⁽²¹⁻²⁴⁾ did not determine the relationship between age, sex, socioeconomic and aesthetic rating of smile with increased width of midline diastema. These studies were done in Jordan, America, Europe and Japan respectively.

From the findings in the study, as the width of diastema increased from 2mm to 4mm, age group > 40 years had the highest proportion of subjects perceiving midline diastema as attractive. An increase in diastema width above 4mm resulted in general diminution in appeal with age group > 40 years still having the greater proportion of subjects regarding the diastema at that width as attractive. This suggests that the older age group perceive midline diastema more attractive than other age groups. This finding further accentuates the fact that perception of midline diastema varies with age⁽²¹⁾. The findings of this study however revealed no significant relationship between sex as well as socioeconomic status and perception of midline diastema.

The limitation of this study was that of funding. The use of overhead projectors for subjects would have helped to remove all bias or imprecision that would have occurred in using questionnaires.

Conclusion

It can be concluded from this study that a relationship exists between age and perception of midline diastema. Level of education and socioeconomic status have no significant influence on perception of midline diastema. The acceptable width of the midline diastema in this study is 2mm-4mm.

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