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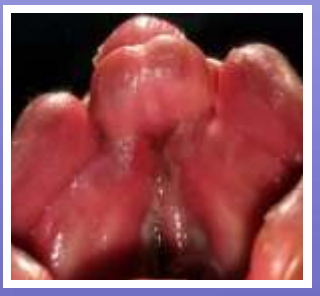

Maxillary midline diastema in Africa: Scoping review

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Prevalence and Perception of Maxillary Midline Diastema in Africa: A Scoping Review

Yemitan TA[a,b], Odunsi OY[b], Ayebameru OE[b], Adigun AF[b], Isaac AE[b]

Abstract

Background: Maxillary Midline Diastema (MMD) is a distinctive space or gap between the maxillary central incisors. It is also called "open teeth" or "gapped teeth. True midline diastema has been defined as the one without periodontal/periapical involvement and with the presence of all anterior teeth in the arch. It is most commonly applied to an open space between the upper incisors, that is, maxillary midline diastema being the most common of all the various types. Different people have different perceptions of MMD. The objective of the study was to synthesize the prevalence and perception of MMD in Africa.

Method: The authors conducted a review that included literature searches of four databases through March 2022: PubMed, Google Scholar, PMC, ResearchGate, and Cochrane library electronic databases on the prevalence and perception of MMD in Africa.

Results: In all, 32 articles were identified, 19 of these were considered for review and 13 met the eligibility criteria. The results showed MMD to be prevalent in Africa and found to be more in females than in males.

Conclusion: MMD is not uncommon in Africans and is perceived as a beauty sign among Nigerians and some African populations.

Keywords: Maxillary Midline Diastema, Prevalence, Perception, Africa, Scoping review.

ORIGINAL ARTICLE

Authors' Affiliation

[a] Department of Child Dental Health
Lagos State University College of Medicine, Ikeja, Lagos
[b] Department of Child Dental Health,
Lagos State University Teaching Hospital, Ikeja, Lagos

Correspondence:

Dr T.A. Yemitan, Department of Child Dental Health, Lagos State University College of Medicine, Ikeja, Lagos, Nigeria.
Phone: +2348034103770
email:laranig@yahoo.com

Introduction

Maxillary Midline Diastema (MMD) is a distinctive space or gap between the maxillary central incisors. It is also called "open teeth" or "gapped teeth".[1,2,3] Maxillary Midline Diastema (MMD) is defined as a space greater than 0.5 mm between the proximal surfaces of two adjacent central incisors. True midline diastema has been defined as the one without periodontal/periapical involvement and with the presence of all anterior teeth in the arch. It is most commonly applied to an open space between the upper incisors, making maxillary midline diastema the most common of all the various types.[4,5]

People's interest in the perception of the beauty of their teeth came to inception 2000 years ago, and ever since, attention has been placed on an individual's mouth and eyes when speaking in social environments.[5,6] The need for treatment of MMD is primarily due to psychological and aesthetic needs and not for functionality purposes.[5] MMD, a continuous space or gap between the maxillary central incisors, can be a normal growth feature which is characteristic of the primary and mixed dentition with the space closing normally by the time the maxillary canines are erupted. There are no exact rules governing what constitutes a beautiful occlusion of social acceptance. Also, the aesthetic

importance of maxillary anterior spacing varies both culturally and racially, therefore, the prevalence of MMD within a given population varies.

A naturally-occurring midline diastema may result from a wide range of aetiology including physiological, genetic, abnormal labial frenum, ectopic maxillary canines, dental alveolar disproportion, a missing tooth, peg-shaped lateral, proclination of the upper labial segment, unerupted midline supernumerary teeth, prominent frenum, tooth size or shape discrepancy, and mesiodistal angulations of incisors .[5,7-9]

Previous research reported varying responses regarding the perception of midline diastema, however, a reported increased frequency of maxillary midline diastema in Caucasian female models was considered an increase in acceptance of the maxillary midline diastema.[5] It was noted that the width of the diastema tends to affect its aesthetic acceptability.[2,5,8,10] Although MMD is appraised and seen as a sign of beauty among some African populations, there is a need to synthesize the perception and prevalence of MMD among the different populations in the continent of Africa. The objective of this review is, therefore, to highlight the prevalence and the perception of Maxillary Midline Diastema in Africa.

Materials and methods

The authors conducted a review that included literature searches of databases through March 2022 including PubMed, PMC, ResearchGate, Google Scholar and Cochrane library electronic databases. The articles included were focused on the prevalence and perception of MMD in Africa. Information not relevant to the scope of the study was not included.

Results

In all, 32 articles were identified, of which 19 were considered for review and those that did prevalence studies and or perception of maxillary midline diastema were included in the review.

Thirteen articles met the eligibility criteria, out of which results of prevalence and perception of Maxillary Midline Diastema were synthesized.

Table 1. Sources of Literature and Information included in this Review

Serial No	Author	Country	Title	Type of Study	Sample size (N)	Prevalence
1. 2. 3.	Omotosho G. et al.[11] (2009)	Nigeria	Midline Diastema amongst South-Western Nigerians.	Retrospective and Transcultural study	N=589	26.1%
4. 5. 6. 7.	Umanah et al.[8] (2015)	Nigeria	Prevalence of artificially created maxillary midline diastema and its complications in a selected Nigerian population.	Cross-sectional	N=141	28.4 %
8. 9. 10. 11. 12. 13.	Enabulele J.E.etal.[5] (2018)	Nigeria	Socio-cultural beliefs Regarding Midline Diastema among undergraduate students attending A Nigerian university.	Descriptive cross-sectional	N=400	29%
	Akinboboye O.B. et al.[12] (2018)	Nigeria	Perception of midline diastema in dental- and nondental-oriented individuals.	Analytic cross-sectional study	N=89	16.9%

Enabulele J.E. et al.[13] (2020)	Nigeria	How Attractive is the Maxillary Midline Diastema? Perception of Undergraduate Students Attending a Nigerian University	Cross-sectional	N= 333	34.8%
Rashid A.[1] (2021)	Egypt	Maxillary midline diastema among a group of Egyptian adult populations (prevalence and *aetiology*).	Cross-sectional study	N=375	17.3%
Aikins E.[18](2014)	Nigeria	Subjective Opinions of Dental Attractiveness and Orthodontic Treatment Need among Nigerian Adolescents.	Cross-Sectional study	N= 612	
Abdullah M. et al.[3] (2016)	Egypt	Revisiting the factors underlying Maxillary Midline Diastema.	Scientific study	N=100	13.6%
Ize Iyamu et al.[19] (2016)	Nigeria	Maxillary Midline Diastema in Nigerians: Beauty or Malocclusion.	Scientific Study	N= 203	
Mabiaku et al.[14] (2017)	Nigeria	Prevalence and Perception of Midline Diastema among Students of Institute of Health Information Management, University of Benin Teaching Hospital (UBTH), Benin City, Edo State, Nigeria	Descriptive cross-sectional study	N=100	28%
Athumani et al.[15] (2006)	Tanzania	Perception on diastema medialle (mwanya) among dental patients attending Muhimbili National Hospital.	Cross-sectional	N= 200	26%
Temisanren et al.[16] (2019)	Nigeria	Acceptability of midline diastema among dental technician students at the university college hospital, Ibadan.	Cross-sectional	N= 164	23.9%
Elfadel et al.[17] (2016)	Sudan	Prevalence and *aetiology* of midline diastema among Sudanese University students.	Cross-sectional	N=2200	7%

Prevalence of MMD

According to a study carried out by Omotosho *et al*[11] in 2009 where a total of 589 questionnaires were administered at random to 271 female and 318 male students of the University of Ilorin, Nigeria to determine the incidence and heredity of midline diastema amongst the Yoruba-speaking southwest Nigerians, the incidence of diastema was found to be 26.1%.

The report is similar to the observations from the descriptive and cross-sectional study by Enabulele *et al*[5], carried out among undergraduate students, at the University of Benin, Nigeria, to evaluate the prevalence and their sociocultural beliefs regarding MMD. They reported that, of the 400 students aged 16-46 years old, 29% of them had MMD. Later, another cross-sectional study of 333 undergraduate students of the sample population aged 16-30 years was done where data on socio-demographics, presence of midline diastema, self-assessment of the attractiveness of their smile and grading of a set of pictures with varying sizes of maxillary midline diastema (MMD) was analyzed and reported a prevalence of midline diastema of 34.8%.[13] The difference may be because of the sampling method and the smaller sample size.

Akinboboye *et al*[12] from their study comprised of diverse ethnic and social Nigerian groups, using a two-stage sampling method to select participants aged 20 to 49 years from the University of Lagos and the Lagos University Teaching Hospital, Lagos, Nigeria, found the prevalence of midline diastema to be 16.9%.

Mabiaku *et al*[14] reported a prevalence of 28% from their descriptive cross-sectional study on 100 undergraduates in Benin, Southern Nigeria, while Umanah *et al*[8] reported a prevalence of 28.4% from their crossectional study among patients attending a private dental clinic in Owerri, southern Nigeria.

Similarly, Athumani *et al*[15] reported a prevalence of 28% from their cross-sectional study of 200 adult patients aged 18 years and above attending the dental clinic in Muhimbili National Hospital, Tanzania. Temisanre *et al*[16] reported a prevalence of 23.9% from their cross-sectional study on 164 dental technician students at the University College Hospital, Ibadan, Southwestern Nigeria.

However, Elfadel *et al*[17] reported a prevalence of 7% from their descriptive cross-sectional study on 2200 Sudanese University students.

Adel Rashid *et al*[1], from their study to ascertain the prevalence and etiological factors responsible for maxillary midline diastema among a sample of Egyptian adult patients undergoing orthodontic treatment in orthodontic private clinics, using intraoral photography and radiographs, found that 17.3% of the studied patients had MMD, with no significant difference between the prevalence of MMD in both sexes (P = 0.079).

According to Umanah *et al*[8] on the prevalence of artificially created maxillary midline diastema (MMD) and its complications in a selected Nigerian population, the prevalence of artificially created MMD was 34.0%.

Gender distribution of MMD

Omotosho *et al*[11] reported significant differences in gender distribution of MMD, the prevalence was found to be higher in females (33.9%) than males (19.5%), P value <0.05. Similarly, Mabiaku *et al*[14] reported from their study that MMD was higher in females (85.7%) than males. Furthermore, they reported that MMD was perceived to be more appealing to sight in females (50.6%) than in males (4.1%).[11] It was also observed that the majority of respondents (75.4%) attached some aesthetic significance to diastema, while 29.7% signified interest in artificial diastema.[11]

It was also reported that there were differences in the occurrence of diastema among various population groups, with close to two-thirds (64.9%) of the cases of diastema being inherited, with a higher likelihood in the males.[11]

Aetiology of MMD

Abdullah *et al*[3] analysed the aetiological factors underlying the presence of maxillary midline diastema in a sample of orthodontic patients and suggested that diastema is a multifactorial clinical finding, with more than one predisposing aetiological reason. They recorded that there was an interrelationship between the familial pattern of midline diastema and microdontia, macroglossia, labial frenum, and alveolar cleft conform. [3] They however found that the effect of mesiodens and the upper lateral incisor (whether bilaterally missing, unerupted, or peg-shaped) was minimal. [3] This is contrary to findings by Adel Rashid[1] who recorded that the most common aetiological factors were congenitally missed laterals, highly attached frenum, generalized spaces, and flared incisors.

Perception of MMD

A cross-sectional study on 612 randomly selected Nigerian adolescents from secondary schools to assess their opinions of dental aesthetics[18] revealed that the majority (78.1%) of the population expressed satisfaction with the arrangement of their teeth, and their perception of orthodontic treatment needs increased, as their satisfaction with the arrangement of their teeth decreased.

MMD was regarded as a sign of beauty and perceived to be an aesthetic attribute in females.[5] According to a study by Umanah *et al*[8], a majority (69.5%) of their respondents desired MMD and 20.8% of those without it wanted it artificially created through cosmetic dentistry. Reasons for artificial MMD include enhancement of personal beauty and aesthetics. Another study reported that 13.3% of their respondents believed that diastemas should be created artificially.[19] The artificially created maxillary midline diastema (MMD) was significantly more common in females (44.8%).[8] Enhancement of personal beauty and aesthetics was the major reason given by respondents for having it done,[8] while the commonest complication reported was tooth sensitivity.[8] While a study by Akinboboye *et al*. [12] concluded that their respondents perceived MMD to be an aesthetic trait provided that the width is within 2 to 3mm width, another study[19] found that the diastema width between 1- 6mm was regarded as a sign of beauty, but larger diastemas between 7-8mm were rated as unattractive and should be closed. Therefore, the less the width of the diastema the more acceptable it becomes.[18]

Limitation

The results from the synthesis of this study were limited to Nigeria and some parts of Africa rather than a substantial population from other African countries. It is recommended that further studies should be carried out on a sample population from other African countries.

Conclusion

Maxillary Midline Diastema (MMD) is not uncommon and has been found to be prevalent in Nigeria and some parts of the African population. MMD occurs more in females than males and is perceived as a beauty sign.

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Manuscripts should meet the following criteria: original material, clear writing, appropriate study methods, valid data, and reasonable conclusions supported by the data, in short, they should contain important information on topic of general orthodontic interest.

Peer-review Process

All the manuscripts that adhere to its style and Instructions for Authors are referred to peer-review. Some of them are rejected immediately after an inhouse review. The rejection at this stage is due to insufficient originality, serious scientific flaws or absence of message. The remaining articles are sent to at least two reviewers who are. experts in the subject. Manuscripts are reviewed with due respect for authors' confidentiality, and the identity of peer reviewers is also kept confidential. A decision is made from 6 to 12 weeks according to the response from reviewers, revision by the author(s) and reappraisal on the revision.

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- Three copies of the manuscript should be submitted.
- Use 1 side of standard size 21.6x27.9 cm A4, white bond paper, with margins of at least 2.5 cm on each side.
- Double-space throughout including title page, abstract, text, acknowledgements, references, tables and figure legends. Start each of these sections (in same order) on a new page, numbered consecutively in the upper right hand corner, beginning with the title page.
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- Use nonproprietary names of material rugs, devices and other products.
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- acknowledgements, as per standard format (Appendix J)[23 1 Those sending their manuscript through email are also required to submit this form by post with original signatures.

Manuscripts not fulfilling the technical requirements shall be returned to the authors without initiating the peer-review process.

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The page should contain (i) the title of the article: which should be concise but informative (simpler the title the better; preferably it should contain all the key words to help electronic retrieval reliably); (ii) a short running title of less than 40 characters placed at the foot end of the title page; (iii) initials and surname of each author with the highest academic degree(s) and designation at the time when the work was done; (iv) details of the contribution of each author; (v) name of department(s) and institution(s) to which the work should be attributed; (vi) disclaimers, if any; (vii) name, address, telephone, fax, email address of the corresponding author, (viii) source(s) of support in the form of grants, equipment, drugs or all of these; and (ix) declaration on competing interests.

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Competing interest for a given manuscript exists when the author has ties to activities that could inappropriately influence his or her judgment, whether or not judgment is in fact affected. Financial relationships with industry for example, through employment, consultancies, stock ownership, honoraria, expert testimony, either directly or through immediate family, are usually considered to be the most important competing interests. However, conflicts can

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Each manuscript should be accompanied with a structured abstract (divided into background, methods, results and conclusions) in no more than 250 words. Four to five key words to facilitate indexing should be provided in alphabetical order along with the abstract. The text should be divided in sections on introduction, methods, results, discussion and conclusion.

Acknowledgment section may be included where necessary. Number of tables and figures should be limited to the very relevant ones and may be compressed if necessary. The typical text length for such contributions is 2500-3 500 words (excluding title page, abstract, tables, figures, acknowledgments and references).

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Short accounts of original studies are published as brief reports. The text should be divided into sections, i.e., abstract, introduction, methods, results and discussion.

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The text should contain no more than 1500 words, 3 illustrations or tables and up to 20 references, preferably recent publications.

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Letters commenting upon a recent article in the West African Journal of Orthodontics are welcome.

Such letters should be received within 6 months of the article's publication. At the editorial board's discretion, a letter may be sent to authors! experts for comments and both letter and reply may be published together. Letters may also relate to other topics of interest to orthodontists and others, and/or useful clinical observations. Letters should not be more than 400 words. The number of authors should not exceed 2, including the authors' reply in response to a letter commenting upon an article published in this journal.

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A short text of about 150 words depicting the condition with color photographs (vide infra) is needed.

Normally only clinical photographs are accepted but accompanying skiagrams or pathological images could also be considered for publication.

Photographs should be of high quality, clearly identify the condition and preferably add to the existing knowledge.

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Such articles are published on topical orthodontic issues including social aspects. It is expected that the authors have sufficient credible experience on the subject for giving viewpoints. These should not exceed 1500 words.

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Announcements for conferences, symposia, meetings or courses may be sent for publication in advance. The announcements should provide title, date(s) and place of the event and contact address, telephone, and email

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Abstract and Key Words

The second page should carry an abstract in case of original article (250 words), review article (200 words), brief report (100-150 words), and case report (50 words), respectively. For original article and reviews, the abstract should be structured as detailed earlier. For brief reports, the abstract should state the purpose of the study, basic methodology, main findings (giving specific data and statistical significance) and key conclusion(s). Below the abstract, authors should provide 3-5 key words for indexing; terms from the Medical Subject Headings (MESH) list of Index Medicus should be used. The basic structure of a paper follows the well known acronym IMRAD, which stands for Introduction (what questions was asked), Methods (how was it studied), Results (what was found) and Discussion[4].

Introduction

The introduction must clearly state the question that the author(s) tried to answer in the study. It may be necessary to briefly review the relevant literature.

Only cite those references that are essential to justify the proposed study.

Materials and Methods

The methods section should describe, in a logical sequence, how the study was designed (e.g., how randomization was done), carried out (e.g., how subjects were chosen or excluded, ethical considerations, accurate details of materials used, exact drug dosage and form of treatment, etc.) and data were analyzed (e.g., an estimate of the power of the study, exact test used for statistical analysis, etc.).

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Results

This section should include only relevant, representative data and not all information collected during the study. Major findings should be presented clearly and concisely. Text, tables, and illustrations should be used sensibly while avoiding repeating in the text all the data depicted in the tables or illustrations and emphasizing or summarizing only important observations. Tables and figures should be restricted to those needed to explain the argument of the paper and to assess its support. It is necessary to cite the tables in the text and type them on separate sheets. It may also be useful to mention what the study did not find.

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Acknowledgements

In acknowledgements section, it is suitable to list all contributors who do not meet the criteria for authorship, such as a person who provided purely technical help, writing assistance, or a department head who provided only general support. Financial and material support should also be acknowledged.

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