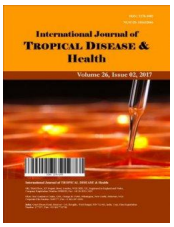

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Oral Health Knowledge and Oral Hygiene Practices among Secondary School Students in Bayelsa State: A Comparative Analysis

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Authors' contributions

This work was carried out in collaboration between all authors. Authors BCEE, FY, PSA, IES and KDS designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author BCEE managed the analyses of the study. Authors BCEE, FY, PSA, IES and KDS managed the literature searches and wrote the final draft of the manuscript. Authors OIO, NBI, BSB and BR carried out a critical review of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Objective: In the availability of documented negative attitudes to oral health care by a populace, there have also been documented reports of an inadequacy of oral health care services despite a high demand for these services in Nigeria. This study set out to assess the oral health knowledge

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and practices of students in different areas in Bayelsa State having an availability and scarcity of oral healthcare services. Significant differences in the oral health knowledge and hygiene practices of these students in the perspective of availability or scarcity of oral health care services were also sought for.

Methods: A cross-sectional survey was conducted in which a multistage sampling technique was utilized in selecting 1357 respondents from 6 secondary schools located within the study areas. Close-ended self-structured questionnaires seeking to determine the level of oral health knowledge (using a 4-point Likert scale) as well as oral hygiene practices of respondents was used as our instrument for data collection. Positive and negatively skewed questions were asked in order to effectively determine their level of oral health knowledge.

Results: Majority of students within the Bayelsa East Senatorial District 878 (91.0%) with a mean score of 16.35 ±1.95 and students within the Yenagoa metropolis 346 (88.3%) with a mean score of 15.87 + 1.70 had good knowledge of oral health. Concerning oral hygiene practices of the students in both study areas, the majority of students were shown to have good oral hygiene practices including the use of toothbrush and toothpaste, cleaning their mouths twice a day as well as changing their toothbrushes every 1 – 3 months. Most of the students had however never visited the dental clinic.

Conclusion: The availability or scarcity of oral health care services is not a determinant of good oral health knowledge or the practice of good oral hygiene in this study.

Keywords: Oral health knowledge; hygiene practices; secondary school students; bayelsa.

1. INTRODUCTION

The oral cavity is one whose health must be constantly maintained at optimal levels. This has become a necessity seeing that the oral cavity is used in the carrying out of various essential functions that impact on an individual physically, mentally as well as socially [1,2]. Harmful agents could some of the time; find their way into the oral cavity and end up affecting an individual's oral and general health. The need to thus maintain good oral hygiene in order to have sound general health can never be over-emphasized [3-6]. Having good knowledge of oral health, as well as the practice of good oral hygiene methods, have been shown to ensure the achievement of good oral health as individuals are now armed with a knowledge of what to do and what not to do in the event of oral health diseases; including visiting a dentist and not quacks, following the dentist's prescriptions as opposed to the application of herbs or other hazardous substances, maintaining dental hygiene as opposed to oral neglect amongst others [7-9].

Good oral health knowledge and oral hygiene practices including tooth brushing with a toothpaste, routine visits to the dental clinic, the use of dental floss etc; can thus be applied in ensuring the prevention of oral diseases rather than the application of curative measures to get rid of the oral disease [10,11]. A good oral health knowledge and attitude imply that an individual understands the importance of maintaining good oral health and is also disposed to having the proper perceived oral health needs. Despite the high proportion of populations requiring dental treatment, the utilization of dental health care facilities remains poor. Individuals though having an oral health problem do not perceive they have a problem until the later stages of such a problem through the manifestation of pain or gross damage to structures in the mouth [12-14].

When an oral health care problem is perceived, certain others prefer to treat by themselves by using non-orthodox methods rather than visiting the dental clinic for expert care [8]. This may, however, be due to illiteracy or an individual's socio-economic status as it has been found that dental clinic attendance increases with increasing level of education as well as high socio-economic status [15,16]. However, a high socio-economic status has also been linked to higher levels of occurrence of oral diseases [17]. Certain reasons including a pre-emptive feeling of pain from dental procedures, dental phobia, lack of time to visit the dental clinic, non-accessibility of dental health care facilities, unavailability of dental health care facilities, financial constraints amongst others have been given as reasons for not visiting the dental clinic either routinely or when an oral health problem has occurred [18-20].

In view of the revised national oral health policy in 2012 which is "*to promote optimal oral and*

general health for all Nigerians, reduce the morbidity and mortality rate, as well as reverse the increasing prevalence and incidence of oral diseases; to meet the global targets on the elimination and eradication of oral diseases and significantly ensure the maintenance of complete set of dentition through life, thus promoting general health for all Nigerians" [12], the provision of oral health care facilities and services in all states of the federation should be the focus of government at all levels. Despite documented negative attitudes to oral health care by a populace, there have also been documented reports of an inadequacy of oral health care services despite a high demand for these services in Nigeria [12,21]. The need to ensure that these services are provided and made readily accessible to the entire populace; whether young or old, through the implementation of this policy is of absolute importance, including availability to all social strata within the rural, semi-urban and urban areas of all regions. This is so because everyone must be able to easily access dental health care services at any point in time in order to ensure that optimal oral health is maintained at all points of one's life and in so doing ensure good general health and its attendant benefits not just to the individual but to the productivity of the entire populace [22-25].

Could the availability or scarcity of dental health care facilities and services be a factor affecting the level of knowledge of oral health as well as the oral hygiene practices of secondary school students in Bayelsa State? Observations have been made that within the Yenagoa metropolis which is the capital of Bayelsa State and which is located in the Yenagoa Local Government Area of the State, there is the presence of more and better equipped public and privately-owned dental care facilities providing dental health care services to the populace. This is however not the case in all other Local Government Areas of the State in which these services are lacking. This study thus developed an interest in assessing the oral health knowledge and hygiene practices of secondary school students in Yenagoa, Bayelsa State as well as in 3 other Local Government Areas (LGAs) namely Ogbia, Nembe and Brass which make up the Bayelsa East Senatorial District. These assessments were carried out in order to ascertain if there were any differences in the oral health knowledge and hygiene practices of secondary school students in the perspective of availability or scarcity of adequate oral health care services within these study areas.

2. MATERIALS AND METHODS

A cross-sectional survey was conducted in determining the oral health knowledge and oral hygiene practices of secondary school students within the Bayelsa East Senatorial District and the Yenagoa Metropolis of Bayelsa State. The Bayelsa East Senatorial District comprises Ogbia, Nembe and Brass Local Government Areas of Bayelsa State. This senatorial district occupies a land mass of about 2, 516 km^2. The people are predominantly Christians with their main occupation being farming and fishing [26]. Yenagoa is the capital of Bayelsa State located within the Yenagoa Local Government Area of Bayelsa State. Being an urban area, the concentration of dental facilities in Bayelsa State can be found within the Yenagoa metropolis. However, an observation of other Local Government Areas of Bayelsa State (including those located within the Bayelsa State East Senatorial District) showed a very low number of dental facilities and services in relation to the population. The population of study involved secondary school students attending school within the Bayelsa East Senatorial District and the Yenagoa Metropolis. A multistage sampling technique was utilized in selecting respondents from 6 secondary schools located within the study areas. Close-ended self-structured questionnaires seeking to determine the level of oral health knowledge (using a 4-point Likert scale) as well as oral hygiene practices of respondents was used as our instrument for data collection. Positive and negatively skewed questions were asked in order to effectively determine their level of oral health knowledge. Examples of questions asked to determine knowledge included: "If professional teeth cleaning made the teeth weak", "If poor oral health had a negative effect on general health", "If dental check-ups twice yearly where necessary" etc. Examples of questions to determine oral hygiene practices of respondents included: "What they used to clean their teeth", "How often toothbrushes were changed", "If they used dental floss to clean their teeth" etc. Content validity of the questionnaire, to adequately determine the level of oral health knowledge, as well as oral hygiene practices, was ensured and confirmed by a competent dental professional. The study protocol was approved by the Ethical Committee of the Bayelsa State College of Health Technology, Yenagoa, Bayelsa state, Nigeria. Informed consent was duly gotten from the respondents and the decision to complete the questionnaires

was completely voluntary. Due permission to carry out this study was also gotten from relevant authorities. This research was conducted in full accordance with the ethical principles as provided by the Declaration of Helsinki. Collated data were analyzed by using the Graph Pad Prism statistical software. Means and standard deviations of the levels of oral health knowledge were calculated and significance of the predominant level of oral health knowledge (good/bad) was tested using the unpaired t-test. In the testing relationship between the level of oral health knowledge and oral hygiene practices, the chi-squared test was utilized and statistical significance was set at the .05 level of significance for both analyses.

3. RESULTS

3.1 Demographic Data

In all, 1357 secondary school students were involved in this study. 965 of this number included students attending school within the East Senatorial District of Bayelsa State. The remainder of 392 respondents attended school in Yenagoa metropolis. Male and female students were involved in this study and all 6 arms of secondary schools (JSS 1 – SSS 3). All respondents were Christians within the East senatorial district and in Yenagoa, most of the respondents were also Christians. The demographic data of study respondents' is shown in Table 1.

3.2 Source of Oral Health Knowledge

On the source of knowledge concerning dental health in our study, most of the respondents from the Bayelsa East Senatorial District gained this knowledge from instructions given by dentists (29.4%) and from television broadcasts (26.8%). In Yenagoa metropolis, however, the majority of respondents got this knowledge from television broadcasts (43.4%). Others gained the knowledge from posters, oral health outreaches

Table 1. Demographic data of respondents

mographics	Bayelsa east senatorial district		Yenagoa (State capital)	
	965		392	
	Frequency	Percentage (%)	Frequency	Percentage (%)
1. Gender				
• Male	299	31.0	192	49.0
• Female	666	69.0	200	51.0
2. Religion				
• Christianity	965	100.0	350	89.3
• Islam	0	0.0	26	6.6
• Paganism	0	0.0	6	1.5
• Others	0	0.0	10	2.6
3. Educational level				
• JSS 1	128	13.3	80	20.4
• JSS 2	119	12.3	72	18.4
• JSS 3	136	14.1	41	10.5
• SSS 1	189	19.6	69	17.6
• SSS 2	231	23.9	75	19.1
• SSS 3	162	16.8	55	14.0

Table 2. Sources of dental health knowledge

Sources of oral health knowledge	Bayelsa east senatorial district		Yenagoa (State capital)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
• Radio broadcasts	130	13.5	56	14.3
• Television broadcasts	259	26.8	170	43.4
• Newspapers	24	2.5	16	4.1
• Magazines	21	2.2	11	2.8
• Posters	37	3.8	20	5.1
• Dentist's instruction	284	29.4	62	15.8
• Oral health outreaches	173	17.9	55	14.0
• None	37	3.8	2	0.5

carried out by oral health care personnel amongst others. The various sources of dental health knowledge in our study areas are shown in Table 2.

3.3 Assessment of the Level of Knowledge about Oral Health

Analysis of the Likert scale used to assess the level of oral health knowledge of the respondents within the Bayelsa East Senatorial District showed that 878 (91.0%) of the respondents with a mean summated score of 16.35± 1.95 showed that they had good knowledge about oral health, however 87 respondents (9.0%) with a mean summated score of 10.89± 1.35 had poor knowledge about oral health. Similar Likert analysis of responses given by respondents within Yenagoa showed that 346 (88.3%) of the respondents with a mean summated score of 15.87 + 1.70 showed that they had good knowledge about oral health, however, 46 (11.7%) respondents with a mean summated score of 10.83 ± 1.36 had poor knowledge about oral health. Unpaired t-test of individual summated scores of the respondents showed a good overall level of oral health knowledge within both study areas which was statistically significant. This distribution is shown in Fig. 1.

3.4 Oral Hygiene Practices of Respondents

Concerning oral hygiene practices of the respondents in this study, the use of toothpaste and toothbrush in cleaning the mouth was predominant, which accounted for 857 (88.8%) within the East Senatorial District and 326 (83.2%) in Yenagoa Metropolis. Other mouths cleaning agents including chewing stick as well as the use of toothbrush combined with powder, sand etc were used by the respondents in cleaning their mouths. A predominant proportion of the respondents within both study areas changed their toothbrushes every 1 – 3 months and mouth cleaning was mostly done twice daily. Majority of the respondents had also never visited the dental clinic. 51.9% of the respondents within the Bayelsa East Senatorial District, however, used dental floss as an interdental cleaning aid while only 30.9% used this within the Yenagoa Metropolis. Concerning respondents who had visited the dental clinic, the majority (50.0% & 55.1%) within the Bayelsa East Senatorial District and Yenagoa Metropolis respectively visited as a result of dental pain. The oral hygiene practices, as well as the reasons for visit to the dental clinic in our study area, are shown in Tables 3 and 4 respectively.

3.5 Relationship between the Level of Oral Health Knowledge and Oral Hygiene Practices of Respondents

A statistically significant relationship was found between the use of toothbrush/toothpaste as a means of maintaining oral hygiene and having a good knowledge about oral health within the Bayelsa East Senatorial District and Yenagoa Metropolis. This is shown in Tables 5 and 6.

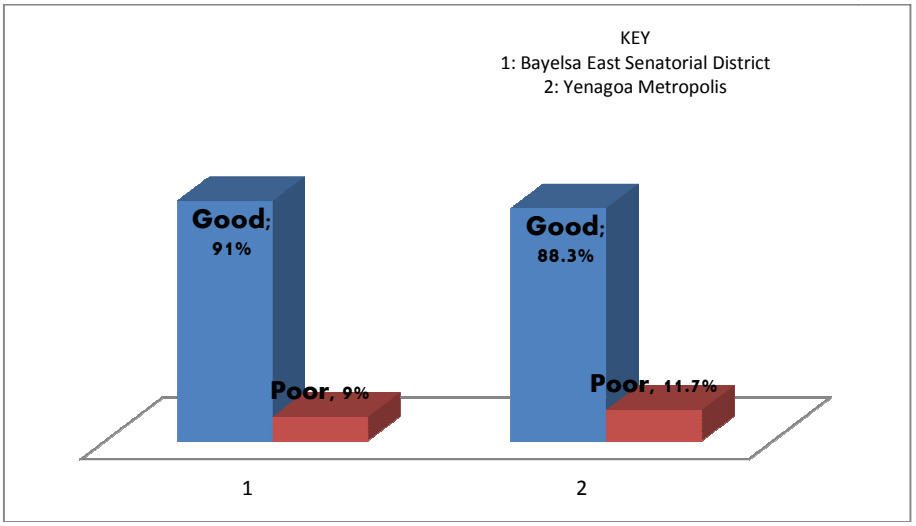

Fig. 1. Distribution of level of oral health knowledge among respondents p-value: <0.0001

Table 3. Oral hygiene practices of respondents

Oral hygiene practices	Bayelsa east senatorial district		Yenagoa (State capital)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
1. Oral hygiene aid for mouth cleaning				
• Toothbrush/Toothpaste	857	88.8	326	83.2
• Toothbrush/Powder	68	7.0	55	14.0
• Chewing Stick	23	2.4	6	1.5
• Sand	5	0.5	3	0.8
• Charcoal	11	1.1	2	0.5
• Others	1	0.1	0	0.0
2. The frequency of change of toothbrush				
• Every 1 – 3 months	804	83.3	244	62.2
• Every 4 – 6 months	94	9.7	72	18.4
• Every 7 – 12 months	21	2.2	27	6.9
• Yearly	46	4.8	49	12.5
3. The frequency of mouth cleaning daily				
• Once	227	23.5	106	27.1
• Twice	609	63.1	211	53.8
• > Twice	129	13.4	75	19.1
4. The frequency of dental clinic attendance				
• Once yearly	83	8.6	55	14.1
• Twice yearly	263	27.3	60	15.3
• Only when I have a problem	256	26.5	119	30.3
• Never visited	363	37.6	158	40.3
5. Use of dental floss				
• Yes	501	51.9	121	30.9
• No	464	48.1	271	69.1

No statistically significant difference was found when the oral hygiene practices of respondents of both study areas were comparatively assessed. (All p-values were above 0.05)

Table 4. Reasons for a dental clinic visit

Reasons	Bayelsa east senatorial district		Yenagoa (State capital)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
• Dental pain	301	50.0	129	55.1
• Mouth odour	41	6.8	36	15.4
• Bleeding gums	62	10.3	42	18.0
• Routine check-up	198	32.9	27	11.5

Table 5. Relationship between the level of oral health knowledge and the use of toothbrush / toothpaste (Bayelsa East Senatorial District)

Level of oral health knowledge →		Good	Poor
1.	Use of toothbrush and tooth paste	783	72
2.	Use of toothbrush and powder	63	5
3.	Use of Chewing stick	20	3
4.	Use of Charcoal	7	3
5.	Use of Sand	1	4
6.	Others	1	0

Chi^2: 37.13, p-value < 0.0001

Table 6. Relationship between the Level of Oral Health Knowledge and the use of Toothbrush / Toothpaste (Yenagoa Metropolis)

Level of oral health knowledge →		Good	Poor
1.	Use of toothbrush and tooth paste	294	32
2.	Use of toothbrush and powder	42	13
3.	Use of Chewing stick	5	1
4.	Use of Charcoal	2	0
5.	Use of Sand	3	0

Chi^2: 9.49, p-value = 0.05

4. DISCUSSION

The increasing burden of oral diseases which some have called a "*silent epidemic"* despite improved global efforts to tackle it is indeed worrisome. Continuous efforts have constantly been put in to ensure that there is a change in direction regarding the oral disease burden. It is, however, to note that for these efforts to yield worthwhile results, all parties involved must act concertedly towards achieving the goal of improved and sustained global oral health. This can be achieved by ensuring that as much as policies are laid down to tackle the prevalence of oral diseases, they must also be implemented to the letter. Necessary funding and resources to drive these policies should also be made available and efficiently utilized to achieve this goal [27-30].

As the knowledge of oral health and oral diseases increases so does the level of practice of oral hygiene and vice versa. The populace must be educated and awareness increased using all necessary methods of approach such that the needed oral health education is far-reaching and not just concentrated in one region or populace. All efforts must be concerted. It is also necessary to draw up modalities to ensure that this drive is sustained and constantly modified to ensure the global oral health and thus improved general health [31-33].

In this study, the level of oral health knowledge was significantly good with a vast majority of both study populations having a good understanding of what oral health was about. This is despite the observation that the provision of dental health services in one study area was far less as compared to the other. This finding is supported by findings of authors who showed a good level of oral health knowledge in the studied populations [34,35]. Although the reports of other authors were contrary to this finding as there was a gross ignorance about good oral hygiene practices [36]. Our study pointed out that 43.4% respondents residing within the Yenagoa metropolis gained this knowledge of oral health from television broadcasts which could have been during oral health adverts or oral education programmes shown on television. This was also the case in previous research which stated that television broadcasts were the main sources of oral health education [37]. Within the Bayelsa East Senatorial District, however, the majority of the respondents (29.8%) gained the knowledge of oral health from the instruction given by dentists and was closely followed by television broadcasts (26.8%). The proportion who gained their knowledge from dentists' instructions could have been the proportion of the population that visited the available dental health care facilities and were able to gain adequate oral health education. It is thus very important to note that in the delivery of oral health information to a populace, apart from utilizing the mass media, [38] it is also essential to ensure that dental health care facilities and services are adequately provided to serve all parts of the population such that those who readily utilize these services can be effectively educated on issues regarding oral health [30,39]. It can thus be deduced that the availability or scarcity of oral health care facilities or services is not a determinant of the level of knowledge of oral health seeing that our study areas had statistically significant levels of knowledge despite the scarcity of dental services in one of both study areas. However, for improved oral health education and promotion, it is necessary to ensure the availability of oral health care services [40].

Assessment of the oral hygiene practices of respondents in both study areas showed that good oral hygiene was practised by the majority of respondents. These included the use of toothpaste and toothbrush as oral hygiene mouth cleaning aids which has been found to be one of the most effective ways to remove oral debris and prevent the occurrence of oral diseases although chemical control of dental plaque has been advocated for use among certain groups of

impaired individuals, [41-43] changing of toothbrushes between one and three months of use as well as cleaning the mouth twice or more than twice a day. This result is corroborated by previous findings in which good oral hygiene was being practised by the majority of their study populations [38,44,45]. Although, some other findings have shown the prevalence of poor oral hygiene practices including brushing teeth once daily, never having visited the dental clinic or only visiting the dental clinic when there was a dental – related problem [32,46-48]. This study presented with such findings in which the majority of respondents in both areas had never visited the dental clinic which may have been as a result of unavailability or inaccessibility of dental clinics especially within the Bayelsa East Senatorial District, fear of the dental clinic or dental instruments or procedures known as dental phobia, unfavourable previous recounted experiences of those whom had visited the dental clinic, expensive cost of dental treatments amidst financial constraints experienced by patients needing such treatments, coming from a poor family background, misconceptions and wrong beliefs regarding oral health and dental treatments e.t.c. [29,47,49-53]. For respondents who had visited the dental clinic, the majority of them had done so as a result of dental pain which has been reported to be a major reason for dental visits around the world. This practice should be strongly discouraged and the populace should be made to understand the reason for routine visits to the dental clinic which is far more effective in maintaining oral health through prevention or prompt treatment of oral diseases [35,40,48,54,55].

This study also showed a statistically significant relationship between having good knowledge of oral health and the good oral hygiene practice of toothbrushing using the proper toothbrush and toothpaste. This has also been reported by other researchers [56]. When comparatively assessed, there was no statistically significant difference between the good oral hygiene practices of respondents of both study areas in this study, thus enabling the conclusion that the availability or scarcity of oral health care facilities or services is not a determinant of the practice of good oral hygiene or level of knowledge of oral health within the areas studied in this research.

In Nigeria, there has to be a continuous concerted drive to achieve maximal implementation of the oral health policy. Oral health promotion efforts should be stepped up as much as possible targeting all members of the society from children to the elderly. The populace should be made aware of the importance of maintaining optimal oral health by maximally utilizing oral health services and abstaining from self-treatment of oral diseases using harmful means, more Nigerians should be encouraged to register in the National Health Insurance Scheme (NHIS), more oral health care services should be incorporated into the health insurance scheme to encourage increased utilization of these services. The promotion of optimal oral and general health, the reduction of cases of illness or death due to oral diseases and attainment of global targets in tackling oral diseases and maintaining oral health and thus improved general health can be and will be ultimately achieved in Nigeria when all play their vital roles in fulfilling this dream [33,48,49,57].

5. CONCLUSION

This study shows that the availability or scarcity of oral health care facilities or services is not a significant determinant of knowledge of oral health or of the practice of good oral hygiene as both areas studied (one with available oral health facilities and services and the other lacking these facilities and services) had a large proportion of their populace who had good oral health knowledge as well as practised good oral hygiene.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Johnson JO. Oral Health Knowledge, Attitudes, and Practices Among Secondary School Students in Nigeria. Public Health PhD dissertation, College of Health Sciences, Walden University; 2014.
   Available:http://scholarworks.waldenu.edu/dissertations
2. Ephraim-Emmanuel BC, Asara AA, Ronami O, Francis E. Prevalence of dental fluorosis among secondary school children in Oloibiri Community. International Journal of Tropical Disease & Health. 2016;11(1):1-7. DOI: 10.9734/IJTDH/2016/20773
   ISSN: 2278–1005
   Available:www.sciencedomain.org

3. Terrence T, John F, Sholchl K, Darryl J, Stephen A, Phillip C, Jamie B, Phillip K. Chemical safety of drinking water: Assessing priorities for risk management. WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland; 2007.
   ISBN: 978 92 4 154676 8
4. Abruquah AA, Dsane M. Oral hygiene awareness among junior high school students in Ghana. International Journal of Medical and Biomedical Sciences. 2014; 2(3):034-038.
   ISSN: 2315-9954
   Available:https://www.watchpub/ijmbs/index.htm
5. Baral P, Bhattarai C, Poudel PP, Banstola D, Roy S, Hada S, Hiremath SS. A study on oral hygiene practice among school children of Pokhara Municipality. J. GMC-Nepal. 2009;2(2):37-38.
6. Angela MB, Patricia MD, Janet M, Kaye R. Systematic literature review of oral hygiene practices for intensive care patients receiving mechanical ventilation. Am J Crit Care 2007;16(6):552-562.
   Available:http://www.ajcconline.org
7. Obuna JA, Ugboma HAA, Igbinedion H, Ejikeme BN, Agwu UM, Ugboma EW. Awareness pf pregnancy-related oral diseases in women attending antenatal clinics in a University Teaching Hospital in Nigeria. Int. J. Trop. Med. 2012;7(2):61-63. ISBN: 1816-3319.
8. Ephraim-Emmanuel BC, Dotimi DA, Apiakise EW, Arogo A, Diekedie A, Abali EW. Traditional remedies used in the treatment of dental ailments: A case study of Otakeme community in Bayelsa State. Point J. Med. Med. Res. 2015;1(2):036-041. Available:http://www.pjournals.org/PJMMR
9. Cheah WL, Tay SP, Chai SC, Bong CS, Luqmanul HB, Zhuleikha BJCJ. Oral health knowledge, attitude and practice among secondary school students in Kuching, Sarawak. Arch. Orofac. Sci. 2010; 5(1):9-16.
10. Folayan MO, Khami MR, Folaranmi N, Popoola BO, Sofola OO, Ligali TO, Esan AO, Orenuga OO. Determinants of preventive oral health behaviour among senior dental students in Nigeria. BMC Oral Health. 2013;13:28:1-10.
    Available:http://www.biomedcentral.com/1472-6831/13/28
11. Guddad SS, Suragimath G, Abbayya K, Mohitey JK, Varma AS, Zope SA. An insight into oral health practices among 1st Year Medical Students of Karad, India: A questionnaire study. Journal of Dental Research and Scientific Development. 2015;2(1):3-7.
    E-ISSN: 2348-3407
    DOI: 10.4103/2348-3407.149624
    Available:www.iadrsd.org
12. Folayan MO, Chukwumah NM, Onyejaka N, Adeniyi AA, Olatosi OO. Appraisal of the national response to the caries epidemic in children in Nigeria. BMC Oral Health. 2014;14:76:1-10.
    Available:http://www.biomedcentral.com/1472-6831/14/76
13. Kompalli PV, Mahalakshmi M. Knowledge, attitude and practices of school children and teachers of khammam towards oral hygiene. Webmed Central. 2013;4(2):1-6. ISSN: 2046-1690. WMC004021
    Available:http://www.webmedcentral.com/article_view/4021
14. Ephraim-Emmanuel BC, Ideede V, Dotimi DA, Vincent P, Baraka B, Udeaja C. The relationship between the oral hygiene practices and the dental caries status of students of the Bayelsa State College of Health Technology, Otuogidi, Ogbia – Town. International Journal of Current Research. 2014;6(05):6842-6846.
    ISSN: 0975-833X
    Available:http://www.journalcra.com
15. Kasusu KN. Health and oral health-related knowledge, attitudes and behaviours – a study of secondary school students in Dar es Salaam, Tanzania. A Cross-Sectional Study of 16-20-year-old students. MSc Thesis, University of Bergen, Norway; 2012.
16. Olusile AO, Adeniyi AA, Orebanjo O. Self-rated oral health status, oral health service utilization and oral hygiene practices among adult Nigerians. BMC Oral Health. 2014; 14:140:1-9.
    DOI: 10.1186/1472-6831-14-140
17. Trung DLN. Oral health status and related factors among primary school children in Soc Son District, Hanoi City, Vietnam. MSc Thesis, Mahidol University; 2008.
18. Ajayi DM, Arigbede AO. Barriers to Oral Health Care Utilization in Ibadan, South West Nigeria. Afr. Health Sci. 2012;12(4): 507-513.
    Available:http://dx.doi.org/10.4314/ahs.v12i4.17

19. Arun KPP, Shankar S, Sowmya J, Priyaa CV. Oral health knowledge, attitude and practice of school students of KSR Matriculation School, Thiruchengode. JIADS. 2010;1(1):5-11.
20. Omili M, Ofili AN, Omuemu V. Oral health perception among officers and men of the Nigerian prisons service, Abuja. Eur. J. Gen. Dent. 2013;2:252-256.
    DOI: 10.4103/2278-9626.116006
    Available:www.ejgd.org
21. Bamise CT, Bada TA, Bamise FO, Ogunbodede EO. Dental care utilization and satisfaction of residential university students. Libyan J. Med. 2009;140-143. AOP: 080601.
    Available:www.ljm.org.ly
22. Rustvold, Susan Romano. Oral health knowledge, attitudes, and behaviors: Investigation of an educational intervention strategy with at-risk females. Dissertations and Theses. Paper 612. Portland State University; 2012.
    Available:http://pdxscholar.library.pdx.edu/open_access_etds
23. Gaiao LR, Almeida MEL, Filho JGB, Leggat P, Heukelbach J. Poor dental status and oral hygiene practices in institutionalized older people in Northeast Brazil. International Journal of Dentistry. 2009;1-6: Article ID 846081.
    DOI: 10.1155/2009/846081
24. Adebola RA, Bamgbose BO, Adeoye JB, Amole TG. Awareness of oral cancer in a Northwestern Nigerian State: Assessing the Knowledge, Opinion, and Practice of Traditional Healers and Herbalists. Journal of Oral Oncology. 2013;1-7:Article ID 263150.
    Available:http://dx.doi.org/10.1155/2013/263150
25. Bhardwaj VK. Gerodontology-orodental care for elderly. Eur. J. Gen. Dent. 2012; 1(1):15-9.
    DOI: 10.4103/2278-9626.101349
    Available:www.ejgd.org/temp/EurJGenDent1115-3818312_103623.pdf
26. Atiegha C, Indeed V, Dick PD, Orutugu LA, Igoni M, Reuben I. ABO and Rhesus Blood Group distribution: A case study of Bayelsa East Senatorial District, South-South, Nigeria. Nig. J. Health All. Res. 2015; 1(1):44-48.
    ISSN: 2488-8710
    Available:www.njhar.org
27. Maze B. A Canadian oral health strategy, federal, provincial and territorial dental directors. 2005;1-53.
28. Shamsi M, Hidarnia A, Niknami S. Self-reported oral hygiene habits and self-care in the oral health in sample of iranian women during pregnancy. Middle-East Journal of Scientific Research. 2013;13(1):91-100.
    ISSN: 1990-9233
    DOI: 10.5829/idosi.mejsr.2013.13.1.6557
29. Braimoh OB, Odai ED. A survey of dental students on global oral health issues in Nigeria. J. Int. Soc. Prev. Commun. Dent. 2014;4(1):17-21.
    DOI: 10.4103/2231-0762.127210
    Available:www.jispcd.org
30. Shirazi UR, Naz F, Yousuf M. DMFT index among dental undergraduates of lahore medical and dental college in different professional years of dentistry. Pak. Oral Dental J. 2013;33(1): 156-159.
31. Madhan KS, Singarampillay V, Natrajan S. Oral hygiene awareness among two non-professional college students in Chennai, India- A pilot study. Int. J. Sci. Res. Public. 2012;2(5):1-5.
    ISSN: 2250-3153
    Available:www.ijsrp.org
32. Sofola OO. Implications of Low Oral Health Awareness in Nigeria. Niger. Med. J. 2010;51(3):131-133.
33. Carneiro L, Kabulwa M, Makyao M, Mrosso G, Choum R. Oral health knowledge and practices of secondary school students, Tanga, Tanzania. Int. J. Dent. 2011;Article ID 806258:1-6.
    DOI: 10.1155/2011/806258
34. Hakansson S, Sturesson A. Oral hygiene experience, knowledge of oral health and oral diseases and attitudes about oral health care- a questionnaire study among students of nursing in Zambia. Empirical Study. School of Health and Society, Dental Hygienist Programme. 2010;180hp: OH8361.
35. Bastola D, Baral P, Hada S, Hiremath SS, Bhattarai C, Poudel PP, Roy S. Assessment of level of awareness of oral hygiene practice among patients of Kaski District of Nepal. 2009;1-5.
36. Ephraim-Emmanuel BC, Fagha T, Okeke OI, Umezurike OR, Apiakise EW, Idumesaro NB. Oral health knowledge and oral hygiene practices of two selected communities in Ogbia Local Government Area of Bayelsa State,

Nigeria. Point J. Med. Med. Res. 2015;1(3):046-054.
ISSN 2467-8813
Available:http://www.pjournals.org/PJMMR

37. Ogunrinde TJ, Oyewole OE, Dosumu OO. Dental care knowledge and practices among secondary school adolescents in Ibadan North Local Government Areas of Oyo State, Nigeria. Eur J Gen Dent. 2015; 4(2):68-73.
ISSN: 2278-9626
Available:http://www.ejgd.org
38. Azodo CC, Unamatokpa B. Gender difference in oral health perception and practice among medical house officers. Russian Open Medical Journal. 2012; 1:0208:1-4.
ISSN: 2304-3415
Available:www.romj.org
39. Folayan MO, Khami MR, Folaranmi N, Orenuga O, Popoola BO, Olatosi OO, Ligali TO, Sofola OO, Adeniyi AA, Esan A, Osaguona A. Determinants of preventive dental practice for children among final-year dental students in Nigeria. International Journal of Paediatric Dentistry. 2013;1-8.
DOI: 10.1111/ipd.12024
Available:http://www.researchgate.net/publication/235646356
40. Chien-Huey SC, Yeng-Hung S. Knowledge of dental health and oral hygiene practices of taiwanese visually impaired and sighted students. Dental Health. 2004; 98(5):1-27.
Available:http://www.afb.org/jvib/jvib980504.asp
41. Ahmad MS, Jindal MK, Khna S, Hashmi SH. Oral health knowledge, practice, oral hygiene status and dental caries prevalence among visually impaired students in Residential Institute of Aligarh. Journal of Dentistry and Oral Hygiene. 2009;1(2):022-026.
Available:http://www.academicjournals.org/JDOH
42. Mustahsen MR, Mahmood N, Betul R. The relationship of caries with oral hygiene status and extra–oral risk factors. J Ayub Med Coll Abbottabad. 2008;20(1):103-108.
Available:http://www.ayubmed.edu.pk/JAMC/PAST/108 20-1/Mustehsen.pdf
43. Dawani N, Afaq A, Bilal S. Oral health knowledge, attitude and practices amongst teachers of public school set-up of Karach, Pakistan. J Dow Uni Health Sci. 2013; 7(1):15-19.
44. Ephraim-Emmanuel BC, Ideede V, Dotimi DA, Samuel WR, Baraka B. The relationship between the oral hygiene practices and the oral hygiene status of students of the Bayelsa State College of Health Technology, Otuogidi, Ogbia-town. Int. J. Curr. Res. 2014;6(4):6322-6326.
ISSN: 0975-833X
Available:http://www.journalcra.com
45. Folayan MO, Kolawole KA, Oyedele T, Chukumah NM, Onyejaka N, Agbaje H, Oziegbe EO, Osho OV. Association between knowledge of caries preventive practices, preventive oral health habits of parents and children and caries experience in children resident in sub-urban Nigeria. BMC Oral Health. 2014;14:156:1-10.
DOI: 10.1186/1472-6831-14-156
Available:http://www.biomedcentral.com/1472-6831/14/156
46. Peltzer K, Pengpid S. Oral health behaviour and social and health factors in university students from 26 low, middle and high income countries. Int. J. Environ. Res. Public Health. 2014;11:12247-12260.
DOI: 10.3390/ijerph111212247
ISSN: 1660-4601
Available:www.mdpi.com/journal/ijerph
47. Bashiru BO, Anthony IN. Oral self-care practices among university students in Port Harcourt, Rivers State. Niger Med J. 2014;. 55:486-9.
DOI: 10.4103/0300-1652.144703
Available:www.nigeriamedj.com
48. Ephraim-Emmanuel BC, Dotimi DA, Idumesaro NB, Usiholo JE, Apiakise EW, Gambia G, Ayibatonye N. An assessment of prevalent dental ailments, treatments are done and reasons for exodontia among dental patients in Bayelsa State, Nigeria. Point J. Med. Med. Res. 2015;1(1):024-030.
ISSN: 2467-8813
Available:http://www.pjournals.org/PJMMR
49. Buerlein J. Awareness of oral health among pregnant women and new mothers: Preliminary findings. 1020 19th Street NW, Suite 400, Washington DC. 20036. 202 833 8288; 2010.
Available:www.cdhp.org
50. Saskatchewan Prevention Institute. Knowledge, attitudes, beliefs and practices regarding oral health among pregnant women. 2014;1-21.
51. Ndaigah S. Oral health knowledge, attitudes and practices among students in two secondary schools in Laikipia County. BDS Research Work, University of Nairobi; 2010.

52. Adeniyi A, Agbaje O, Braimoh M, Ogunbanjo O, Sorunke M, Onigbinde O. A survey of the oral health knowledge and practices of pregnant women in a Nigerian Teaching Hospital. Afr. J. Reprod. Health. 2011;15(4):14-19.
53. Arlene K. Oral health- more than just cavities. Queen's Printer for Ontario. Catalogue No.: 016978; 2012.
ISBN: 978-1-4435-9465-3
54. Zhu L, Petersen PE, Wang HY, Bian JU, Zhang BX. Oral health knowledge, attitudes and behaviour of adults in China. Int. Dent. J. 2005;55(4):231-241.
55. Dakhili S, Alsuwaidi NO, Saeed S, Murad SB, Mohammad D, Muttappallymyalil J, Prasad P, Gopakumar A, Khan FA. Oral hygiene: Association between knowledge and practice among school-going children in Ajman, United Arab Emirates. American Journal of Research Communication. 2014;2(10):39-48.
ISSN: 2325-4076
Available:www.usa-journals.com
56. National Nutrition Surveillance Centre. Oral Health. Published by the Dental Health Foundation, Ireland in association with the Northern Area Health Board, the East Coast Area Health Board, the South Western Area Health Board and the Health Promotion Unit, Department of Health and Children; 2001.
ISBN: 0 9540263 2 2
57. Ebtissam ZM. Diet, oral hygiene practices and dental health in autistic children in Riyadh, Saudi Arabia. OHDM. 2014; 13(1):91-96.

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