

Oral health status of inhabitants of Messamena, East Region of Cameroon: A Community Dental Outreach Study

George Ashu Agbor-Ntoh ^{1,2}, Mary-Flavie Nkanjo Bombey ^{1,3,*}, Michael Fonyuy Wolani ^{1,5}, Cynthia Mbuh Ngwi ¹, Keren-Happuch Missibi Menih ^{1,4}, Clavice Wopong Awa ¹, Ranebel Forlemu Meniemoh ¹, Kevin Noumtchue Nana ¹, Simon Nzindo Nzie ¹ and Elysée Sayap Mboumbi ^{1,5}

¹ *Eden Global Missions, Buea, Cameroon.*

² *Institute of Global Health and Development, Queen Margaret University, Edinburgh, United Kingdom.*

³ *Department of Public Health, University of Buea, Buea, Cameroon.*

⁴ *Faculty of Life Sciences and Education, University of South Wales, United Kingdom.*

⁵ *Department of Internal Medicine and Specialties, University of Yaoundé 1, Yaoundé, Cameroon.*

World Journal of Advanced Research and Reviews, 2025, 25(01), 482-489

Publication history: Received on 27 November 2024; revised on 05 January 2025; accepted on 07 January 2025

Article DOI: <https://doi.org/10.30574/wjarr.2025.25.1.0044>

Abstract

Objectives: Access to dental care in rural parts of Cameroon is a public health problem. Short-term oral health interventions in rural communities provide vital relief and access to specialized dental services. This study was carried out after a dental outreach to describe the oral health status, dental hygiene and dental habits among the inhabitants of Messamena, East Cameroon.

Method: This study used secondary data and adopted a cross-sectional study design. Participants took part in a free health and dental outreach at the Messamena district hospital in August 2024. Data was entered into Kobo Collect and analyzed for socio-demographics, dental hygiene, dental habits, general oral health, and satisfaction of participants.

Results: Data from 53 participants who attended the dental outreach was analyzed. Most participants had never visited a dentist (69.8%), and only 34% brushed their teeth at least twice a day. Products used for toothbrushing included fluoridated toothpaste (48.5%), soap (19.1%), salt (8.8%), and charcoal (7.4%). Analysis of the debris and tartar index showed poor oral hygiene (94.3%). Most participants had plaque and calculus indices of two. Almost all participants (98.1%) were satisfied with the intervention that was carried out. Generally, participants in this outreach had poor oral hygiene and several oral health diseases which were exacerbated by the lack of accessible oral healthcare and oral health professionals.

Conclusion: This study reveals the need for dental outreaches and the need to provide rural communities like Messamena with long-term preventive and curative dental services.

Keywords: Oral health; Dental outreach; Rural; Messamena

1. Introduction

Oral health is defined as the state of being free from mouth and facial pain, oral and throat cancer, oral infections and sores, periodontal disease, tooth decay, tooth loss and other diseases and disorders that affect the oral cavity [1]. It encompasses the ability to speak, smile, smell, touch, chew, swallow, and convey a range of emotions through facial expressions with confidence, without pain, discomfort, or disease [1]. Oral health is thus a key component of overall

* Corresponding author: Mary-Flavie Nkanjo Bombey.

health and wellbeing. According to the World Health Organization (WHO), oral diseases are among the most common non-communicable diseases in Africa. Dental caries particularly is a common problem, with significant impact on the health of people living in sub-Saharan Africa [2]. Oral health diseases can cause significant pain, discomfort, tooth loss, malnutrition, and impair a person's ability to eat, communicate, and smile confidently. Furthermore, untreated dental caries and periodontal disease could lead to health outcomes such as cardiovascular diseases, respiratory infections, and diabetes [3]. Globally, changes in eating and lifestyle habits, alongside other factors have led to increased prevalence of oral diseases. In Cameroon, the situation is critical with up to 60.2% of the population aged 5 years and above affected with oral diseases [2]. Rural settings tend to have worse oral health outcomes in comparison to urban settings [4]. Several factors could explain why rural areas have a high prevalence of oral diseases. From a health system perspective, limited education and communication on dental hygiene in these contexts limit preventive habits, facilitating the onset of oral diseases. Moreover, inhabitants of rural areas usually have limited access to oral healthcare services [4]. Cameroon has a low dentist-to-population ratio of 1:50,000; with most of these professionals practicing in the urban areas [5]. Furthermore, rural populations in Cameroon must contend with extremely limited finances and poor transportation to access available dental clinics. These barriers do not only hinder timely intervention but also perpetuate cycles of poor oral health [1]. Also, inadequate oral hygiene practices in rural settings such as the use of chewing sticks, baking soda, chalk, potash, alum, and charcoal during brushing compound the incidence of oral health disease in rural communities. The above factors have been demonstrated to have a considerable influence on the development of dental caries, periodontal diseases, oral pre-cancerous lesions, and oral cancer [6,7].

Dental outreaches in rural communities potentially address the gap in accessing dental services. Such outreaches are increasing in rural Cameroon and allow the possibility of documenting oral health interventions and the oral health status of inhabitants of rural Cameroon. This is necessary to provide evidence of the dental access problem and a basis for solutions to be considered. This study reports findings on the oral health status of inhabitants of Messamena, East Cameroon, following a free community dental health outreach.

2. Methods

This study used secondary data and adopted a cross-sectional study design. This study was carried out following a free community health outreach organized by Eden Global Missions, a charity organization that does regular medical outreaches in Cameroon. This health outreach held from August 26, 2024, to August 31, 2024, and comprised of several clinics, amongst which was a dental clinic. The dental clinic was staffed by dentists and performed three main activities: Oral health education, an oral examination, and dental treatments. Dental treatment included dental extractions, scaling, and prescription of pharmaceutical products when necessary. The oral examination was recorded in the patients' records kept by Eden Global Missions. Administrative authorization from the Ministry of Public Health prior to the outreach, which was carried out at the Messamena district hospital, a government-run primary healthcare facility without a dental unit, in the East Region of Cameroon.

Authorization was provided by Eden Global Missions for data to be used. Patients' data was coded using alpha-numeric codes and entered in a questionnaire created in the kobo collect software. Questionnaires captured routine questions posed by the dentist on participants and included socio-demographic information, information on dental hygiene, information on dental habits, oral health characteristics of participants and on patient satisfaction following the intervention. Data was analyzed using the Statistical Package for Social Sciences (SPSS) software, version 25. Analyzed data was expressed as means [standard deviation] for continuous variables and numbers [percentages] for categorical variables.

3. Results

A total of 53 people were consulted during the dental outreach. Their ages ranged between 8 and 71 years, with a mean age of 37 ± 16 years. Majority of participants (35.8%) were between 40 to 55 years. Most participants were female, (75.5%). More than half of the participants were single (56.6%), most being Christians (98.1%). Also, more than half of the population had a secondary level of education (60.4%) and about half of the population was self-employed 27(50.9%). Socio-demographic characteristics of the study population are shown in table 1.

Table 1 Socio-demographic characteristics of participants

Variable	Categories	Frequency (n)	Percentage (%)
Age group	8-23	14	26.4
	24-39	13	24.5
	40-55	19	35.8
	56-71	6	11.3
	>71	1	1.9
Gender	Female	40	75.5
	Male	13	24.5
Marital status	Married	17	32.1
	Single	30	56.6
	Widow(er)	6	11.3
Religion	Christian	52	98.1
	Muslim	1	1.9
Education level	Non	2	3.8
	Primary	13	24.5
	Secondary	32	60.4
	Tertiary	6	11.3
Employment status	Employed	7	13.2
	Self-employed	27	50.9
	Unemployed	19	35.8

About half (50.9%) of the participants had visited a dentist in the past. More than half (60.4%) of the population declared to brush their teeth one time a day. Some participants [n=19(35.8%)] were ignorant of how long they brushed their teeth. Almost half 33(48.5%) of all participants used a toothbrush and most reported the use toothpaste when brushing. Majority of participants had a calculus index score of 2 [n=33(62.3%)] and 1 [n=16(30.2%)]. Overall, almost all participants had poor oral hygiene [n=50(94.3%)] [8].

Table 2 Participants' oral hygiene and eating habits

Variable	Category	Frequency (n)	Percentage (%)
Prior dental visit	No	26	49.1
	Yes	27	50.9
Frequency of dental visits	Every 6 months	3	5.7
	Every year	3	5.7
	In case of pain	10	18.9
	Never	37	69.8
Place of visit	Abong Mbang	4	7.5
	Bertoua	4	7.5
	Douala	1	1.9
	Yaoundé	5	9.4

	None	36	67.9
	Unknown	3	5.7
Frequency of brushing (per day)	1 time	32	60.4
	2 times	18	34
	3 times	1	1.9
	Never	2	3.8
Duration of brushing (mins)	< 1 minute	16	30.2
	2 minutes	11	20.8
	3 minutes	4	7.5
	> 5 minutes	3	5.7
	I don't know	19	35.8
Oral hygiene tools	Others	1	1.9
	Toothbrush	52	98.1
Oral hygiene adjuvants	Toothpaste	33	48.5
	Charcoal	5	7.4
	Salt	6	8.8
	Soap	13	19.1
	Others	11	16.2
Plaque index	Degree 0	5	9.4
	Degree 1	22	41.5
	Degree 2	25	47.2
	Degree 3	1	1.9
Calculus index score	Excellent	3	5.7
	Poor	50	94.3
Calculus index	Degree 0	3	5.7
	Degree 1	16	30.2
	Degree 2	33	62.3
	Degree 3	1	1.9
Oral hygiene (CI)	Good	3	5.7
	Poor	50	94.3

Majority had between one to three missing teeth (26.4%) with about (9.4%) patients having between 14 to 16 missing teeth. The maximum number of missing teeth in a patient was 16 and the minimum was 1. About (45.3%) had 1 to 3 decayed teeth with the lowest (3.8%) having about 7 to 9 decayed teeth. The maximum number of decayed teeth in patients was 14 and the minimum was 1. About half of the population had apical periodontitis (50.7%) as shown in table 3 below.

Table 3 Oral health characteristics and treatment received

Variable	Category	Frequency (n)	Percentage (%)
Missing teeth	1-3	14	26.4
	11-13	1	1.9
	14-16	5	9.4
	4-6	4	7.5
	7-10	3	5.7
	None	26	49.1
Decay teeth	1-3	24	45.3
	4-6	18	34.0
	7-9	2	3.8
	>10	3	5.7
	None	6	11.3
Filled teeth	3	1	1.9
	8	2	3.8
	None	50	94.3
Reasons for consultation	Acute pain	19	33.9%
	Chronic pain	23	41.1%
	Bleeding gums	2	3.6%
	Mouth odor	1	1.8%
	others	7	12.5%
	Routine consultation	4	7.1%
Diagnosis	Gingivitis	17	23.3
	Apical Periodontitis	37	50.7
	Pulpitis	2	2.7
	Dentinitis	6	8.2
	Others	11	15.1
Treatment received	Prescription	26	25.5
	Scaling	42	41.2
	Extraction	29	28.4
	Referral	5	4.9

Regarding patient satisfaction, most participants (98.1%) were satisfied with their treatment as shown in figure 1 below.

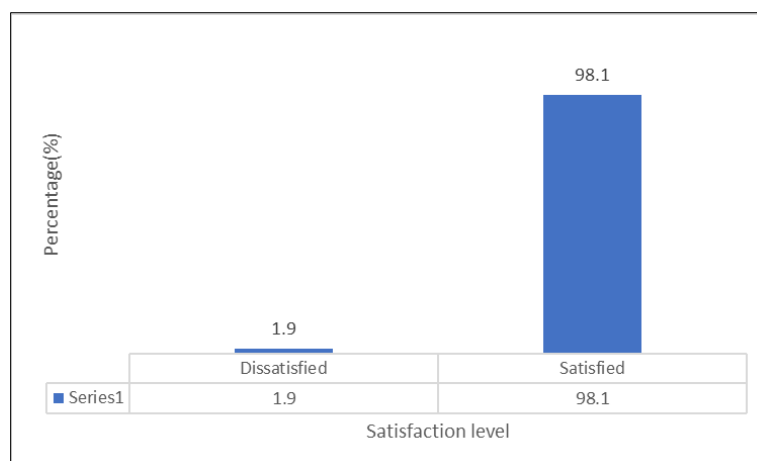


Figure 1 Participants satisfaction levels after treatment

4. Discussion

Considering the important, yet under-reported state of oral health and oral health interventions in rural Cameroon, this study provides insights to the oral health of inhabitants of the Messamena community in East Cameroon. Generally, participants in this dental outreach had poor oral hygiene and several oral health diseases which were exacerbated by the lack of accessible oral healthcare and oral health professionals.

Intriguingly, the female population was about three times that of the male population attending the dental clinic. This difference could suggest that the female gender in this community tends to seek for dental care more than the male gender, rather than it being an indicator of more dental pathologies in the female population. The socio-demographic characteristics of participants were similar to related studies and typical of rural populations in Cameroon, with most participants being informally employed with self-sustenance and having a secondary level of education [9,10]. In a study that looked at social and environmental determinants of oral health, Tchounwou *et al.* indicated that lower socio-economic situations characterized by educational level, income, or occupation would be linked to a higher prevalence of dental caries [11]. Even though most participants had met a dentist in the past, most had not visited a dentist in a long time (2 years). The American Dental Association recommends visiting a dentist at least once a year for dental check-ups and twice for dental cleaning. This shows a poor adherence to oral health standards and could be linked to the unavailability of dental clinics in this community. The closest dental clinics are in Abong Mbang, Bertoua, Yaoundé, and Douala; the minimum being 94km away from Messamena. This further emphasizes that access to dental care is a public health problem in Cameroon [12]. Although there have been improvements in recent years, inequities in the distribution of oral health services persist between urban and rural communities in Cameroon [13]. The oral hygiene of this population was generally poor, with most participants having plaque and calculus indices of two. This may be linked to poor brushing habits (mostly once daily and for less than a minute) and non-utilization of recommended oral hygiene adjuvants [14]. The American Dental Association recommends brushing at least twice daily, especially after meals and for at least 2 minutes, using the appropriate brushing technique, tools and oral hygiene adjuvants [15]. No participant reported using interdental cleaning aids. Most participants used charcoal, salt, and soap, as oral hygiene adjuvants. This could be explained by the fact that they could not afford fluoridated toothpaste. This shows a gap in oral health education and should be considered a serious concern. Our findings are comparable to the findings in a study carried out in Bafia, Cameroon, in individuals aged 5-17 [16]. In their study, Tchounwou *et al.* highlighted and recommended educational interventions that foster autonomy and change in health behaviors to promote oral health preventative practices [11]. Apical periodontitis was the most prevalent dental pathology. Periapical infections occur when bacteria access the pulp chamber and spread to the tooth apex [17]. During consultations, most participants reported previous episodes of facial swellings following toothaches. These symptoms are linked to delayed dental treatment which can be explained by difficulties accessing dental treatment. In previous studies, procrastination of dental treatment was linked with increased cost of treatment [18]. The chief complaint of most participants was chronic pain. Chronic pain is defined by the International Association for the Study of Pain as persistent or recurrent pain lasting longer than 3 months. More than a third of the participants were presented with acute dental pain. This is not surprising given that pain is the most common symptom that compels patients to seek dental advice and therapy [19]. Several participants had their teeth extracted. In most cases, participants' teeth were completely worn out, warranting dental extraction. Moreover, due to the scarcity of dental physicians and the perceived cost of treatment, participants preferred to have treatable teeth

extracted. Regarding the satisfaction survey, it revealed that almost all participants (98.1%) were satisfied. This could be an indicator of the effectiveness and potential impact of this intervention for the community of Messamena.

Although this report highlights key findings, we acknowledge that the sample size was insignificant to make strong inferences and conclusions on the state of the oral health of the inhabitants of Messamena. However, this report could serve as a basis for in-depth studies on oral health and dental services provided in rural parts of Cameroon.

5. Conclusion

This study provides a vivid picture of what could be the oral health status of the inhabitants of Messamena in rural Cameroon while highlighting poor oral health. Short-term interventions like dental outreaches are an effective tool to limit the incidence of oral diseases in remote and rural communities. Permanent solutions for the oral health of rural communities like available and accessible dental care must be considered.

Compliance with ethical standards

Acknowledgments

The authors would like to express their gratitude to Eden Global Missions who provided funding for this research.

Disclosure of conflict of interest

The authors declare no competing interest.

Authors contribution

All authors have read and agreed to the final version of this manuscript and have equally contributed to its content and to the management of the manuscript.

References

- [1] World Health Organization (WHO). Oral Health [Internet]. Geneva: WHO; 2024 [Cited 2024 September 15]. Available from: <https://www.who.int/health-topics/oral-health>
- [2] Aimond G, Thivichon-Prince B, Bernard-Granger C, Gisle C, Caron T, Jiokeng AV et al. Oral Health of Rural Cameroonian Children: A Pilot Study in Bamendou. *Children*. 2013; 10(8): 1-10.
- [3] Banihashem Rad SA., Esteves-Oliveira M, Maklennan A, Douglas GVA, Castiglia P, Campus G. Oral health inequalities in immigrant populations worldwide: A scoping review of dental caries and periodontal disease prevalence. *BMC Public Health*. 2024; 24(1), 1-16.
- [4] Njamshi AK, Dohvoma VA, Kemta F, Maopure YN, Jabea W, Mbatchou NBH (2023). Oral health challenges in rural Cameroon: prevalence of dental caries and gingivitis in children. *BMC oral health*. 2023; 23:
- [5] WHO. Regional Oral Health Strategy 2016–2025: Addressing Oral Diseases as Part of Noncommunicable Diseases. WHO; 2016 [Internet]. Available at: <https://www.afro.who.int/publications/regional-oral-health-strategy-2016-2025-addressing-oral-diseases-part-noncommunicable>
- [6] Nguendo-Yongsi B. Patterns, Practices, and Level of Buccodental Hygiene in Individuals Aged 5 to 17 Years in Bafia, Cameroon. *J Oral Health Community Dent*. 2021; 16(1), 9–13.
- [7] Azodo CC, Agbor AM. Gingival health and oral hygiene practices of schoolchildren in the Northwest Region of Cameroon. *BMC Res Notes*. 2015; 8(1): 1-6.
- [8] Michael A, Bruno K, Tetu A, Tambo E, Mark K, Sudeshni N. Oral health delivery in refugee camps in East Region of Cameroon. *Afr Health Sci*. 2023; 23(2): 606–15.
- [9] Agbor M, Kaptue B, Acha-teku t, Tambo E, Keboa M, Naidoo S. Oral Health delivery in refugee camps in the east region of Cameroon. *Afr Health Sci*. 2023; 23(2): 606-15.
- [10] National Institute of Statistics. THIRD SURVEY ON EMPLOYMENT AND THE INFORMAL SECTOR IN CAMEROON (EESI3). Yaounde, Cameroon. National Institute of Statistics; 2022 Aug.

- [11] Tchounwou PB. Perspective on Social and Environmental Determinants of Oral Health. *Int J Environ Res Public Health*. 2021; 18(24): 2-11.
- [12] Guillaume A, Béatrice T-P, Célia B-G, Coline G, Tatiana C, Andre VJ, et al. Oral Health or Rural Cameroonian Children: A Pilot Study in Bamendou. *Children*. 2023; 10(8): 1-10.
- [13] Ogunbodede EO, Kida I A, Madjapa HS, Amedari M, Ehizele A, Mutave R et al. Oral health Inequalities between Rural and Urban populations of the African and Middle East Region. *Adv Dent Res*. 2015; 27(1): 18-25.
- [14] American Dental Association. Toothbrushes [Internet]. 2024 [cited 20 September 2024]. Available from: www.ada.org/resources/ada-library/oral-healthtopics/toothbrushes
- [15] Nguendo-Yongsi B. Patterns, Practices, and Level of Buccodental Hygiene in individuals aged 5 to 17 years in Bafia, Cameroon. *J Community Health Dent*. 2022; 16(1): 9-13.
- [16] Timothy WN, Thomas S. Complications of severe odontologic infections: a review of literature. *Biology*. 2022; 11(12): 1-14.
- [17] Lene MS, Frode S, Jan-Are KJ. Delay of Dental Care: an exploratory study of procrastination, dental attendance, and self-reported oral health. *Dent J*. 2023; 11(2): 1-11.
- [18] Tara R. Pain. Part 1: Introduction to pain. *Dent Update*. 2015; 42(2): 109-12.
- [19] Treede R.D., Rief W., Barke, A., Aziz, Q., Bennett, M. I., Benoliel, R., Cohen, M., Evers, S., Finnerup, N. B., First, M. B., Giamberardino, M. A., Kaasa, S., Kosek, E., Lavand'homme, P., Nicholas, M., Perrot, S., Scholz, J., Schug, S., Smith, B. H., Wang, S.J. (2015). A classification of chronic pain for ICD-11. *Pain*, 156(6), 1003–1007. <https://doi.org/10.1097/j.pain.000000000000160>