

# Knowledge, Attitude and Practices of Health Care Workers towards NOMA in a Tertiary Institution in Northwestern Nigeria

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## ABSTRACT

**Background:** NOMA is a potentially life-threatening necrotizing condition characterized by the destruction of oral and perioral tissues. NOMA is fatal in 90% of cases but the rate is reduced to about 8% with early recognition and treatment.

**Objective:** To evaluate the knowledge, attitude, and practices of health workers towards Noma in a tertiary teaching hospital in north-western Nigeria.

**Methods:** This was a cross-sectional study carried out among health care personnel using a self-administered questionnaire between October 2019 and February 2020. The questionnaire consisted of 20 questions covering the domains of knowledge and, attitude/practices. The total score for each domain was obtained and then categorized as low (less than or equal to 50%), fair (51 to 69%), and good (70% and above).

**Results:** A total of 156 respondents filled and returned the questionnaires. Male respondents constituted 103(66%) as against 53(34%) Female respondents. The age range of respondents was 19 –54 years with a mean±SD of 32.8±6.6 years. Out of 156 respondents, 123(78.8%) were aware of Noma. The total score recorded in both the knowledge and attitude/practice domains were 72.5% and 47.5% respectively.

**Conclusion:** The awareness of Noma among the study population was good. Those that were aware of the disease have good knowledge of it, however, the attitude and practices were low. Therefore, there is a need for continuous medical education among health care workers.

Keywords: Noma, knowledge, attitude. Practice

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## INTRODUCTION

NOMA is a potentially life-threatening necrotizing disease characterized by the destruction of oral and perioral tissues.<sup>1</sup> It is prevalent in poverty-stricken communities markedly along the so-called Noma belt of the world.<sup>2</sup> Precise epidemiological data on Noma are lacking globally but recently published articles reported a global incidence of 30,000 to 40,000 cases per year with 75 percent in sub-Saharan Africa.<sup>3-4</sup> The data provided by the foreign non-governmental organization on the incidence of Noma in Nigeria during the last two decades revealed a rate of 0.8 to 6.4 cases in 1000 children.<sup>5</sup> Furthermore, Seidu and Co-workers reported a prevalence of 8.3 cases per 100,000 population.<sup>5</sup> A combination of different factors leads to its development with poverty being the most implicated.<sup>6,7</sup> Other factors such as poor oral hygiene, malnutrition, measles, and malaria are also implicated.<sup>8,9</sup> In the absence of any intervention, Noma is fatal in up to 90% of cases due to the sequelae of sepsis that ensues.<sup>2</sup> This rate is reduced to about 8% if prompt and appropriate treatment is instituted.<sup>2</sup> Noma is a disease that starts as acute and progresses in stages.<sup>10</sup> World Health Organization recognizes six stages which include; simple gingivitis (stage 0), acute necrotizing ulcerative gingivitis (stage 1), facial swelling/edema (stage 2), gangrene (stage 3), scarring (stage 4), and, sequelae (stage 5).<sup>11</sup> The survivors of the acute stage of the disease present with severe facial scarification and disfigurement, trismus, and severe malocclusion being described as the face of poverty.<sup>12</sup> Early diagnosis can prevent the progression of the disease to the destructive stage.<sup>13</sup> The role of early detection and intervention in reducing mortality from Noma cannot be overemphasized. Management of Noma is multidisciplinary as it requires intervention from various cadres such as dentists, nurses, maxillofacial surgeons, plastic surgeons, nutritionists, and haematologists among others.<sup>14</sup> It is therefore important that all cadres of health workers in Noma zones should be aware of this disease, and should be able to institute emergency treatments where needed and make prompt and appropriate referrals. This may systematically reduce disease morbidity and mortality.

The objective of this study was to evaluate the knowledge, attitude, and practice of healthcare workers regarding Noma disease among healthcare workers.

## MATERIALS AND METHODS

A cross-sectional study was carried out using a self-administered questionnaire between October 2019

and February 2020. The questionnaire was designed to evaluate the knowledge and attitude/practices among health care workers in Usmanu Danfodiyo University Teaching Hospital (UDUTH) towards Noma disease. The Usmanu Danfodiyo University Teaching Hospital, located about 5km from Noma Children Hospital, is a 1000 beds capacity tertiary institution with specialist training in over 30 departments across medicine, surgery, and dentistry.<sup>15</sup> Ethical approval from the institution's research and ethics committee. The detail of the study was explained to the respondents and only those who gave their consent to participate were selected. Health care workers were categorized into different groups based on their cadres and then a simple random sampling technique was used to select respondents from each cadre. The identity of the respondents was preserved to maintain confidentiality. To ensure the validity of the questionnaire, copies of the questionnaire were sent to two experts in the management of Noma. The validators examined both the content and language. The reliability of the questionnaires was determined through pre-tests. The questionnaire for this study was tested on five randomly selected medical doctors, dentists, and nurses.

The questionnaire was divided into 2 domains namely: the knowledge domain and the attitude/practice domain. Each domain consisted of 10 questions and respondents were asked to mark their responses against what they felt among **Yes, No** and **I do not know** to be the appropriate answers on the questionnaire sheet each correct answer in the questionnaire was scored 1 mark while a wrong or I do not know answer scored 0 mark. The knowledge and attitude/practice domains had a maximum of 10 marks respectively for each respondent. Possible scores ranged from 0 to 20 per respondent and a total score of 1230 marks (100%) for all the responses in each domain. The total scores of all the respondents were then graded as low (less than or equals to 50%), fair (51 to 69%), and good (70% and above) for each domain.

The data were analysed by using IBM SPSS software version 20.

## RESULTS

### Socioeconomic status of the respondents

A total of 156 respondents appropriately filled and returned the questionnaires. Male respondents constituted 103(66%) as against 53(34%) Female respondents (table 1). The age range of the respondents was 19 - 54 years with a mean±SD of 32.8±6.6 years and this was also categorized

(Table1). The respondents in this study were categorized into doctors, dental auxiliaries, nurses and others (figure 1).

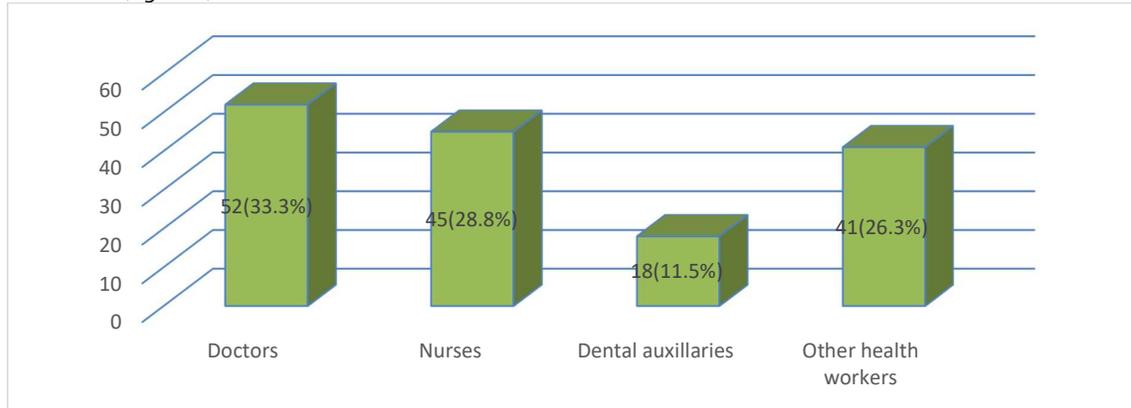


Figure 1: Distribution of health care professionals among the study population

Table1: Socioeconomic status of the respondents in the study

Socio-demographic status	Frequency
<b>Gender</b>	
Male	103(66%)
Female	53(34%)
Total =156(100%)	
<b>Age group of the respondents</b>	
≤30 years	57(36.5%)
31-40 years	76(48.8%)
>40 years	23(14.7%)
Total =156(100%)	
<b>Profession of the respondents</b>	
Doctors	52(33.3%)
Dental auxiliaries	18(11.5%)
Nurses	45(28.8%)
Other health care workers	41(26.3%)
Total =156(100%)	

**Knowledge of the respondents about the disease**

Out of the 156 respondents, 123(78.8%) were aware of Noma disease and the remaining 33(21.2%) were totally unaware of the disease (Figure 2). Those respondents who claim to have knowledge of Noma (n=123) were tested and the total score in this domain was 72.5 %.

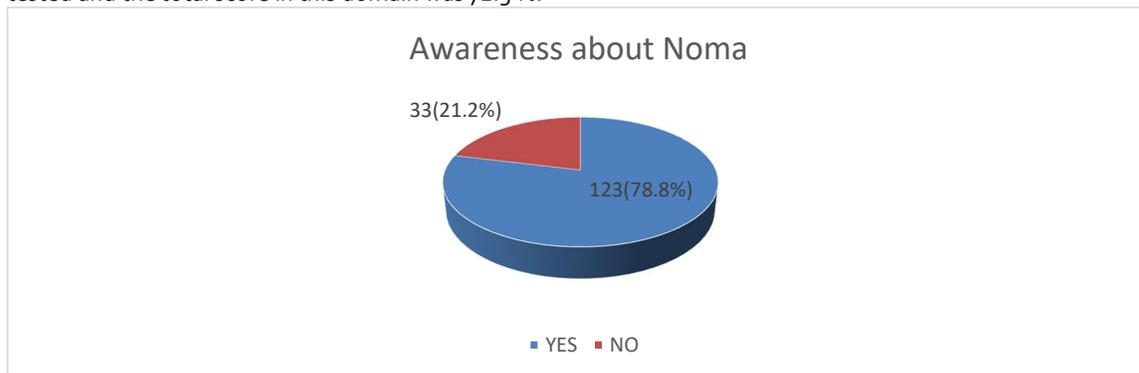


Figure 2: Awareness of Noma disease

**Table2: Answers of the respondents (n=123) claiming to have knowledge of Noma disease**

S/N	QUESTION	CORRECT RESPONSE (TOTAL SCORE)	WRONG RESPONSE (TOTAL SCORE)
1	Noma is also known as cancrum oris	95(77.2%)	28(22.8%)
2	NOMA is caused by bacteria	88(71.5%)	35(28.5%)
3	Is NOMA a communicable disease?	31(25.2%)	92(72.8%)
4	Is NOMA causes by viruses	68(55.3%)	55(44.7%)
5	Is NOMA an emergency in its early stage?	92(74.8%)	31(25.2%)
6	NOMA could be fatal in its acute phase	108(87.8%)	15(12.2%)
7	NOMA is prevalent in sub-Saharan Africa	111(90.2%)	12(9.8%)
8	NOMA affects mostly children	110(89.4%)	13(10.6%)
9	NOMA in its late stage/sequelae is associated with severe disfigurement, trismus and dental anarchy	105(85.4%)	18(14.6%)
10	Poor oral hygiene and malnutrition are predisposing factor for Noma	84(68.3%)	39(31.7%)
<b>Total score for correct answers=892 out of 1230 =72.5%</b>			

**Attitude and practices of the respondents**

Pertinent questions were asked about the handling of patients, prevention and management of NOMA and the average total score in this category was 47.5%. The detail of the scores per response has been depicted in table 3.

**Table 3: Attitude and practices of the respondents (n=123) towards NOMA disease.**

S/N	QUESTION	CORRECT RESPONSE (TOTAL SCORE)	WRONG RESPONSE (TOTAL SCORE)
1	The diagnosis/identification of NOMA is mainly clinical	49(39.9%)	74(60.1%)
2	The diagnosis/identification of Noma is mainly radiological	66(53.7%)	57(46.3%)
3	Vitamin D is the mainstay in the treatment of NOMA	26(21.1%)	97(78.9%)
4	Oral hygiene practice, such as proper tooth brushing is an important preventive aspect of NOMA	60(49.9%)	63(51.2%)
5	Early detection and treatment of necrotising gingivitis and stomatitis in children can prevent the progression of NOMA	93(75.6%)	30(24.4%)
6	NOMA is treated with antibiotics as one of the modalities	46(37.4%)	77(62.6%)
7	Antiviral is the mainstay in the treatment of NOMA	23(18.7%)	100(81.3%)
8	Debridement is one of the treatment modalities for NOMA	21(17.1%)	102(82.9%)
9	Would you advise high protein diet in children as one of the strategies in NOMA prevention	104(84.6%)	19(15.4%)
10	Upon contact with a case of NOMA, would you refer patient to dentist/ maxillofacial surgeon?	96(78%)	27(22%)
<b>Total score for correct answers=584 out of 1230 =47.5%</b>			

**Table 4: Overall KAP score grading**

Domain	Percentage total score	Grading
1. Knowledge domain	72.5%	Good
2. Attitude and practice domain	47.5%	Low

## DISCUSSION

This study explores the knowledge, attitude, and practices of health care workers towards Noma disease in the Noma endemic region. Health care workers of various cadres are expected to be well equipped with the basic knowledge of diseases, especially those conditions requiring a multidisciplinary approach in their management.<sup>16</sup> Noma is being managed in our climes by a team consisting of dentists, oral and maxillofacial surgeons, dental therapists, plastic surgeons, paediatricians, paediatric surgeons, nurses, nutritionists, and, physiotherapist among other specialties. This study categorized all the cadres of the respondents into doctors, dental auxiliaries, nurses, and others. The awareness of health care workers used as the study population was good (78.8%). Those who are aware of the disease also have good knowledge (72.5%). This is contrary to the study by Matilda et al.<sup>17</sup> in Zambia and Louise et al.<sup>18</sup> in Burkina Faso. The good knowledge of Noma reported in our study was likely because the tertiary institution where the study took place is located in the Noma endemic area. Furthermore, it is located about 5km from the Noma Children Hospital which is the national referral centre for Noma that caters to the 36 states of Nigeria as well as neighbouring countries like the Niger republic and the republic of Benin. This could also be attributed to the high prevalence of Noma in our region considering the data provided by the foreign non-governmental organization on the incidence of Noma in North-western Nigeria during the last two decades. This data revealed a rate of 0.8 to 6.4 cases in 1000 children.<sup>19</sup>

Considering the importance of early intervention and the potentially life-threatening nature of the acute phase of Noma, the response gotten was favourable. This is because when the respondents were asked whether Noma is an emergency in its acute phase, the response recorded was good (74.8%), and also 87.8% knew that Noma is fatal in the acute phase. However, the score in the domain of attitude and practices was low with only 47.5% of the health care workers responding favourably to the questions asked. Less than 50% of responses were gotten when the respondents were asked questions related to clinical diagnosis, use of antibiotics, and oral hygiene practices in the management of Noma. This finding is similar to the finding of Louise et al.<sup>21</sup> where they recorded lower response to practices and competence of health care workers in their study to

assess knowledge and practice competence of Noma among primary health care workers in Burkina Faso. The dentist, maxillofacial surgeons, and, plastic surgeons are the three main cadres of health care workers majorly involved in the management of Noma in our setting. This could be the reason for the lower response in the practice domain of this study. When specifically asked about the referral, 78% of respondents would refer cases of Noma to the dentist or maxillofacial surgeon while about 22% of respondents were unsure of where to refer such patients to. This score is an advantage and it signifies the need for education and further training of health workers for better detection skills to make an appropriate referral of patients with Noma. Challacombe et al.,<sup>18</sup> advocate the need for educating the health care workers at the primary healthcare level. Because most of the cases of Noma come from rural areas. Educating the health care workers at the primary level will have a positive impact in terms of prevention, early detection, and appropriate referral. Health care workers at this level should be well equipped with knowledge of oral hygiene practices such as scaling and polishing, the ability to demonstrate proper brushing techniques to the parents as well as older children, treatment of simple gingivitis, and the importance of a balanced diet. The incorporation of trained oral health care workers at this level may also contribute to the improvement in the overall attitude and practices towards Noma.

## CONCLUSION

Noma is a rapidly progressing infection that mostly affects children in areas with limited access to quality healthcare. The awareness of Noma among the study population was good and those aware of the disease have good knowledge about it, but the attitude and practices were low. The good knowledge is possibly due to the endemicity of Noma in the research region. There is a need for continuous medical education among various healthcare workers to improve the attitude and practices toward Noma. Similar studies are recommended to be carried out among the general public in order to sensitize the community toward the prevention and eradication of this disease.

### Source of Support

Nil

### Conflict of interest

None declared

REFERENCES

1. Tempest MN. Cancrum oris. *Br J Surg.* 1966; 53: 949–69
2. Mujtaba B, Chimezie CB, Adebayo AI et al. Clinico-Pathological Analysis of Osteomyelitis in Cancrum Oris (Noma) Patients Seen in Noma Children Hospital, Northwest Nigeria. *Nig J Dent Res.* 2022; 7:29-34
3. Fieger A, Marck KW, Busch R, Schmdt A. An estimation of the incidence of noma in north-west Nigeria. *Trop Med Int Health.* 2003;8:402–407
4. Srour ML, Marck K, Baratti-Mayer D. Noma: overview of a neglected disease and human rights violation. *Am J Trop Med Hyg.* 2017; 96: 268–274.
5. Bello SA, Adeoye JA, Oketade I, Akadiri OA. Estimated incidence and Prevalence of noma in north central Nigeria: A retrospective study. *PLoS Negl Trop Dis.* 2018; 13(7):e0007574
6. Enwonwu CO, Falkler WA, Phillips RS. Noma (cancrum oris). *Lancet.* 2006; 368:147–156.
7. Ogbureke KU, Ogbureke EI. NOMA: a preventable “scourge” of African children. *Open Dent J.* 2010; 4:201–206.
8. Ashok N, Tarakji B, Darwish S, Rodrigues JC, Altamimi MA. A review on noma: a recent update. *Glob J Health Sci.* 2015; 8:53.
9. Baratti-Mayer D, Gayet-Ageron A, Hugonnet S et al. Risk factors for Noma disease: A 6-year, prospective, matched case-control study in Niger. *Lancet Glob Health* 2013;1: e87-96.
10. Tonna JE, Lewin MR, Mensh B. A case and review of noma. *PLoS Negl Trop Dis.* 2010; 4: e869.
11. Brattström-Stolta L, Funka T, Siéb A, Ndiayeca C, Alfvéna T. Noma—knowledge and practice competence among primary healthcare workers: a cross-sectional study in Burkina Faso. *Int Health* 2019; 11: 290–296
12. Enwonwu CO. Noma: A neglected scourge of children in sub-Saharan Africa. *Bull World Health Organ.* 1995; 73:541-5.
13. Adeola AA, Obiadazie A.C. Protocol for managing acute Cancrum oris in Children; An experience in five cases. *Afr J pediatr Surg.* 2009; 6:77-81
14. Ibikunle AA, Semiyu AA, Taiwo AO. Management of 159 cases of acute cancrum oris: Our experience at the Noma children hospital, Sokoto. *Arch Med Health Sci.* 2017; 5:172-176.
15. "Usmanu Danfodiyo University | university, Sokoto, Nigeria". *Encyclopedia Britannica.* Retrieved 2021-03-09.
16. Adeola DS, Eguma SA, Ononiwu CN. Cancrum oris among Nigerian children. *Niger J Surg Res.* 2004; 6:1-2.
17. Mathilda A, Funk T, Marimo C, Ndiaye C, Alfvén T. Management of noma: practice competence and knowledge among healthcare workers in a rural district of Zambia, *Global Health Action.* 2017; 10:1, 1340253
18. Challacombe S, Chidzonga M, Glick M, et al. Global oral health inequalities oral infections—challenges and approaches. *Adv Dent Res.* 2011; 23: 27–23

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