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RESEARCH ARTICLE

Community Awareness and Perceptions about Buruli Ulcers

Onwuka C.D[1*] | Oparaocha E.T.[2] | Nwoke, E.A[2] | Onwuka, O.C.[3]

[1]Department of Environmental and Applied Biology, Imo State University, Owerri

[2]Department of Public Health, School of Health Technology, Federal University of Technology Owerri, Nigeria

[3]Department of Microbiology, Imo State University, Owerri, Nigeria

Abstract

The goal of the research was to determine the knowledge and perceptions of the community about Buruli ulcer (BU) and how to prevent Buruli ulcer in Owerri, South-Eastern, Nigeria. The survey questionnaire was used as a data collection method to request information on community understanding and community views of Buruli ulcer. Systematic sampling to select 600 participants for the study was used in the selection of participants for the group survey. Standard bacteriological and physical examination techniques were used to confirm Buruli ulcer cases. The research revealed a high level of awareness in the selected endemic communities (96.7%) about Buruli ulcer. However, patients with Buruli ulcer were considered to be people who were bewitched (48.3%). Others (14.3%) blamed them as individuals who did not take good care of themselves, while others (21.7%) found individuals afflicted with Buruli ulcer to have natural wounds. Further findings revealed two causes of Buruli Ulcer, natural causes (25.0%), and supernatural causes (63.3%). It was observed that going to the hospital is synonymous with an illness that is perceived to be triggered by natural variables, whereas a conventional healer would treat an illness that is perceived to have been induced by sorcery to combat the sorcery. The result also indicates that while there was a high awareness among community members in the study area of signs and symptoms of Buruli ulcer, their understandings and perceptions of its causative factors differed from those of biomedical understandings. Based on the results of the study, it is recommended that community outreach and education on the treatment and management of Buruli ulcer should be continued on a sustainable basis in the endemic communities.

Keywords: Buruli Ulcer, Awareness, Perceptions, Reactions

1 | INTRODUCTION

Background

Buruli ulcer (BU) is an infectious disease caused by ulcerative mycobacterial that is debilitating. *Mycobacterium* ulcerans infection affects the skin, the underlying tissues and even the bones. After *Mycobacterium* tuberculosis (causing tuberculosis) and *Mycobacterium leprae* (causing leprosy), the third most harmful human mycobacterial pathogen is *Mycobacterium* ulcerans. (Amofah, 2002). The mode of transmission is not fully understood although the disease is known to be linked to contaminated water. Areas affected by Buruli ulcer disease are located near stagnant or slow moving waters.

Buruli ulcer is a tropical disease that is often overlooked. It is more common in Africa during the rainy season, and exposure can occur in muddy farming fields. The organism is most likely spread by skin trauma (Kumar, 2015), (Huang, 2014). Insects may also play a role in some transmission foci, but not in all. While water insects (Naucoris and Belostoma spp.) have been linked to infection transmission in the laboratory, studies in West Africa have cast doubt on their potential as vectors (Zogo, 2015). Positive polymerases chain reaction signals have been found in salt marsh mosquitos in Australia (Johnson, 2007). Aquatic species, as intermediate hosts, can also play a role. Amoeba has also been linked to transmission, but their impact is small. Transmission from one individual to another is extremely uncommon.

The major burden of the disease is in West Africa, where almost every country, particularly along the Gulf of Guinea, has reported a growing number of cases. In Nigeria, Benin, Cote d'Ivoire, Ghana, Guinea, Liberia, Sierra Leone and Togo, the disease is actually endemic (WHO, 2006). It affects all ages and genders, but most cases occur in children under 15 years of age. There is not a significantly different infection rate between males and females.

Late disease diagnosis, lack of knowledge of disease etiology, geographic exposure, and lack of services, superstitious beliefs, and stigma are proven contributing factors for the Buruli ulcer outbreak. Papules, nodules, plaques, ulcers, and oedematous regions of the skin are some of the symptoms of the disease. Buruli ulcers usually begin as a non-painful swelling (nodules). It may also show up as a big, painless plaque or a diffuse, painless swelling of the legs, arms, or face at first (oedema). The mycolactone toxin's local immuno suppressive properties enable the disease to develop without pain or fever. Without treatment, or sometimes during antibiotic treatment, nodules, plaques, or oedema can ulcerate in four weeks, leaving the classic undermined borders. Bones are sometimes affected, resulting in severe deformities (WHO, 2016). Undermining margins, a white cotton wool-like texture, and thickening and darkening of the skin around the lesions are all characteristics of a buruli ulcer (WHO, 2016). Two stages of the BU disease were observed; the pre-ulcer stage and the ulcer stage. The highest occurrence of symptom onset occurred in September and October (maximum rainy season) and a marginal highest in May and June (Amofa, 1993)

Several studies on Buruli ulcer have examined socio-cultural aspects of the disorder, including views of causality, care behaviors, and hospitalized patients' economic burden (Asiedu & Etuaful, 1998; Adamba & Owus, 2011; Ahorlu, 2013; Koka, 2016), and prevalent and perceptions in the management of buruli ulcer (Udujih, 2020) . Most of these research however, appear to focus on the attitudes, expectations and behaviors of the affected people related to Buruli ulcer, as well as the socio-economic cost of the disease and how they have influenced early case detection and negative care seeking actions and other monitoring behaviors. Most of these studies advocated the need for intervention in Information, Education and Communication (IEC) to promote early case identification and care on the premise that they will take effective steps to obtain treatment early once individuals acquire awareness.

Supplementary information The online version of this article (xxxxxxxx) contains supplementary material, which is available to authorized users.

Corresponding Author: *Onwuka C.D*
Department of Environmental and Applied Biology, Imo State University, Owerri
Email: dvmoore37@gmail.com

In this regard, Ackumey (2011) said that growing health education and surveillance will raise awareness and facilitate early care. Nevertheless, it has been claimed that "those who do not comply worldwide are the least willing to comply with" social science studies (Paul, 1999) must therefore go beyond the definition of the current problem and conclude that health education will boost the quest for and adherence to care for Buruli ulcer care. Studies have shown that the view of the environment and awareness about the disease has a detrimental effect on patients' health-seeking actions. For this purpose, all knowledge on socio-cultural factors (perception, comprehension and culture of wounds about the disease) is highly important to a better understanding of the disease as a whole and to serve as a useful material for future study and reference for policy-makers, government and non-governmental organizations, World Health Organizations and the Centre for the Control and Prevention of Diseases. The disease is popularly known as "Acha-ere" in Imo State, Nigeria, suggesting ulceration and deteriorating decaying condition.

The choice of this study, Community Knowledge and Perceptions on Buruli Ulcers in Owerri, South-Eastern Nigeria, was therefore informed by the issues mentioned above. The purpose of this study was to determine the knowledge and perceptions of the community regarding Buruli ulcer. Notably, the research was intended to explore the awareness and responses of the population to Buruli ulcer disease and the affected and how to stop it

2 | MATERIALS AND METHODS

2.1 Study Area:

Owerri is the administrative capital of the state of Imo in Nigeria. It is also the largest state city, followed by Orlu and Okigwe as the second and third. Owerri consists of three areas of local government, namely Owerri Municipal, Owerri North, and Owerri West, with coordinates of 5^0 4 8 5^0N 7^0 3 5^0 N. As of 2016, it has an estimated population of about 1,401,873 and is about 100 square kilometers (40 sq mi) in the city. Owerri is bordered by the Otamiri River to the east and the Nworie River to the south. The research area was selected as the research site due to prior notice of Buruli Ulcer disease in the district. 26.40C is the normal temperature. The annual rainfall for the rainy season (April to September) and the dry season (October to March) is 214 to 220 cm.

Owerri City, the capital of Imo State, is a semi-urban town in southern Nigeria that houses more than 50 percent of the population of the state. Some towns have rural characteristics in the Owerri region, while the capital has urban characteristics, and most of the towns are rural. There is significant poverty in most rural communities, which has affected the infrastructural growth of the region. Good roads, water supplied by pipes, and electricity are lacking in most communities. The majority of roads, especially during the rainy seasons, are inaccessible. The urban community has access to clean water supplied by water vendors from water boards and boreholes, while the remaining people mainly obtain water from rural communities from reservoirs, streams, wells, and ponds. Most citizens live in the capital city.

The people are primarily Christian Igbos, whose work includes agriculture, trade, civil service, etc. For their socio-economic activities, such as dish-washing, laundry, and drinking water, the majority of state residents use the Nwaorie River and the Otta-Miri River, and most are involved in fishing, rice, yam, cotton, melon, and cassava farming, etc.

In the state capital, the state has a public hospital (Federal Medical Centre) that acts as a referral center for other state hospitals and clinics. There are private hospitals and clinics, apart from the state-owned Specialist Hospital. Two cluster health centers coordinated the activities of other health centers in the risk-endemic LGAs. These are the Ohaji/ Egbema LGA Umuagwo Health Centre and the Oguta LGA Orsu-Obodo Health Centre. Including the German Association for Leprosy and Tuberculosis Relief (GLRA), which serves as a rehabilitation and referral center for tuberculosis, Buruli ulcer, and leprosy prevention in the Imo State, such health centers provide patients with free diagnosis and treatment. Around 70% of roads are in terrible shape, making it very difficult to access both health care and socio-economic activities. As a consequence, many sick participants seek

home care drugs from home-grown dealers of herbal medicine, while others are the first treatment choice to patronize drug stores and itinerant drug vendors.

2.2 STUDY POPULATION AND SAMPLING

Community members, Buruli ulcer patients, their caregivers, and former Buruli ulcer patients in the research region were part of the population for the study. A color atlas of Buruli ulcer images from WHO documents was mounted at the health centers and traditional healing centers to serve as guide in the identification of similar lesions presenting to the facilities.

To obtain data from the sampled group participants, survey questionnaires were used. Systematic sampling was used to pick compounds from potential participants when choosing participants for the group survey. In the thirty (30) most endemic communities of Buruli ulcer, the compounds were described. Using the method of systematically selecting compounds, the compounds were chosen for the survey in the selected communities. Thus, in all the selected communities, there were 6000 compounds. Thus, 6000 was broken down by the sample size of 600 provided 10. For the study, every tenth (10) compound was visited. Two respondents were interviewed within a given compound.

Adults in a given compound who were 18 years and above were the eligibility criterion for the survey. The projected population was 33,600 for the selected communities. For the community survey, a sample size of 580 was created using Epi-Info 7 software, with a population size of 33600. However, questionnaires were administered to 600 participants to make up for contingencies and non-response.

2.3 Study Design and Data Collection

This was a cross-sectional study to evaluate community understanding and perceptions of Buruli ulcer disease in the Owerri zone between September 2018 and August 2019. In the Owerri district, survey questionnaire interviews were conducted with 600 community participants. The survey questionnaire was pre-tested in Amaraku, a community that is not part of the Owerri zone, before the main data collection. In all, thirty group members were chosen and interviewed randomly. This allowed the researcher, before the key data collection, to validate the tools. The questionnaire covered the following topics: demographic details, awareness of Buruli Ulcers, community perception and causes of Buruli ulcers, and community opinions on community Buruli ulcer prevention. All questionnaires were administered by qualified research assistants and community-based voluntary surveillance to study participants who are familiar with the field of study.

2.4 Data Analysis

For analyzing the results, Epi-Info 7 was used. By conducting tabulations and cross-tabulations, a simple statistical analysis of variables of interest was carried out. The related tabulations yielded frequencies that were used to characterize the variables' basic summaries. For comparison between variables, the cross-tabulations made it possible.

For the testing of correlations between variables, chi-squares and P-values were collected.

The p-value was considered to be meaningful at < 0.05.

2.5 Ethical Consideration

The Ethical Investigation, the Department of Animal and Environmental Biology, the Faculty of Science, Imo State University Owerri (IMSU), and the Ministry of Health of the State of Imo received ethical clearance. The written or verbal consent of all the study participants was obtained after brief enlightenment on the study intent. Ethical norms of confidentiality and privacy and privileges not mentioned in the study were also guaranteed to the respondents. Participants were made aware that their participation in the study was voluntary and that their failure to participate would not have an effect on their access to the services provided by the health facility. There were no monetary inducements to entice respondents to participate in the research.

3 | RESULTS

3.1 Demographic Status of Participants

Of the 600 participants were females 286 (47.7%) and 314 (52.3%) were males. 220(36.7%) of the

participants were substantially (P<0.05) higher in the age group between 39 and 48 years old. Out of the participants, the bulk of 303 (50.5%) had no formal schooling. Further review of demographic data showed that a high number of 296 (49.3%) participants were engaged in all kinds of trading (Table 1).

3.2. Knowledge of Buruli Ulcers

The findings in Table 2 showed a high level of awareness in the selected endemic communities regarding Buruli ulcer. This discovery came to light when participants were asked if they knew of the disease that causes plaques, nodules, blisters, etc. 580 (96.7%) of the 600 respondents said they had learned of Buruli ulcer. Participants were asked where they got to know about the disease to validate their knowledge about the disease, and most 380 (63.3%) of participants learned about Buruli ulcer in their communities; 100 (16.7%) of participants said they either saw any of the patients with Buruli ulcer before infection or they were infected before; Another 34 (5.7%) said they heard from media reports and conversations about Buruli ulcer, while 50 (8.3%) said they heard from the hospital about it. (Table2).

3.3 Community Ideas about Buruli Ulcer Infection

Before the data collection for the present study, participants were asked whether they knew of any person infected with Buruli ulcer in their communities and the majority 540(90%) responded in the affirmative. 500(83.3%) of participants said painless itchy boils were consistent with the early signs and symptoms concerning the signs and symptoms of Buruli ulcer infection, while 100(16.7%) reported rashes as signs of infection.

Participants identified two major causes of Buruli ulcer; 150(25.0%) natural causes and 380 (63.3%) supernatural causes. (Table3). 70(11.6%) of them, however, listed both natural and supernatural causes. There was a major difference between 314 (52.3%) males and 286 (47.7%) females, with males more likely than females to identify natural causes of Buruli ulcer (P<0.09).

There was a substantial difference between those with no education 303(50.5%) and those with at least primary education 167(27.8%) in terms of education level and the attribution of the cause of Buruli ulcer infection. Significantly more participants with at least primary education 460(76.7%) were more likely than those without education 140(23.3%) (P < 0.003) to say that Buruli ulcer is caused by both natural and supernatural causes

3.4 Community Perceptions about Buruli Ulcer Wounds

Participants identified various causes of wounds. plaques 150 (25.0%), injuries-both domestic and motor injuries 130(21.7%), drop 110(18.3%) and insect bites 125(20.8%) among others 85(14.2%). These were; Asked how wounds are categorized in the cultures, the majority of 380 (63.3%) of the participants said wounds are categorized by supernatural (bewitched) and normal (ordinary) causes, 150 (25.0%) said wounds are categorized by how extreme they are, Therefore, more serious or extreme wounds that do not heal easily have been attributed to supernatural causes. Also, 70(11.7%) said the categorization is based on the way the wound appears, but supernatural reasons have been linked to wounds that look bad and smell offensive. Categorization of wounds helps to know how to manage/treat a specific wound, according to participants.

Participants were asked to identify in their societies the kind of wounds they would call Buruli ulcer. 420(70%) described Buruli ulcers as wounds that do not heal easily or at all, whereas 180(70%) described wounds from Buruli ulcers as wounds from cotton wool. Two primary reasons why they thought Buruli ulcer wounds were different from other wounds were also given by participants. Although 410 (68.3%) of participants said the difference is that, compared to other wounds, Buruli ulcer wounds do not heal quickly and smell unpleasant, 190 (31.7%) said the difference is that Buruli ulcer wounds have cotton skin-like skin (necrotic tissue) edges that are not found in other wounds.

3.5 Community Perceptions and Reactions towards Buruli Ulcer Patients

Buruli ulcer patients that were viewed as individuals who were bewitched are 290(48.3%). 130 (21.7%) criticized them as individuals who did not take good care of themselves, while another 86 (14.3%)

TABLE 1: Demographic Status of Participants

CHARACTERISTICS	Frequency N = 600	Percentage (%)
SEX GROUP		
FEMALE	286	57.7
MALE	314	52.3
AGE GROUP		
18 – 28	16	2.7
29 – 38	120	20.0
39 - 48	220	36.7
49 - 58	124	20.7
59 - 68	84	14.0
68 & Above	36	6.0
EDUCATIONAL STATUS		
No Education	303	50.5
Primary school	75	12.5
Junior High School	167	27.8
Senior High School	40	6.7
Technical	10	1.7
Tertiary	5	0.8
RELIGION		
Christianity	540	49.3
Islam	10	1.7
Traditionalist	40	6.7
Others	10	1.7
OCCUPATIONS		
Trade	296	49.3
Farming	134	22.3
Fishing	59	9.8
Sand quarry/ Laborers	41	6.8
Civil Servants	24	4.0
Unemployed	28	4.7
Others	18	3.0

saw Buruli ulcer affected individuals who suffered wounds. Interestingly, while 54(9%) of the participants saw patients with Buruli ulcer as those bitten by insects, 40(6.7%) saw them in the group as normal sick people. How Buruli ulcer patients were viewed in the study area did not have a gender difference. Participants in the age group 49 and above years, however, 244(40.7%) were more likely than those aged 18-48 years to view Buruli ulcer infected individuals as normal sick individuals 356(59.3%)($P<0.009$).

Participants aged 18-28 years 16 (2.7%) were more likely than those aged 29-38 years 120 (20%) to see Buruli ulcer infected individuals as those bewitched, on the other hand. In terms of how they view Buruli ulcer patients in the study field, there was no

TABLE 2: Knowledge of Buruli Ulcers

CHARACTERISTICS	FREQUENCY N = 600	PERCENTAGE (%)
Knowledge of Buruli Ulcer (Blisters, Plagues)		
YES	580	96.7
Sources of information		
Media	34	5.7
Hospital/ Clinics	50	8.3
Community Members	380	63.3
Victims	100	16.7
Rumors	16	2.7

TABLE 3: Community Perceptions towards Buruli Ulcer Participants

Characteristics	FREQUENCY N = 600	PERCENTAGE (%)
Bewitched	290	48.3
Lack of Hygiene	130	21.7
Sustained Wounds	86	14.3
Insects bites	54	9
Normal Sick People	40	6.7

distinction between the educated and non-educated. Participants have reported different reactions in Buruli ulcer patients. Further findings showed that infection with Buruli ulcer does not elicit sympathy from some community members as; 100 (16.7%) of the respondents said they would stay away from a person infected with Buruli ulcer, 200(33.3%) said they would respond to patients with Buruli ulcer in a normal way, but with caution, while 300(50%) said they would get closer without hesitation to Buruli ulcer infected individuals. Asked if they would communicate in terms of establishing relationships with Buruli ulcer infected people, similar proportions of participants said they would 350 (58.3%) and not 250 (41.7). However, 250(41.7%) of the participants said that Buruli ulcer is contagious when it comes to its infectiousness, so it could be transmitted from one person to another with 290(48.3%) insisting that it is not contagious, so it could not be transmitted from one person to the other, while 60(10%) said that they did not know whether Buruli ulcer is infectious or not.

Of the 600 respondents, 530 (88.3%) said that Buruli ulcer is a major health concern. This stance has been backed by a variety of factors, including the fact that the mode of transmission of Buruli ulcer is unclear, that there are no specific means of preventing infection, and that the disease also affects children in the study area. Nonetheless, a minority of 70(11.7%) of the respondents said that Buruli ulcer is no longer a major health issue in the study region because the educational initiatives taking place in the communities are not popular these days.

Total number of 488(81.3%) said that the disease is curable on the issue of whether Buruli ulcer is curable or not, while 112(18.7 %) said it is not. 270 (45%) said it can be cured by biomedical treatment for those who said Buruli ulcer was curable, 180 (30%) said it can be cured by conventional healers, and 150 (25%) said it can be cured using both biomedical and conventional treatments. 260 (43.3%) of them said it is so because it is a disease induced by being cursed, 240 (40%) said it is so because the disease is caused by supernatural

means and 100 (16.7%) said they did not know why it could not be healed, for the participants who said Buruli ulcer is not curable. It is important to remember that there is no correlation between the socio-demographic features of Buruli ulcer care and community perceptions.

3.6 Community Views on Buruli Ulcer Prevention

The prevention opinions of participants were strongly rooted in their belief in the causes of Buruli ulcer disease, which could be described as normal and/or supernatural. Different preventive measures of Buruli ulcer were identified in line with these perceived causes and prominent among them were 'clean environment 193(32.2%)' Good hygiene 250(41.7%) and not offending bad people 20 (3.33%)' (Table4).

4 | DISCUSSION

Study results showed that the vast majority of Imo state participants were conscious of Buruli ulcer disease and its presentations. Earlier research in Ghana verified the high level of awareness of Buruli ulcer by community participants, which recorded a high prevalence in the study district that was more than four times the national average (Amofah, 2002). This is in line with previous results recorded from the field of research (Amofah, 2002; Asiedu & Etuaful, 1998; Kargbo-labour, 2010). In their understanding of early signs and symptoms of the disease, which has been identified as either a painless itch or boils or rashes, the thorough knowledge of respondents is also demonstrated. Biomedical knowledge is compatible with these (Portaels, 2009; Elliott, 2010; Nienhuis, 2010).

These results might serve as points of entry for educational messages aimed at early reporting for diagnosis and care to the health facility. However, these results differed from Renzaho's previous work in the Obom Sub-district of Ghana in 2007, where they stated that members of the community had a rather poor understanding of the etiology of the disease, while the disease itself was well known. However, in terms of a case seeking and reporting over time, the shift in the perception of community members can be seen in the light of ongoing connections between formal health systems and populations. As early case identification, diagnosis, and treatment spread across the endemic populations, the early signs and symptoms of the disease have become more common to people (Ahorlu, 2013; Ahorlu, 2014).

The causes of Buruli ulcer disease, both normal and supernatural, have been affected by two key factors. They could cause Buruli ulcers either individually or concurrently. For instance, due to the belief that a witch/wizard and gods might turn themselves into insects and infect a person with a Buruli ulcer, a bite from an insect, which is a natural cause, may also be interpreted as a supernatural cause. Therefore, findings show that while there is a high understanding among community members in Imo State of signs and symptoms of Buruli ulcer, their understandings and perceptions of its causative factors differed from those of the biomedical understandings. Benin has indicated that treatment-seeking behavior can be linked to the interpretation of a patient as to the origin of the disease (Aujoulat, 2003). Hospital treatment is concerned with diseases that are perceived to be triggered by natural causes, whereas a conventional healer would treat diseases that are considered to have been created by sorcery to counteract sorcery (Aujoulat, 2003). This means that individuals in biomedical health facilities will postpone care for the disorder by resorting to self- and conventional treatment choices.

This poses a major public health problem because it eventually leads to chronic sores and extreme deformities leading to disabilities as Buruli ulcer progresses to a category three-level. Therapy becomes very expensive in category three steps, placing a heavy financial strain on individuals, health facilities, and the nation as a whole. Consequently, one of the factors affecting the option of self-medication versus conventional treatment may be the assumption that Buruli ulcer is triggered both by natural versus supernatural factors. This strongly confirms an earlier study performed in Cameroon where this was called double causality by researchers; suggesting disease with both normal and supernatural derivations (Grietens, 2012). Without insight into the mechanism of double causality, the interchangeability and regular compatibility of the two forms

TABLE 4: Community Views on BuruliUlcer Causes and Prevention

Characteristics	Frequency N = 600	Percentage (%)
Causes		
Natural	150	25
Supernatural	380	63.3
Both	70	11.7
Prevention		
Clean Environment	193	32.2
Good Hygiene	250	41.7
Not bathing in the River	50	8.3
Sand Quarry	30	5
BCG Vaccination	41	6.8
Not falling out with bad people	20	3.33
Talisman	16	2.7

FIGURE 1: 1 & 2 Ulcerative legs of participants captured by the researcherduring the study undergoing treatment

of treatment, the complex essence of aetiological values, and insight into decisive factors that affect the choice of treatment, the therapeutic processes of patients cannot be understood. Although the consequences for disease control are seldom taken into account, the importance of double causality with other diseases has been highlighted by different research. (Hausmann- Muela, 1998) illustrated how people in rural Tanzania were well aware that parasites caused malaria. They also believed, however, that during medical diagnosis, these parasites may be mystically ”hidden,” leading to potentially fatal delays in seeking the necessary treatment. Similarly, sorcery may create ”false parasites,” contributing once again to an erroneous diagnosis of delayed care.

Similarly, Thomas (2008) clarified in the South African context that while biomedical narratives on HIV presented details about the virus and how it evolved, they did not give people an explanation of why they first became infected. Thomas (2008) argued that this double causal layer was crucial in understanding people’s experience of the illness and, finally, their experience and response to HIV care. Although some earlier studies by Hausmann-Muela (1998) and Thomas (2008) strongly support findings from Grietens (2012), it is at variance with Stienstra (2002) who attributed the cause of Buruli ulcers to only supernatural factors, particularly witchcrafts. This study reinforced the fact that while formal education extends the reach of people and contributes to a shift in world view, the socio-cultural context and climate have a significant effect on the understanding of people. as well as their explanations of problems.

Participants who had formal schooling are also more likely to attribute both natural and supernatural causes to the cause of Buruli ulcer. The consequence of assuming that Buruli ulcer is caused by both natural and supernatural causes may have consequences for public health as it may impact people’s actions seeking care. Depending on the prevailing attributions made to perceived causes, this may impact early case diagnosis and treatment. It also supports the statement that one is not separated from one’s cultural orientation through education or an occupation (Louw & Pretorius, 1995; Pretorius, 1991; Wessels, 1985; Karim, 2007). In a nutshell, this study demonstrates that Buruli ulcers’ presumed roots frequently had both natural and supernatural causal layers at the same time. For example, while participants sometimes thought that an insect bite

infected them with Buruli ulcers, many of them also claimed that this insect was purposely sent to them through sorcery. As such, attempts to disseminate biomedical reasons for Buruli ulcer, as illustrated in health education messages, may have a detrimental effect on the search for care and postpone care; but this is not always the case because natural aetiologies can include additional mystical elements (Grietens, 2012)

A combination of different occurrences and experiences, whether natural or supernatural, helps to form the understanding of each person and also determines their cultural environment, according to Portaels (2001). Therefore, culture is the lens through which people interpret, relate, and react to different phenomena, including health (Wessels, 1985). People in various cultures offer different definitions of meanings to describe or justify disease. Such explanatory models are consistent with the understanding of illness by individuals, derived from ideas, images, values, and behaviors that are profoundly rooted in their culture (Bannerman, 1983; Portaels, 2001). Study results have shown that culture-based interactions, events, and attitudes contribute to wound categorization in line with perceived causes, natural (naturalistic), and supernatural (personalistic). People's role is that the categorization of wounds allows them to know how to manage/treat or heal a specific wound, whether normal or supernatural, depending on its causes. The prolonged existence of the disease and treatment, the complexity of the healing process and recurrence, as observed by Grietens, (2012), can lead to assumptions about potential supernatural intervention even for sufferers who at the onset of symptoms were persuaded of the natural cause of their disease.

Therefore, these experiences can affect the perceptions of participants in the studied area in believing that supernatural forces are causing Buruli ulcer. Its clinical manifestation and the extended duration of healing were a significant distinction that influenced respondents' perceptions of Buruli ulcers from other wounds. Buruli ulcers are defined as having cotton wool (Acha-ere) in them and do not heal easily or at all. Though local, these group explanations are compatible with scientific and microbiological explanations of Buruli ulcer as having necrotic tissue and taking a long time to heal if care is delayed (Van der Werf, 1989; Eddyani, 2009; Nienhuis, 2010). The necrotic tissue is what is called cotton wool by the local people. Study results also indicate that there are different assumptions concerning patients with Buruli ulcer. While a higher percentage of respondents see Buruli ulcer patients as individuals who have been bewitched, a large proportion of them sees patients as individuals who have not taken good care of themselves. These results contradict the study that patients with Buruli ulcer in Ghana were exclusively viewed as witches/wizards or bewitched in their societies (Stienstra, 2002). This points to the fact that ongoing community education projects in endemic communities have a positive effect on people's attitudes and need to be continued (Ahorlu, 2013).

The study showed that some participants did not elicit concern for the condition of the infected individuals because most of them would stay away from a person infected with Buruli ulcers and even those who would engage with the patients said they would do so with caution. These results are similar to what Ghana's Renzaho (2007) said, were more than a third of respondents specifically indicated that a Buruli ulcer patient would not be accepted as a community leader, although they would communicate with them. Such attitudes towards patients will influence conduct seeking care as people with the disease can be inclined to hide their illness from the wider community to prevent prejudice towards them. In endemic communities in Ghana, this also emphasizes the need for continuous health education on Buruli ulcer to demystify it and reduce negative reactions to the infected and affected persons (WHO, 2001; Ackumey, 2011).

Study results indicate that when they are not healthy, most participants will resort to self-medication or visit the drug store. This is similar to the findings of Nsungwa-Sabiiti (2004) on malaria in Uganda, where self-medication was used when signs and symptoms of malaria were observed as the first treatment choice. The majority said that the drug store was their most open distribution point for health services. These results were consistent with similar work done in Cameroon by Grietens (2012), where

several participants were found to resort to self-medication or visit the drug store when unwell. Also, in the rural Democratic Republic of Congo, Kibadi (2009) conducted a study on patients with Buruli ulcer and found that patients waited for an average of two months (wait and see period) after discovering their Buruli ulcer status during which they used their social network to confirm the disease. They resorted to self-medication, and this was typically not administered with allopathic medicines in the form of non-specific antibiotics and anti-inflammatory drugs. These medicines were usually bought from local markets, and local cloth or bandage dressed the wound. The usage of the health center was another possibility. Also, the results of this study were close to what Lönnroth (2001) found in their TB research in Vietnam, where patients in biomedical health facilities resorted to self-care and postponed treatment for TB out of fear of being stigmatized. TB is a typical public health concern that affects the entire population, as with Buruli ulcers, and has thus gained government support in its necessary and successful identification, diagnosis, and treatment (Lönnroth, 2001).

Nevertheless, health-seeking behavior research about TB consistently indicates that patients do not often select a public health care facility for the full period of treatment; they postpone diagnosis and often do not complete the long treatment course required for successful healing (Steen & Mazonde, 1999; Yeboah-Manu, 2013).). Steen and Mazonde (1999) found that 95% of Botswana's TB patients visited a "modern" health facility as a first move, but after initiating modern care, they tended to visit a traditional or faith healer. The reason provided by most of the participants is that they are closer to the herbs to be used for care and drug stores and therefore, easier to access them. This reinforced the results of earlier research that one of the deciding factors in evaluating care options was care within or outside the population of Buruli ulcer patients (Adamba & Owus, 2011; Grietens, 2012).

Most of the participants in this study said that health facilities accessible to them were very far away. Some of the participants state that seeking care at the drug store instead of traveling long distances for care in a health facility is less burdensome, both socially and financially. The findings of this study confirmed the argument made by Ahorlu (2013) and Adamba & Owus (2011) that care outside the community, whether biomedical or traditional, typically put an enormous financial and social burden on the patient and his/her household as it either implied constant travel to obtain treatment or social isolation for the patient who was expected to stay without relative isolation. Such movements also contribute to social isolation for the patient who is forced to live at the place of care without a family to save money on travel costs (Grietens, 2012).

In contrast to the reasons cited in this research for treatment choices resorted to by patients with Buruli ulcer, Awusabo-Asare and Anarfi (1997), in their HIV review, they stated that people affected prefer to avoid other people because of the social meanings given to certain diseases, as they may initially choose home or self-administered treatment strategies that mainly involve the use of herbs, self-medication. This pattern leads to delays in disclosing early attention to the infection, expanding the enormity of coping required.

For individuals and society at large, the health effects of self-medication and the patronization of drug stores are serious. This could lead to drug misuse and violence, especially the patient's antibiotics, as most store attendants are not professionals who could give their customers the right dosage. However, the Ministry of Health Service's involvement of drug store attendants in management, health promotion initiatives, and educating them on prescription use through the control program might help regulate and encourage effective use of drug stores by individuals infected with Buruli ulcer.

The results of this study on community views on the prevention of Buruli ulcer fit into what Seijas (1973) described as the etiology of disease as personalistic and naturalistic views. A personalistic system is one in which the successful, purposeful action of a sensible entity, who may be a supernatural being, a non-human being, or a human being, is assumed to trigger the disease. For purposes that affect him alone, the ill person is a victim, the target of violence or retribution explicitly directed towards him or her. Thus, those who hold personalistic views on the causes of

Buruli ulcer disease in this study give suggestions such as people obeying their gods or not offending others as a way of avoiding Buruli ulcer infection. In naturalistic structures, however, the disease is described in impersonal, structural terms that adhere primarily to a model of equilibrium; health prevails when the foolish elements in the body, the heat, the cold, the senses of humor in their natural and social environment are in proper balance with the age and condition of the individual (Seijas, 1973). Therefore, those who hold naturalistic beliefs about the causes of Buruli ulcer often give recommendations such as living in a clean environment or practicing good hygiene as a way of avoiding group infection with Buruli ulcer.

Grietens, (2012) maintained, similar to what was stated in this review, that the two distinctly distinct perceived causes of the disease (natural and supernatural etiologies) are either used interchangeably or connected. This is also in line with Steen and Mazonde's (1999) discovered in their Botswana TB study in which natural and mystical opinions were identified as measures to prevent TB infection. "In Tzintzuntzan, and many other Latin American communities, according to Nurge (1977)," the cautious person in bare feet does not stand on a cold floor," "does not wash hands after whitewashing a wall," "does not go out immediately after using the eyes into the night air. In principle, at least, by not doing or doing such things as indicated by the community members in our research, a hyper-vigilant person should be able to escape almost all illnesses. On the other hand, the supernatural or mystical views of the Buruli ulcer prevention community reflect the personalistic structures where the basic personal health strategy seems to emphasize the "dos," and particularly the need to ensure that one's social networks are kept in good working order with fellow human beings, ancestors, and deities (Seijas, 1973).

Although this means avoiding those actions that are known to arouse anger, "don'ts," it particularly means paying particular attention to the propitiatory practices that are owed to a deity, to show ancestors positively that they have not been overlooked, and to friendly actions to neighbors and fellow community members that remind them that their goodwill is respected. In short, acknowledging major overlaps in the two schemes, the key methods for preserving wellbeing are drastically different. Both involve reflection. Yet time and resources are key ingredients in health maintenance in the personalistic system. The naturalistic understanding of how the mechanism operates and the will to live according to its dictates, on the other hand, is the important thing; it costs very little, either in time or in money (Seijas, 1973). This Seijas (1973) research is consistent with the results of this report on the management and prevention of Ghana's Buruli ulcer.

5 | CONCLUSIONS

This research concludes that in endemic communities of Nigeria, myths and cultural values and traditions may be barriers to the management and control of Buruli ulcers. The results of this study reinforced the need for sustained community education on Buruli ulcer to ensure early case identification, management, and control in the Imo State endemic regions. Therefore, delays in pursuing care may, in some cases, lead to high care costs and longer treatment durations. As a consequence, among Buruli ulcer patients, this will result in deformities and disabilities.

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Conflicts of Interest

The author hereby declares that he has no conflict of interest.

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