Original Research Article

KNOWLEDGE ANDMANAGEMENT OF BURULI ULCER DISEASE: ACASE STUDY AT SEKYERE AFRAM PLAINS DISTRICT OF ASHANTI REGION, GHANA

ABSTRACT

Introduction: The goal of the study was to assess the knowledge and management of Buruli ulcer disease in the SekyereAfram Plains District of Ashanti Region.

Methods: The study used a quantitative study type and cross-sectional study design with a sample size of 251 comprising BuruliUlcer (BU) patients, health workers and community members as study population.The study used a structured questionnaire for the primary data. The questionnaire was used because the respondents were literates and could read and respond to the items without difficulty.Data collected were edited and coded and statistically analyzed using Statistical Package for the Social Sciences(SPSS) version 26 software.Inferential and Descriptive statistics such as frequencies and percentages were used to describe the study variables. Chi-square (p-values) was used and the data were analyzed in tables with significance level set at 0.05.

Results: The results revealed that the patient's knowledge, about BU was 61.9% which was statistically significant (p-value= *<0.001*). It also revealed association between knowledge on Buruli ulcer and demographic characteristics of respondents (*p-value =<0.001*). Relatively colossal number of respondents (81.0%) revealed that they were not an active member of National Health Insurance Scheme (NHIS).**Conclusion:**The study concludes that if health workers are trained on BU and more education is given to the community members on Buruli ulcer disease, their health seeking behaviour would be improved to reduce complications associated with Buruli ulcer disease in the District. The study recommends that Ghana Health Service (GHS) should organize training and refresher courses for health care workers to increase their knowledge on Buruli ulcer.

Keywords: *Buruli Ulcer,Management, Afram Plains, Ashanti*

INTRODUCTION

1.1 Background to the Study

A Global Buruli Ulcer Initiative was launched by the World Health Organization (WHO) [1] in early 1998 as a result of the buruli ulcer illness becoming a public health concern in many nations. Cases have been documented all over the tropical and subtropical world since Mycobacterium ulcerans infection was first described in Australia in 1948 and later known as Buruli ulcer in Uganda. At least 16 of the continent's 46 member nations have reported cases to the WHO, primarily in West Africa and certain regions of Eastern and Central Africa. Mulder et al.'s [2] investigation found no sex-related differences, but according to a different study, prevalence was higher among women than males and among boys than girls [3]. Given that children under the age of 15 account for 70% of cases, age is important to consider [4]. The oldest known instance is 70 years old, and the youngest example is a 6-week-old infant [5]. Buruli ulcer is a serious condition since it is endemic in many nations where 50% or more of the population is under the age of 18 [6]. Due to occupations like farming, the buruli ulcer has been observed in 31 subtropical and tropical locales [7]; [8]. Among the nations represented are Angola, Sri Lanka, Sudan, Suriname, Togo, and Uganda, among others [9]. There have been a few isolated cases found in non-endemic areas of North America and Europe, however these cases have been linked to international travel [10]. In 2018, cases were reported in 14 nations, the most of which are in Africa, where the majority of the disease control efforts have been focused [11]. In the worst cases, Buruli ulcer leaves victims with disfiguring and disabling craters after silently eating through their skin, muscle, and bone [12]. The location of the microorganisms in the environment is uncertain [13]. Although the bacteria are obviously unable to do so on their own, it is still unknown how it enters the body [14].

When serious cases were reported from the Amansie West district of the Ashanti Region in August 2010 [15], Buruli Ulcer was first made public in Ghana in 1993. Although earlier cases were reported from the Densu and Afram plains, Tontokorom was the town most severely affected, per a study [16] and [17]. In Ghana, a nationwide survey conducted in 1999 found 6000 cases and showed that Buruli ulcer was prevalent at the time in all ten regions.

While there were 739 documented instances in 2003, there were 562 new cases reported in the first half of 2018. 30 districts regularly updated the National Control Program on the illness in 2019 [18]. The prevalence rate of active Buruli ulcers in the general population is 20.7 per

100,000 individuals, although it can increase to 150.8 per 100,000 persons [19]. The most affected regions are Ashanti, Central, BrongAhafo, Greater Accra, and Eastern [20]. In terms of Buruli ulcer cases in 2012, Ghana ranked after Cote d'Ivoire as the second most endemic country [21]. Since the buruli ulcer is no longer a major public health concern, obtaining funding from donors is more difficult. This illness, however, primarily affects people who make less than $1 per day [22]. Buruli ulcer manifests itself in regions where environmental disturbance has been severe due to sand and mineral extraction, construction of dams, irrigation, deforestation, and rapid urbanization [23], [24]. According to studies, farming, fishing, bathing, and wading are risk factors for coming into contact with ponds, lakes, rivers, and dams [25]; [26]; [27]. Person-to-person transmission is uncommon or impossible based on epidemiological research [28]; [29]; [30]. It is still unknown how humans are primarily infected by the environment and where the actual reservoirs are. The etiological agent, however, is thought to enter the body through skin injuries or insect bites [31].

Numerous factors, including culture, stigma, and a lack of access to modern healthcare, have been implicated in the decision of Buruli ulcer patients to seek any other form of treatment. Additional variables like the attitude of the medical staff and the distance to the closest medical facility may encourage or discourage Buruli ulcer patients from seeking medical attention [32]. If a sickness carries a stigma, the person may attempt to downplay it and turn to herbalists for support. Lack of understanding of a weird disease is the cause of the choice to either self-medicate or seek the help of conventional healers and spiritualists [33].

The need of early reporting and prompt, proper medical care for nodules is stressed in current case management techniques in order to prevent ulceration and the subsequent debilitating diseases of osteomyelitis, contracture deformities, and impairments [34]. People may be aware of the connection between the Buruli ulcer and the environment in many places, especially rural populations in Africa, while also associating it with witchcraft or other mystical reasons [35]. Many people are compelled to seek out traditional healers as their primary care because of their dual appreciation of the condition and their limited access to orthodox medicine [36]. Herbs and occasionally burning or bleeding are used by traditional healers to treat the physical wound, and confession, ritual purification, and restrictions on food, interpersonal contact, or sex are used to address the disease's spiritual component [37]. People who have Buruli ulcers claim to

experience shame and social stigma, which may have an impact on their relationships, ability to attend school, and likelihood of getting married [38].

A recent WHO report states that there have been 5,076 Buruli ulcer cases reported globally, including Ghana, with Africa being the region most affected. Because of the local immune-suppressive properties of mycolactone, the condition progresses without discomfort or fever, which may help to explain why those who are affected do not often seek therapy right away. But if left untreated, huge ulcers with normal and weakened borders grow [39]. When the bone is injured, serious abnormalities might occur. After lesions heal, scarring may result in decreased limb mobility and other long-lasting impairments in about a quarter of people [40]. In order to improve the management of Buruli ulcer cases in the SekyereAfram Plains District, this study examined both current knowledge and the strategies in place.

According to World Health Organization statistics, the number of suspected Buruli Ulcer cases recorded annually in the world was approximately 5000 instances up until 2010, when it began to decline. By 2016, it had decreased to its lowest point, with only 1961 cases documented. However, the amount of cases increased to 2713 in 2020 [41]. Uncertainty surrounds the causes of the variation. In Africa, West and Central Africa—including Benin, Cameroun, Cote d'Ivoire, the Democratic Republic of the Congo, Ghana, and Nigeria—report the majority of instances. While Cote d'Ivoire used to report the most cases in the world (2,242 cases in 2008), Liberia has only recently begun to report a significant number of suspected cases [42].Over 1,000 cases are typically recorded annually in Ghana, where the majority of cases go unreported [43. In Ghana, cases of Buruli ulcer were reported from about 18 districts in 2016 [44]. Ten districts in the Ashanti region, including SekyereAfram Plains, reported cases of Buruli ulcers [45]. By inference, this indicates that the Buruli ulcer situation in Ghana is grave. Over 60% of all Buruli ulcer cases were found in the Ashanti Region, according to the Ghana Ministry of Health's 2012 annual report. In Ghana, a nationwide search for Buruli ulcer cases yielded 5,619 individuals and 6,332 clinical lesions in varying stages [46]. The overall crude national prevalence rate of active lesions was 20.7 per 100,000, whereas in the area with the highest illness endemicity, the incidence was 150.8 per 100,000. When compared to the regular reporting system, the case search revealed widespread disease and egregious underreporting [47].

One of the poorest districts in the Ashanti Region is SekyereAfram Plains, which lacks the necessary human resources as well as fundamental social services including a functioning health

system. The neighborhood is plagued by a number of Neglected Tropical Diseases (NTDs), including Buruli ulcer, for which the majority of patients arrive at the medical institution late or never at all. Others turn to herbalists, spiritualists, and prayer camps as a result of their lack of understanding of the illness, their poverty, and in some cases, their ignorance.

The primary stakeholders in the management of Buruli ulcer, the medical professionals, also lack the necessary knowledge and experience to manage the condition in addition to the logistical difficulties and infrastructure. The prevention of the advancement of the pre-ulcerative condition will continue to be the mainstay of Buruli ulcer control in the absence of infection prevention techniques [48].

The majority of these BU cases are discovered when the infection has advanced to the ulcerative stage. Due to the nature and onset of the disease, there are explanations for the late reporting to the medical facility. They visited herbalists and spiritualists. Others complain about the absence of healthcare services in their catchment areas, including the logistics of case management and the availability of drugs. Despite receiving free medical care, many affected people in the SekyereAfram Plains endemic areas choose other treatment options over hospital care [49]. Cases will be recorded at late stages if this problem is not corrected, which could result in deformity, permanent impairment, and amputation. Due to lack of information about the illness, sometimes poverty, and ignorance, some BU patients turn to herbalists, spiritualists, and prayer groups. Along with logistical difficulties and a lack of infrastructure, the health staff, who are the primary stakeholders in the management of Buruli ulcer, also lacks the necessary skills and expertise [50]. Therefore, the study investigated how Buruli ulcer disease was understood and treated in the SekyereAfram Plains District of the Ashanti Region.

Despite the fact that the disease has been the subject of numerous studies in a number of endemic nations, little has been done to manage it in rural populations [51]. In addition to providing a critical and analytical perspective for understanding the management and knowledge of Buruli ulcer in the area of study, it is hoped that this study has contributed to the understanding of why people do not seek treatment from healthcare facilities early.

2. METHODS

2.1 Study Area

One of the forty-three (43) administrative Districts in Ghana's Ashanti Region is the SekyereAfram Plains District. Its Drobonso is its capital. In 2012, the district was separated from SekyereKumawu District. SekyereKumawu District borders it on the south; Sekyere Central borders it on the east; and Asante Akim North borders it on the west. A rough estimate puts the district's total land area at 2,450.39 square kilometers. Due to its representation of 14.5% of the region's total land area, the district is now the largest in terms of land area [52]. SekyereAfram Plains includes 134 settlements with a population of 36,937, according to estimates. The district contains nine (9) health facilities, including 3 Community-Based Health Planning and Services (CHPS) complexes, 4 clinics, and 2 health centers. There is no district hospital in the area. There are 8 public facilities and one CHAG (Christian Health Association of Ghana) institution. The majority of cases are directed to the Atebubu Government Hospital in the Bono East Region as well as the Kumawu Polyclinic and Agogo Presbyterian Hospital, both in Ashanti [53]. The majority of the village is a farming one that also produces charcoal.

2.2 Study Population

The target population for the study comprised of Buruli ulcer patients, health workers and some community members at the SekyereAfram Plains District.

2.3 Study Design

A cross-sectional quantitative study was used to explore the knowledge and management of Buruli ulcer disease among the patients, health workers and community members. This design was preferred because of the duration of the study and described what was happening presently as far as Buruli ulcer management was concerned in the district. A questionnaire was administered face-to-face using closed-ended and open-ended questions to obtain meaningful information on the topic at that particular point in time.

2.4Sample Size

Buruli ulcer patients:The SekyereAfram Plains District Buruli ulcer Register 2019-2021 as the main source of data for information on patients currently receiving treatment. The number of Buruli ulcer patients was 42 on the Register. Thus, a census sampling was used to include all the patients.Healthcare Workers:Taro Yamane formula was adopted to estimate the sample size for the health workers,thus:

$$n = \frac{N}{1 + N(e)^2}$$

n- The sample size; *N*- Size of population; *e*- The error of 0.05

With sampling error of 5% and confidence interval of 95%, the calculation for the sample size of 86 healthcare workers in the district equals 71. Proportionate stratified and convenient sampling methods were further used to select 71 health workers from the facilities for the study.

Table 1:Stratified Proportionate Sampling Table for Health Care Workers

Health Facility	No of Healthcare Workers	Sampled
Drobonso GHS Clinic	16	13
Hamidu Clinic	15	13
Anyinofi Health Centre	14	12
Auntie Riek Clinic	14	12
Dawia Health Centre	7	7
Funsua Health Centre	9	7
Seneso CHPS Compound	9	7
Akoma CHPS Compound	9	7
Total	86	71

Table 2: Sample distribution of study respondents

Respondents	Number
Buruli ulcer Patients	42
Health workers	71
Community members	138
Total	251

2.5 Sampling Technique

Stratified and simple random sampling methods were used to select the respondents. After deciding on the number of samples from each stratum, simple random sampling method was used to select the actual respondents. This was done by writing 'yes' and 'no' on pieces of paper. The healthcare workers and the community members who chose 'yes' were included whereas all the patients were included in the study.

2.6 Study Variables

For this study, the researcher attempted to assess the dependent of management of Buruli ulcer disease in the district whilst the independent variables included knowledge, age, sex, educational level and occupation.

2.7 Data Collection Tool and Technique

The study used a structured questionnaire for the primary data. The questionnaire was used because most of the respondents were literates and could read and respond to the items without difficulty. Respondents who were illiterates were assisted by the researcher or an interpreter. The administration mode was face-to-face. Questionnaire was administered either by the researcher or research assistants and lasted for a maximum of 25 minutes. In all there seventeen (17) questions: both open-ended and close-ended questions.Ghana Health Services scale or checklist for the management of Buruli ulcer was used to assess the optimal Buruli ulcer management in the district. The validity and reliability of the questionnaire yielded a total Cronbach Alpha co-efficient of 0.803.In administering the questionnaire for patients, it was done at the health facility as they visited there for their wound care. Those who failed to visit the facility during the period of the study were followed up in their homes with the help of the Community Health Officer (CHO) responsible for the zone. Concerning the community members or relatives, the questionnaire was administered mainly at the community level (household). Patients assisted the Principal Investigator to identify those in the household. For Healthcare workers the questionnaire was administered at the health facility. The languages used were English and Twi. The questionnaire was grouped under the following headings:section A looked at the socio-demographic information, e.g. age, sex, educational level, etc.Section B also dealt with theknowledge on Buruli ulcer. Section C assessedthe availability of drugs and diagnostic materials for BU patients whilst section D presented the capacity of health staff to manage BU disease.

2.8 Pretesting

The questionnaire was pretested at Agogo in the Asante Akim North District of Ashanti Region. Agogo has similar characteristics in terms of socio-economic activities as well as the

management of Buruli ulcer cases where BU Clinics are held on every Wednesday of the week at the Agogo Presbyterian Hospital.The validity and reliability of the questionnaire yielded a total Cronbach Alpha co-efficient of 0.803.The pretesting assisted the Principal Investigator to determine if the respondents would understand the questions during the actual data collection. Essentially it identified some challenges with the data collection instrument and found possible solutions.

2.9 Data management

The data collected were made available to only the members of the research team. Data collected through questionnaire were coded to ensure anonymity and protect the privacy of respondents. The researcher kept records of data, time and place of interview. Respondents'names were not writing but rather they were given number kept in files for every respondent.

2.10 Data Analysis

The data collected were coded, entered and cleaned using Microsoft Excel software and then imported into Statistical Package for the Social Sciences (SPSS) version 26 for analysis. Inferential and Descriptive statistics such as frequencies and percentages were used to describe the variables such as the socio-demographic information and the knowledge level of the participants. Chi-square (p-values) was used and the data wereanalyzed in a tabular form and drawn inferences between the different data sets and established whether the data were mutually exclusive or with some relationship.

3.11 Ethical considerations

Permission wassought from the Ghana Health Service Ethics Review Committee (GHS-ERC) before the study was conducted. A protocol No GHS-ERC 060/05/21 was obtained from the Ethics Review Committee (ERC).Before the study could begin, approval was requested from the SekyereAfram Plains District Health Directorate. Participants were made known that their names or other contact information would not be linked to the data analysis or dissemination of the study's findings under any circumstances. The participants were informed that all of their responses would be kept private both before and after the data collection. Furthermore, participants were told that all data would be stored, analyzed, and reported in codes, and that the respondents' identities would not be revealed. In addition, the participants were given an informed consent sheet with details about their willingness to engage in the study, and they

signed it indicating their acceptance and approval to participate in the study. The participants were informed that participation in the study was completely voluntary and that no one was compelled to do so. They were free to go and there was no prejudice against them at the hospital's service acquisition procedure. The participants in the study were not at risk, but only a portion of their time was required for answering questions, which may have been a source of stress for them.During the interview, each participant was treated individually and kept at a safe distance from the others so they wouldn't hear the dialogue for confidentiality.

3. RESULTS

3.1Demographic Characteristics of Respondents

Table 3: shows the sociodemographic characteristics of the respondents. The majority of the respondents 70 (50.7%) were males from the relative group. More than half of the healthcare workers 57 (80.3%) were within the age range 28-37 years. On marital status, majority of the healthcare workers 36 (50.7%) were married whilst 24 (57.1%) of the patients were single. All the healthcare workers 71 (100%) had tertiary qualification as against 73 (52.9%) relatives who had no formal education. Majority of the respondents from all the groups were Christians with few of them been traditionalists. Almost half of the relatives and the patients 57 (41.3%) and 16 (38.1%)respectively were farmers.

Table 3: Demographic Characteristics of Respondents

Characteristic	Patients F(%)	Relatives F (%)	Health Workers F(%)
Sex			
Male	21(50.0)	70(50.7)	44(62.0)
Female	21(50.0)	68(49.3)	27(38.0)
Age (years)			
Below 18	15 (35.7)	0 (0.0)	0 (0.0)
18 – 27	11 (26.2)	42 (30.4)	4 (5.6)
28 – 37	8 (19.0)	23 (16.7)	57 (80.3)
38 – 47	5 (11.9)	30 (21.7)	10 (14.1)
48 – 57+	3(7.2)	43 (31.2)	0 (0.0)
Marital Status			
Married	14(33.3)	68(49.3)	36(50.7)
Single	24(57.1)	51(37.0)	31(43.7)
Separated/Divorced/Widow	4(9.6)	19(13.8)	4(5.6)
Educational Level			
No formal	16(38.1)	73(52.9)	0(0.0)
Primary	18(42.9)	18(13.0)	0(0.0)
JHS/Middle School	5(11.9)	35(25.3)	0(0.0)
SHS	2(4.8)	10(7.2)	0(0.0)

Tertiary	1(2.4)	2(1.4)	71(100.0)
Religion			
Christian	21(50.0)	80(58.0)	62(87.3)
Islam	18(42.9)	53(38.4)	9(12.7)
Traditional	3(7.1)	5(3.6)	0(0.0)
Main Occupation			
Farmer	16(38.1)	57(41.3)	0(0.0)
Student	15(35.7)	27(19.6)	0(0.0)
Trader	3(7.1)	12(8.7)	0(0.0)
Civil/Public Servant	1(2.3)	5(3.6)	71(100.0)
Artisan	7(14.6)	37(26.8)	0(0.0)

3.2 Analysis of Patients and Family members' Knowledge on Buruli ulcer disease

Table 4 presents results on patients and relative's knowledge on Buruliulcer disease. With respect to patient's knowledge, about 61.9% of the respondents revealed that they have not heard about Buruli ulcer before. Majority of the respondents 64.3% of the debunked the statement "Living near river bodies is the main risk factor associated with Buruli ulcer". Respondents 64.3% opined that they would know if someone has the disease as detailed in table 4.

Table 4: Analysis of Patients and Family members Knowledge on Buruliulcer

Statement	**BU Patient f (%)**	**Relatives f (%)**
Ever heard of Buruli Ulcer		
Yes	16(38.1)	40(29.0)
No	26(61.9)	98(71.0)
A disease that affects skin and bone		
Yes	12(28.6)	39(28.3)
No	30(71.4)	99(71.7)
Is germ the major causative agent of BU?		
Yes	21(50.0)	61(44.2)
No	21(50.0	77(55.8)
Living near river is risk factor for Buruli ulcer		
Yes	15(35.7	44(31.9)
No	27(64.3)	94(68.1)
Would you know if someone has the disease?		
Yes	27(64.3)	75(54.3)
No	15(35.7)	63(45.7)
Did you report your BUto the health facility?		
Yes	16(38.1)	0(0.0)
No	26 (61.9)	0(0.0)

Source: Field Survey, 2021

3.3 Association between Knowledge and Demographic Characteristics of Buruli ulcer patients and Family members

Table 5: reveals the association between knowledge on Buruli ulcer and demographic characteristics of respondents. Knowledge on Buruli ulcer was generally low. However, sex and educational level had statistically significant association with knowledge on Buruli ulcer (χ^2= 41.640; p = <0.001: χ^2= 24.846; p =<0.001). Also, no statistically significant association was found between demographic characteristics (age, marital status, religion, and occupation) and knowledge on Buruli ulcer.

Table 5: Association between Knowledge and Demographic Characteristics of Buruli ulcer patients and Family members

Characteristics	Low Knowledge	High Knowledge	Chi-square value	*Sig. (2-tailed)
Sex			41.640	<0.001*
Male	44(24.5%)	47(26.1%)		
Female	60(33.3%)	29(16.1%)		
Age (yrs.)			5.562	0.474
<18	7(3.8%)	8(4.4%)		
18-27	36(20%)	17(9.4%)		
28-37	19(10.5%)	12(6.6%)		
38-47	18(10%)	17(9.4%)		
48-57	17(9.4%)	8(4.4%)		
58-70	8(4.4%)	9(5.0%)		
>70	2(1.1%)	2(1.1%)		
Marital Status			4.75	0.783
Single	21(11.6%)	54(30%)		
Married	25(13.8%)	58(32.2%)		
Cohabiting	5(2.7%)	17(9.4%)		
Educational Level			24.846	<0.001*
No formal	63(35%)	26(14.4%)		
Primary	24(13.3%)	12(6.6%)		
Middle/JHS	18(10%)	22(12.2%)		
SSS/SHS	2(1.1%)	10(5.5%)		
Tertiary/Higher	0(0.0%)	3(1.6%)		
Religion			4.763	0.092
Christianity	53(29.4%)	48(26.6%)		
Islam	49(27.2%)	22(12.2%)		
Traditional	5(2.7%)	3(1.6%)		
Occupation			4.933	0.294
Farmer	22(12.2%)	51(28.3%)		
Trader	6(3.3%)	17(9.4%)		
Artisan	7(3.8%)	32(17.7%)		
Student	2(1.1%)	1(0.5%)		
Civil/PublicServant	14(7.7%)	28(15.5%)		

3.4 Attitude towards Buruli Ulcer management among patients and relatives

Table 6:displays the results on management Buruli ulcer among patients and relatives. About, 57.1% of the respondents indicated that they dress their wounds on weekly basis. Also, most of the respondents (52.4%) did not receive regular drugs. Almost half of respondents(45.2%) stated that health workers had good attitude towards Buruli ulcer dressing.

Table 6:Attitude towards Buruli Ulcer management

Statement	F / №	%
Frequency of wound dressing?		
Daily	7	16.7
Bi-weekly	11	26.2
Weekly	24	57.1
Regular receipt of drugs?		
Yes	20	47.6
No	22	52.4
Health workers attitude towards wound dressing		
Very Good	12	28.6
Good	19	45.2
Bad	11	26.2
Very Bad	0	0.0

3.5 Capacity of Health Staff to manage Buruli ulcercases

Table 7:displays the results on the management ofBuruli ulcer patients. Most of the respondents (81.0%) revealed that they were not active members of NHIS. Similarly, 81.0% of the respondents indicated that they were not aware of the free treatment of Buruli ulcer.Also, majority of them (78.6%) indicated the health facility as the best place to manage the condition. About, 57.1% of the respondents dressed their wounds on weekly basis. Majority of the respondents (100.0%) disagreed to the statement “Can you afford the cost of transportation to the facility to dress your wound”. In response to how often respondents do receive enabler’s package from the health system, 61.9 % received the package quarterly. Almost half of the respondents (45.2%) stated that health workers had good attitudes towards Buruli ulcer patient.

Table 7: Capacity of Health Staff to manage BU cases

Statement	Frequency	Percent (%)
Have you received refresher training in wound care?		
Yes		
No	71	100.0

Statement	Frequency	Percent (%)
Is intensified BU case screening offered in your facility?		
Yes	71	100.0
No		
Are there adequate BU diagnostic equipment in your facility?		
Yes	21	29.6
No	50	70.4
Loss of patients before completing their BU treatment?		
Yes	71	100.0
No		
Don't know		
If yes, how do you trace defaulters		
Home visit only	56	78.9
CWC & Home visit	13	18.3
Community Outreach	2	2.8
Are BU drugs and dress solution available in your facility?		
Yes		
No	71	100.0
Do you receive incentives in managing BU patients?		
Yes		
No	71	100.0
How often is BU education organized in this facility?		
Not at all	15	21.1
Once in a month	35	49.3
Twice in a month	14	19.7
Above twice in a month	7	9.9

4DISCUSSION

4.1Patients and Family members' Knowledge on Buruli ulcer

The first objective assessed the knowledge level of the respondents on Buruli ulcer. The findings from the study revealed that the knowledge level of patients and family members was generally low. Most of the respondents stated they had never heard of the disease before whilst only 28.4% knew that the disease affects skin and bone. Concerning the etiology of BU, 45.6% averred that BU was caused by germ and 32.6%opined that living near river bodies was a major risk factor associated with the disease. These findings might suggest why there was high prevalence of BU cases in the SekyereAfram Plains District because most people in the area did not know the cause, mode of transmission and the prevention of BU. Also, the low level of knowledge on BU could be as a result of health workers inability to educate the people on the BU. Since mode of transmission is not scientifically clear, individuals need to be told about the risk factors and the various interventions available. This low level of knowledge onBuruli ulcer is in sharp contrast

with a study by [3] where more than two-thirds of adults in Ga West had an awareness of BUD and consider it a major health problem.

However, findings of this study are consistent with [41] in a study at the Ga East District where they asserted that the community members in that locality lacked a better understanding of the causes of the BU disease. Furthermore, the findings are not in line with [35] on the assessment of community knowledge onBuruli ulcer disease, which results showed that only35.0% of the participants had a good knowledge of Buruli ulcer disease. It was concluded that there was poor community knowledge onBuruli ulcer disease in endemic settings of Southern Nigeria which influenced the attitude and perceptions of community members towards persons with Buruli ulcer disease.The inconsistencies in the findings of the various studies and the current one could be due to lack clarity of health workers on Buruli ulcer disease causes and mode of transmission since there are so many myths and misconceptions about Buruli ulcer disease.

The results also revealed some perceptions by patients and family members on Buruli ulcer disease. Some of the respondents attributed Buruli ulcer disease to witchcraft or some magical powers as the cause.This finding supports [34] study inAsutifi South District, that most BU infected people associate the cause of Buruli ulcer disease to witchcraft and other primitive causes, hence, prefer to seek treatment from herbalists or spiritualist rather that hospital health care.Another study by [5]corroborated the findings in this study and identified that although the majority of respondents stated the hospital as the place for appropriate treatment, some BU victims preferred witchdoctors/herbalists andprayers, and considered the hospital as the last option. The similarities in findings could be due to the chronicity of the disease since most of the chronic conditions are associated with witchcraft in most Ghanaian societies.

4.2 Association between knowledge and demographic characteristics of respondents

It was found that sex andeducational level had association with knowledge on Buruli ulcer. However, no association was found between demographic characteristics: age, marital status, religion, and occupation and knowledge on Buruli ulcer. Result concurs with a study [2] who revealed educational status and ethnicity to be independent predictors of knowledge of Buruli ulcer disease. They found that all levels of formal education were predictors of knowledge on BUD. Improved education of community members could contribute to easy dissemination of information. The role of education in improved community knowledge of Buruli ulcer diseasehas been shown by studies in Ghana and Cameroun [1]; [4]; [9]. Education remains a key instrument

in driving social change and helps in changing one's perception about a disease e.g., acceptance of Buruli ulcer disease patients by community members.People with higher education are expected to have increased knowledge in BU and thus influence the use of modern health care, and this study has identified that. Respondents with basic education had low knowledge about Buruli ulcer diseasecompared to people with higher education. This is in linewith a related study which stated that the level of education determines the knowledge level and hence, the treatment option for respondents on Buruli ulcer [6].

However, the findings contradict [10]noting that Buruli ulcer is prevalent in children under the age of 15, in many traditional settings specific age groups (mostly elderly, sometimes children) prefer traditional practitioner consultation, but age in this current study has not been found to be significantly associated with knowledge. This confirms an earlier study that found that age and sex often have a discriminatory function in knowledge and choosing between traditional and modern health care and that the choice of modern services appears to be less dependent on the age of the people affected [17].

Respondents in the current study engaged in different forms of occupation; most of them were farmers. However, it was observed that there was no significant association between the occupation of respondents and their knowledge on Buruli ulcer disease. Buruli ulcer tends to be economic perspective, and it is a consequence of poverty in most of the affected communities, occupation of respondents in most cases determines the income level. The cost of care for patients with Buruli ulcer is heavy especially patients who live far distance away from health care (cost of travelling).This is in support with a study that found that the cost of treatment and management of BU inflicted a very heavy financial burden on poor households than the rich [3].

Furthermore, it was anticipated that Christians and Muslims, based on their religious beliefs, religion should have a positive association with the knowledge on BU, however, this study found that religion was not statistically associated with the knowledgeof the participants on BU. Another study corroborated the findings of this study and identified that although the majority of respondents stated the hospital as the place for appropriate treatment, some BU victims preferred witchdoctors/herbalists andprayers, and considered the hospital as the last optionwhich was not statistically significant [11].

4.3 Availability of drugs and diagnostic materials for Buruli ulcer management

The third objective determinedthe availability of drugs and diagnostic materials for Buruli ulcer disease management. Findings showed that majority of the respondents were inactive members of NHIS and were alsounaware (81.0%) that the cost of treatment of Buruli ulcer was free. Being inactive members of NHIS could negatively impact on their health-seeking behaviour and may be a justification for BU patients opting for self-medication or resorting to herbal remedies. This finding concurs with a study conducted by [15]where they unequivocally stated that 71% of the respondents prefer traditional medicine to orthodox medication.

The National Buruli Ulcer Programme in collaboration with its development partners had removed all bottlenecks associated with BU management and deliberately made the cost of treatment free. The objective was to ensure treatment compliance and improve the management of BU in the country. Although the study showed a colossal (68.2%) failed to report at the health facility, 78% admitted that the health facility could manage their condition better. This has been confirmed in a study which found that access to health services encouraged timely treatment of Buruli ulcer patients [11].

Regarding the frequency of wound dressing and care, the findings revealed that an insignificant number (16.7%) dress their wounds daily, albeit some stated bi-weekly (26.2%) and weekly (57.1%). Wound care and hygiene speed up the healing process and it is imperative to dress the wound daily. The patient might as well prevent secondary infection and protect pre-existing wound. BU patients need to be educated to wear trousers and long-sleeved shirt to also serve as a preventive measure. All the respondents stated emphatically that they were unable to afford the cost of transportation from their place of abode to the health facility. Probably this may be an indication why majority of the respondents could not comply with the daily wound dressing at the health facility. Inability to cope with the daily dressing could be due to the distance to the nearest treatment site is a major determinant of care choice, but this study did not assess that. A similar study found, however, that living near a health facility increases the likelihood of seeking care [17].

The entire treatment of BU is free, however, there are other costs including transport, feeding and the purchase of other drugs to treat other underlining infections, and therefore this makes the cost of treatment a major determinant of the choice of treatment. This study found that most of the respondents could not afford the transportation cost to the health facilities for daily dressing.

This agrees with a study that stated that factors causing delay inhospital treatment were the use of traditional medicine prior to presentation at the treatment center, the cost, transportation and duration of admission[4]. Since transportation cost has been associated with daily dressing of the patients' wounds measures like treatment support could be instituted in the care of these patients. This treatment supported could be trained on wound dressing to the patients at home to reduce the daily travel to the hospital or health centers for wound dressing.

Provision of enabler's package to BU patients was irregular and unreliable. The study revealed that 11.9% never received any funds as transportation to support their visit to the health facility for wound dressing. Other patients stated that they received it monthly (26.2%) whilst others had it quarterly (61.9%). There is the need to review the intervention regarding the frequency and identify alternative sources to sustain the intervention in the district. This finding is inconsistent with a study conducted by [8] on Enhancing BU Control in Ghana through social interventions.

4.4 The capacity of health staff to manage Buruli ulcer disease

The fourth objective assessed the capacity of health staff to manage Buruli ulcer. The findings revealed that health care workers had never received any refresher training, even though they were actively involved in intensified case finding and screening. This is indicative of the fact that despite the challenge, health care workers are committed to the fight against Buruli ulcer. There is the need to strengthen their skills, knowledge and competencies regularly so that they can effectively manage cases. This finding supports [18] who found out thatthe decision to either self-medicate, go to health facility or seek the services of traditional healers and spiritualists is due to the competence level of the health workers in managing the their conditions. According to [20], the traditional system accounts for up to 80% of the world's populationas the first point of call when it comes to skin problems. It has been found that traditional health practitioners are useful and will continue to be used by many in the developing countries for skin diseases because they are accessible, available and affordable as well as cultural imperative to consult them. For the health workers to take over these responsibilities from the traditional health practitioners, adequate training and skills are needed to manage the wounds effectively.In relation to diagnostic equipment for BU, it was found that they were not adequate. Majority of health care workers (70.4%) opined that the supply was erratic at the health facility. Sometimes supplies are based on demand, thus if a case was detected they had to wait for feedback from one of the reference laboratory in the country.

With regards to compliance, all health workers interviewed stated that patients were unable to complete the 8 weeks drug regimen as well as wound dressing. However, health care workers made conscious efforts to trace them during community outreach including home visit and child welfare clinic. This result confirms other studies that the deliberate introduction of social interventions tremendously improved treatment compliance [41]. This is in contrast with [30] whose study found that many of the Buruli ulcer patients depended hugely on over-the-counter drugs in addition to seeking help from traditionalists and spiritualists but not the health care facilities.

4.5 Limitations

The cross-sectional study design adopted did not establish cause and effect relationship and was susceptible to recall bias. Since a smaller samplesize was used for the study, the results cannot be accurately interpreted for a generalized population. However, there were varied views or opinions from BU patients, community members and health care workers which made the study fair and objective. Although the responses elicited pointed to the right direction, it was inadequate.

5 Conclusion

This study found lowknowledge onBuruli ulcer in the selected endemic districts and this influenced respondents' choice of place for treatment. Variables including sex and educational level of the respondents were significantly associated with the knowledge on Buruli ulcer whilst age, marital status, religion, and occupation were not significant. The health care workers did not receive refresher training on the management of BU disease. The study concludes that if health workers are trained on Buruli ulcer and more education is given to the community members on Buruli ulcer disease, the management of the disease would be improved to reduce complications associated with Buruli ulcer disease in the SekyereAfram Plains District. Also, if adequate logistics and drugs are provided, patients would comply with the treatment regimen of the condition.

6 Recommendations

i. Ministry of Health through Ghana Health Service should organize training and refresher courses for health care workers and community-based surveillance volunteers to increase their knowledge on Buruli ulcer.

ii. Health workers should intensify health education in their catchment areas to demystify Buruli ulcer disease.

iii. Government should introduce anenabler's package in the form of transportation to BU patients to ameliorateBuruli ulcer management.

iv. Government should motivate health staff who are involved in case management through regular supply of drugs and logistics and provision of incentives.

v. Further researchshould be conducted on other factors that influence the knowledge and health seeking behaviour of Buruli ulcer patients.

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