

Household Perceptions, Treatment-Seeking Behaviors and Health Outcomes for Buruli Ulcer Disease in a Peri-Urban District in Ghana

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Buruli ulcer (BU) has been associated with very unimaginable outcomes. It is flesh eating, disfiguring and economically dehydrating. Yet the disease is still mostly shrouded in mystery. Consequently, people have different perceptions about it and hence adopt different treatment behaviors towards it; notwithstanding the free treatment for it. The purpose of this paper is to identify and examine respondents' perceptions and the influence these have on their health seeking behaviors. Eighty-six BU patients who had been treated or were being treated of BU in the Ga West District Health Center in Ghana were sampled for this study. A structured questionnaire and a qualitative in-depth interview guide were used to elicit the data. Some of the interviewees held the belief that the disease is caused by their adversaries, including witches. More than half of the respondents, however, did not have any idea about the disease and thought it is just the work of God. The first point of call for health care for most of the patients studied was herbalists or else they used herbs. Nearly a quarter of them also engaged in self medication, including the use of 'pain killers' and ointments, since they took the first signs for ordinary boils. Perceptions of the cause of the disease influenced health seeking behaviors, which further influenced treatment outcomes. A lot of education is needed on the symptoms of the disease, including encouraging early seeking of care at the District Health Center.

Keywords: Buruli Ulcer; Perceptions of Disease Causation; Health Seeking Behaviors; Herbal Medicine; Ghana

Introduction

Buruli ulcer (BU) is an economically dehydrating, physically disfiguring and socially stigmatizing disease. It is perhaps the most dreaded disease that has engulfed humans after HIV/AIDS. It is dreaded because there is very limited understanding of its mode of transmission, and also because of its disfiguring outcomes. Recent findings suggest that it may occur in people who live and work close to rivers and stagnant water bodies (Vincent, Roussel, Prevot et al., 2004). Other emerging evidence also suggests that aquatic insects (*Naucoris* & *Dyplonychus*) may be involved in its transmission (Vincent et al., 2004) and that humans may become infected through contact with a swampy environment (Van der Werf, van der Graaf, Tappero et al., 1999). Though there is no available evidence of person-to-person transmission of the disease, we are cautioned that the possibility must not be ruled out (Muelder & Nourou, 1990).

The disease has in fact engulfed the African continent and is causing more misery in households than any other known disease that has trekked the continent. Wherever it enters into a household or a community, it leaves behind woes of disabilities. The threat from the disease lies not in the absolute number of people infected, as globally, it is the third common mycobacterium disease in humans after tuberculosis and leprosy (WHO, 2006). However, the consequences for those afflicted are terrible. By the time the disease is detected by health or trained community workers, over half of the patients are already crippled. Due to its destructive nature, the WHO declared it a dis-

ease of public health concern in 1998. The major burden of the disease is said to be in West Africa where an increasing number of cases have been recorded in nearly all the countries, especially along the Gulf of Guinea. In fact, it is currently endemic in Benin, Cote d'Ivoire, Ghana, Guinea, Liberia, Nigeria, Sierra Leone and Togo (WHO, 2006).

In Ghana it was first reported in 1971. Since then spots of cases have been recorded in almost all parts of the country (Amofah et al., 2002). The disease is known to be endemic around the middle belt of the country: Ashanti Akim North and Amansie West Districts for instance, and the coastal zone—the Ga West District. The national prevalence rate of active BU lesions is estimated at 20.7 per 100,000 generally, and 150.8 per 100,000 in the most disease-endemic districts. The BU prevalence rate exceeds that of leprosy (9 per 100,000) nationally, making BU the second most prevalent mycobacterium disease in Ghana after tuberculosis (prevalence of 66 per 100,000) (Amofah et al., 2002).

In a couple of studies in Ghana and elsewhere, it has been established that the disease is very expensive to treat especially when suspected cases are not reported early (Asiedu & Etuafu, 1998; Drummond & Butler, 2004; Mumma, Whitney, Dadzie et al., 2003). Until recently, the only form of treatment was surgery, sometimes with or without skin grafting. This involves huge costs to individuals and households. This largely deters affected persons from reporting early for treatment until they have tried other means. In 2005 following a request by the

WHO that the treatment of BU be made free in member countries, the government of Ghana through the support of donor partners and development NGOs removed the medical fee for treating BU patients. The rationale for this declaration was two-fold: first, to motivate persons to report early for medical attention and second, to reduce the cost burden of treatment and to protect affected persons from impoverishment. However, this attempt has not received the desired response.

Affected persons still continue to present BU infection in deteriorating conditions for care. In a related study, it was found that about 77 per cent sought treatment from other sources (especially from herbalists) before eventually reporting at the District Health Center. Oppong and Williamson (1996), however, indicated that this pattern of seeking health care is nearly the norm in Ghana. This paper examines the characteristics of BU infected households, their health seeking behaviors within the context of their perceptions of the disease, and the outcomes of care seeking for the disease.

Design and Methods

Study Area

The study was conducted in the Ga West District of Ghana. The district was selected mostly because of its importance in BU distribution in Ghana. BU is endemic in the district. It has the highest number of reported BU cases in the Greater Accra Region and it is the fifth most BU endemic district in the country. A study by Amofah et al., (2002) indicated that the prevalence rate of the disease in the Ga West District was 87.7 per 100,000. There is a BU treatment Center in the district that provides free medical care for patients. But most of the endemic communities are found in the rural areas of the district. These areas include Konkon, Alafia, Awudiana, Obom and Bibianiha. However, there is poor distribution of health facilities in these rural areas of the district relative to the more urban communities. This raises the problem of access to health care for the majority of the population who are affected by BU, which has implications for health seeking behavior and health delivery among the rural communities.

The district is a peri-urban district with more than 70 per cent of the population living in areas that can be described as urban. Yet in terms of infrastructure, the district is less developed and portrays rural characteristics. Politically, the district is designated officially as a peri-urban district, with more than 70 per cent of the population living in urban areas. Yet in terms of infrastructure, the district is less developed and portrays rural characteristics. With the exception of the District capital that has the characteristics of an urban area, the rest of the district is rural. Again, apart from the trunk road that leads to the district from Accra, the national capital, roads leading to other communities within and outside the district are untarred and largely unmotorable during raining seasons. Poverty is high in the district, and rural poverty is severe and deep (54%). Furthermore, besides the urban population who have access to safe water from bore-holes or are served by water tankers, the rest of the population, especially rural communities, get water from streams, wells and ponds. The large concentration of the population is in the district capital, Amasaman, which is a big receptacle of the population spill over from Accra.

The 2000 Ghana Population and Housing Census, the latest with confirmed data, indicated that the district had a population

density of 491 persons per sq km, which is higher than the national population density (79 per sq km). This gives an indication of great pressure of population on land resources. The major economic activity of the district is farming. About 70 per cent of the people are engaged in agriculture. There are eight health facilities in the district: two in Amasaman, four in Weija, one in Obom, and one in Mayira. Other health centers located in Oduman and Ngleshie Amanfro serve a considerable proportion of the rural population of the district. These are mainly provided by the government, though there are a number of private clinics and family planning and maternity homes. Health care to the rural communities is augmented by outreach services provided on monthly basis by the Ministry of Health (MOH) and some non-governmental organizations (NGOs).

Data Collection Methods

Cross-sectional data were collected in June 2008 from a purposive sample of 86 BU patients, but household heads were interviewed if the patients were minors (15 years or younger). We relied on records from the District Health Center and the BU Center in the district for information on affected communities and households, which aided us in locating the interviewees. For purposes of problems with recall, only patients who had received or were still receiving care for BU from the orthodox health centers within one year from the period of data collection were interviewed. A semi-structured questionnaire which made room for qualitative answers as well as the main instrument used in collecting the information for this study. The study was explained to the respondents and their consent was sought before the data were collected. Knowledge about the disease was assessed in order to see how far community knowledge corresponds to biomedical concepts. Typical questions included knowledge about causes and symptoms of BU, treatment seeking behaviors, reasons for these, and treatment outcomes. Peoples' reported knowledge that deviates sometimes from biomedical concepts is termed "beliefs" (Hausmann-Muela, Ribera, & Nyamongo, 2003). Questions on socioeconomic characteristics of the respondents were also asked. These were complemented with an in-depth interview with the Supervising Nurse of the BU Treatment Center, and physical observation of the infected persons. Analysis of the qualitative data was based on themes, associations and patterns that were identified.

Based on the methodology, our findings have some limitations. These include the use of convenient samples which is dependent on hospital data. This limits the generalizability of our findings to the rest of the population. Additionally, problems with recall may serve as a limitation.

Institutional Review Processes

The study which started as a student dissertation went through three review stages for approval. First, the Graduate Committee at ISSER reviewed it. Second, it was reviewed by the Social Faculty Board of the University of Ghana, and third by the Graduate Studies Board of the same University.

Results

Characteristics of BU Patients and Households

Given the nature of the study district, more than 90 per cent

of the BU victims lived in remote communities from the district capital. Most of the endemic communities such as Obom, Okonkon, Kotoku and Bibianiha are more than 50 kilometers away from the District Health Center (DHC). With the exception of Obom where there is a health post, the rest of the endemic communities only benefit from monthly outreach health services. About 54 per cent of households interviewed were aware of the free treatment for BU before coming to the DHC, whilst the rest got to know that only after they came to the DHC for medical attention and were sent to the BU treatment unit. More than 67 per cent of those who had heard of the free treatment prior to seeking care at the DHC indicated that they were informed by World Vision—Ghana, an international NGO operating in the district. The rest said they were told by either a relative or a friend.

The BU victims were largely less educated. Only about two per cent (2.3%) reached tertiary level, whilst about 34 per cent received or were receiving primary education (**Table 1**). Nearly a third of the victims who had passed the school-going age had no formal education. The study did not find so much variation in the age distribution of the people affected. Counter-evidentially, we found that there was no significant variation between the percentage of children (15 years and below) affected and adults (16 years and above). Whilst about 49 per cent (48.8%) of those affected were below 15, approximately 51 per cent of the other infected persons were 16 years and above. We did not find anybody more than 65 years treated or being treated for BU in the district. We also found no variation in the sex distribution of the affected patients: females (49%) were nearly equally affected as males (51%). In terms of occupation, 22 per cent of the BU victims engaged in farming. The majority of the victims were, however, school pupils or students (57%). Only a

few were engaged in other economic activities such as trading, driving, carpentry or masonry. About seven per cent of the other infected persons who were adults were unemployed.

As noted earlier the predominant economic activity in the district is agriculture. In consonance with this more than 60 per cent of the households of the BU victims were agriculture-dependent. They were mainly engaged in subsistence farming for household consumption. Only a few were artisans (15%) and just two per cent were civil servants. The median household size was five. The average annual income of the households was GH¢ (Ghana cedis) 490.70 (by the time of the study, GH¢1 was equal to approximately one (1) United States dollar), with an annual per capita income of GH¢98.

More than a quarter (23 people) of the BU victims interviewed were heads of households. From this proportion we found that more than 50% of them were engaged in farming with only a few engaged in other activities such as fishing, trading and carpentry. About nine per cent were civil servants and about four per cent (4.3%) were unemployed (**Table 2**).

Respondents' Perceptions about BU

Notwithstanding the damaging impact of the disease, knowledge of it was still lacking. Respondents who seemed to know about it had very scanty information on it. Even this scanty information on the disease was doubted by many residents in the districts we interacted with, particularly in the rural areas. The interviewees ascribed various reasons for the occurrence of the disease in their households. Although a lot of people did not know the cause of the disease and did not suggest any reason or accuse anybody for their predicament (53.5%), 15.1 per cent of respondents attributed the cause of the disease in their households to their “enemies”. About 19 per cent of respondents thought that they got the disease from the water they use. This response was common with households living and working along the valleys of the Densu, Onyasias, and Ntrafra rivers. They thought that children generally got the disease by swimming in the river and the adults may have gotten the disease through wading across the river and coming into contacts with swampy valleys and muddy areas. Others attributed getting the disease to insect bites (12.8%).

Those who held the belief that the disease was caused by their enemies suggested that there are witches who have “disease-giving power” and can inflict it on someone who annoys them or on anyone they decide to harm. These persons did not believe that a small blister on their elbow or wrist could just

Table 1.
Socio-demographic characteristics of BU patients studied.

Variable	Attribute	Percentage
Sex	Male	51.2
	Female	48.8
Age distribution	1 - 10	30.2
	11 - 15	18.6
	16 - 35	31.4
	36 - 65	19.8
Education level reached ¹	None	31.4
	Primary	33.7
	JSS/MSLC ²	18.6
	Sec/tech	11.6
Occupational status	Tertiary	2.3
	Farmer	22.1
	Trader	5.9
	Gov. employee	2.3
	Driver	3.5
	Carpenter/Mason	2.3
Treatment outcome	Pupil/student	57.0
	Unemployed	7.0
	Scar	57.0
	Inactive joints	43.0

Source: Authors' survey, 2008.

¹Two of the BU patients (2.4%) were children below school going age and thus excluded from the analysis on education.

²Junior Secondary School/Middle School Leaving Certificate.

Table 2.
Occupation of BU affected persons who were household heads.

Occupation	Percent
Farmer	52.2
Driver	17.4
Carpenter	8.7
Trader	4.3
Fisherman/fishmonger	4.3
Civil servant	8.7
Unemployed	4.3

Source: Authors' survey, 2008.

turn into a big sore resulting in the disabling of their hands. Some of these persons also accused others of envying their progress in life.

“There are some people, when they see that you are progressing in life they envy you. Some people even have the power of causing your pineapple farm to spoil. This one (BU) is even better. They can cause you to get leprosy so that you are not able to work again”.

Pineapple is a major crop cultivated by most people in the district.

A driver who attributed his infection to an enemy intimidated that:

“I know the person who did this to me. He is a fellow driver. He was sacked by his master and the car he was driving was given to me. So he accused me of influencing his dismissal and he told people that he will ‘show me’. As for me I know I did not influence his dismissal. So I only leave him to my God”.

When asked why he thinks it was the dismissed driver who caused his infection, he said:

“Apart from the fact that my other colleagues informed me of it, this sickness started with a small boil which burst out and I put tetracycline on it. Then within a week it re-emerged and started swelling which is unheard of. I have been having boils of this nature but it has never gone beyond a week. I think now he is happy that I am at home” (unemployed).

People who held similar beliefs did not think that a common insect bite could degenerate into a big sore like their own, nor did they think that there is a bacterium that is so difficult to treat like the one that causes BU. Two people who were undergoing treatment at the DHC had no confidence that the medicine they were taking would help; nor did they think surgery would give them the needed relieve.

“If I don’t come for treatment they will say it is because I am an illiterate that is why I don’t believe the doctor or the potency of his medicine. But I know that this disease will not go away”.

Although some people mentioned insect bite as the cause of BU, they were not able to tell the particular insect. They thought that they must have gotten the disease from the insect bite which later got infected through contact with dirt as a result of working on the farm or walking through dirty water. They believed that the persistent scratching must have opened blisters through which some other germs penetrated to cause this infection. They contended that that is why it affects only their lower limbs and especially the knee.

“You know we farmers are always in the swampy valleys on our farms. Our constant walking through or standing in the dirty water expose us to so many insects, worms and bacteria. So I am sure that I got it from there”.

Similarly, it was suggested that children also get the disease from swimming in dirty stagnant water. Seven household heads indicated that their children got the disease from swimming in rivers in their communities. One woman spoke about her child:

“He swam in the river one evening and when he woke up the following morning he had scratched his arm to form blisters. But we didn’t take it serious. Later the blister closed up and swelled up. Before we could realize that it was serious the place was swollen and soft”.

The beliefs the respondents held about the cause of the disease mostly influenced what they did when they first noticed the change in body structure or color. Those who accused their enemies of being the cause did not think nor had any hope that the orthodox health facility could provide any effective medical help to them.

“As for the attack of witches, unless you get a strong herbal medicine or you go to a very powerful fetish priest who can drive out the infliction of the witch’s charm or destruction on you....”

Even after having been treated from the DHC some patients did not still fully trust that the disease was not caused by witchcraft.

“When I first got the boil I was using hot water and some drugs from a chemical store. When it was not improving I went to a herbalist in the next village. In fact, he helped me a lot. I am sure it was after he had chased out the spiritual power of the witch that the doctor was able to undertake the surgery. The herbalist did very well”.

Affected Households’ Health Seeking Behaviors

The respondents were asked about their first action towards treatment when they noticed the change in their body structure/skin color. Among most households, herbs were used predominantly. We found that 37 per cent used a local herb known for treating a boil, 24 per cent engaged in self-medication, applying hot water and some left-over medicines at home (mainly paracetamol and medicated balms). Only 18 per cent of the respondents reported to the DHC immediately. About four per cent others sought prayers from their local pastor, but eight per cent (8.1%) did nothing until they later realized that the disease was not subsiding (**Table 3**).

Reporting late to the DHC for timely health care was the main problem that seemed to have prevented the respondents from averting the disabling effect of the disease. An interview with the Supervising Nurse of the BU treatment unit at the DHC revealed that persons affected by the disease report to the Center only after other efforts, largely herbal, have failed and the situation seems not to be subsiding.

Table 3.
First reaction to the change in body structure/color.

Reaction	Frequency	Percent
Used herbal treatment	32	37.2
Visited chemists	8	9.3
Self-medicated	21	24.4
Visited DHC	16	18.6
Sought prayers	3	3.4
Did nothing	7	8.0
Total	86	100.0

Source: Authors’ survey, 2008.

In all over 74 (74.4) per cent of households interviewed sought treatment elsewhere before reporting at the DHC. Of this number, half (50%) visited herbalists, whilst nearly one-third (32.8%) resorted to self-medication (**Table 3**). People in the rural areas usually resorted to the use of herbs before taking other measures.

To a large extent the respondents' perception of the disease influenced their health seeking attitude. As **Table 4** shows, all those who thought their infection was caused by their enemies or witches consulted herbalists before reporting at the DHC. These people did not seem to believe in orthodox medicine, or the ability of the medical doctor to "understand the cause of their infection". According to the Supervising Nurse of the BU Treatment Center, some patients even abscond whilst receiving the antibiotic treatment. She lamented as follows:

"There are some people who do not believe that the orthodox medicine can heal their wounds. When some of them are referred to us from the General Services unit and they are told to stay and undergo the antibiotics administration, they abscond after just some few days. Some come back later with virtually 'rotten' wounds with herbal medicine all over the open sores".

From **Table 4**, those who reported immediately to the Health Center upon noticing the infection were mostly those who thought it was an insect bite (54.5%), although in absolute terms more of those who did not guess the cause of the disease consulted the DHC than the rest. In fact, those who did not presume any cause spread quite evenly through all the various treatment options except visiting a private clinic. The latter were lowly represented. About the same proportion of those who had no idea about the cause of BU consulted the BU Center directly or bought drugs from a drug store (30.4%) or visited a herbalist (28.3%). Similarly 27.3 per cent of those who thought they got infected through insect bites visited a drugstore, whilst 18 per cent utilized the village herbalist.

Patients or household heads/guardians were asked why they took that first treatment action they did. To those who blamed insect bites and/or the water they used as the cause of the disease, and those who did not have any idea about the cause of the disease, distance to site of treatment, perceived treatment cost and lack of knowledge about what was the best action to take were the main motivating factors that led them to visit or use herbal treatment. Hence for 39.5 per cent of the households studied, the main reason for seeking relieve from BU from herbalists was accessibility. For those who utilized herbs or visited a herbalist, seven (43.8%) of those who attributed the infection to the water they used, three (27.3%) of those who said insect bites were the cause, and thirteen (28.3%) of those who had no idea of what caused the disease said they did so because the herbalist was more accessible, less costly and wasted less time or gave quick attention. Others simply used the herbalist as a "try-and-see method" because they did not know of the cause of the disease.

"One time I had a boil and the herbs was what I used and it got healed. So though I don't know the cause of this disease I just tried it (herbs) to see if it would heal".

Sixteen (34.8%) of those who said they did not know the cause of the disease, three (27.3%) of those who said insect bites were the cause, and five (31.3%) of those who attributed it to the water they use said they reported to the DHC because

they trusted the orthodox medicine and care. Almost all (92.3%) of those who accused their enemies or witches for their predicament with BU said they did not trust that the DHC could be of help to them. One of these, however, said the National Health Insurance card he possessed enabled him to come to the Health Center only to be referred to the BU Center. Almost all of those who sought care from pharmacies said they did so because they thought they were afflicted from a simple boil.

Health Seeking Behaviors and Treatment Outcomes

The body parts mainly affected by the disease (BU) were the limbs covering major joints. Due to this, most people come out of treatment with limited functional joints (inactive joints). This study found that about 43 per cent of cases ended with inactive joints (**Table 5**). This was more prevalent among people who utilized the herbal treatment before coming to the DHC. Approximately 60 per cent of all those who visited herbalists before reporting at the BU Center ended with inactive joints. This was more than four times higher than those who reported immediately at the BU Center and over two and a half times more than those who started with visits to the drugstore. Only 13.5 per cent of those who reported immediately to the BU Center ended up with inactive joints. Most of the patients with this poor outcome were children below age ten.

As depicted in **Table 5**, the common outcome for persons who reported early for orthodox treatment was a scar. The first place of consultation for about 41 per cent of those whose treatment ended with scars was the BU treatment center. This is because once the disease is detected early it becomes easy to treat it with antibiotics. The first treatment action at the BU Center is provision of the prescribed rifampicin and streptomycin

Table 4.
Perceived cause of BU and first place of health care.

Place	Water	Insect	Enemies/witch	No idea	Total
Herbalist	37.5	18.2	100.0	28.3	39.5
Drugstore	25.0	27.3	0.0	30.4	24.4
BU center	31.3	54.5	0.0	30.4	29.1
Private clinic	6.3	0.0	0.0	10.9	7.0
Total	18.6	12.8	15.1	53.5	100.0

Source: Author's survey, 2008.

Table 5.
Place of first consultation and treatment outcome.

Place	Scar	Inactive joint
Herbalist	24.5	59.5
Drug store	26.5	21.6
BU Center	40.8	13.5
Private clinic	8.2	5.4

Source: Author's survey, 2008.

for a mandatory eight weeks. Whilst doing this the patients are put under intensive care to ensure that they take the dosage at the right time, based on WHO's (2004) recommended directly observed treatment system (DOTS).

Respondents who visited other places before finally reporting to the BU Treatment Center were also asked about how and why they eventually came to the BU Center. Almost all of them (92%) came because they did not see any improvement in their condition. About five per cent said they were advised by their relatives to seek care at the Center, and three per cent came to the Center because they could no longer afford the cost of treatment they had to bear at private clinics.

Discussion

Our findings are very crucial for policy rethinking and reorientation. We found that whilst more children were affected by the disease, the difference is rather insignificant to merit the continuous assertion that children suffer BU more than adults. This finding also confirms the fear expressed by Amofah and others (2002) that the impression should not be created that the disease affects only children. If this caution is not taken seriously we may end up concentrating resources and communication on children whilst adults suffer silently. The continuous reportage of a preponderance of the disease among children may be borne out of the fact that adults are likely to send a child for health care more readily than they will do for themselves. Contrarily, since some of the respondents associated BU with supernatural forces such as witchcraft and curses, adults may tend to hide their infection for fear of being ridiculed or labeled. Meanwhile the immediate economic impact of the disease is even greater with adult victims than with children. Note this lamentation from an adult BU victim:

"I bore my sore for more than eight months. When I first noticed it I was using hot water and *Akobalm* (a local herbal balm). Then later I went to our local herbalist for some herbs and it subsided, but reemerged. When my friends started shunning my company because the sore smelled badly, I decided to stay indoors. Then I heard that World Vision was treating people with sores. When they came to my village somebody brought them to my house and I was taken to the hospital".

We found this to be the common situation with adult victims. It is difficult to understand why the perception of the disease does not seem to change notwithstanding several outreach programs by NGOs and the National BU Control Program (NBUCP). People still conceive of the disease in both biomedical and magico-religious realms (Stienstra, van Der Graaf, Asamoah et al., 2002).

Depending on the knowledge or perception of the cause of a disease, the attitude to the search for a cure was different. Clearly, peoples' perception of the causation of BU affected their health seeking behaviors, which in turn affected treatment outcomes, to some extent. Two reasons may explain why about two-fifths of the patients whose first point of health care was the BU Center ended up with a scar which is comparatively a better outcome. First it can be said that the orthodox health care for the disease is effective. Recent research and clinical experience have shown that a combination of the rifampicin and streptomycin or amikacin¹ given for 4 - 12 weeks has the potency of killing the mycobacterium ulcerans in early lesions of

the disease (WHO, 2004). Second, there is a high likelihood that those who consulted the BU Center presented pre-ulcerating cases (nodule). Our findings are in line with those of Awusabo-Asare and Anarfi (1997) who noted that those who associate a disease with supernatural causes (for example witchcraft, curse, enemies, and so forth) adopt health seeking attitudes different from those who accept the germ theory of disease causation.

It is equally crucial to note that the health seeking behaviors of households have direct or indirect impact on the treatment outcomes and the economic burden of the disease. It is noteworthy that about three quarters (74.4%) per cent of the respondents indicated that they sought care at other places before reporting at the District Health Center. Most of these patients ended up with limited functional limbs. We did not find that any of the BU patients we studied was fully treated at any of the places where they sought health care other than the District Health Center. Consequently, all the patients we studied eventually reported to the District Health Center for care. This late reporting invariably means that the disease was presented in a deteriorating stage requiring long periods of hospitalization and complex forms of treatment. This increases the cost of medication (more antibiotics, long periods of wound dressing, and so forth) and high opportunity cost. Many also ended up with dysfunctional joints or limbs.

In a community where more than 50 per cent of infected people and their caregivers have no idea what the cause of the disease is and more than 15 per cent attributed it to their enemies, the unorthodox treatment actions adopted is expected. Nevertheless, the health seeking patterns we found is worrying since it leads to delays in reporting and consequent disabling outcomes of treatment with severe implications for development. Nearly 40 per cent of households who said they might have gotten the disease through contacts with water consulted herbalists. It is not surprising that this proportion (about 40 per cent) of the respondents cited easier accessibility to herbalists as the most important reason for consulting the latter. As stated earlier, most of the endemic communities are found in the rural areas of the district where portable water is difficult to come by and distribution of health facilities relative to BU endemicity is poor. As noted earlier, with the exception of Obom where there is a Health Center, the rest of the endemic villages have no health posts. These are also communities which are less frequently plied by vehicles.

On the other hand the herbalists live with them in the communities especially in the rural areas and are therefore very accessible, and also, less costly. The proportion that consulted herbalists was six times more than those who held the same perception of getting the disease through contact with water, and consulted a private clinic. Clearly the use of private clinics is not popular in the district. In fact, private clinics were consulted the least. This may be attributable to the low number of private health facilities in the district or perhaps the huge cost involved in utilizing private health care services may be a dissuading factor. Herbalists were the most popular outlets for consultation in the district.

However, regardless of perceptions, health seeking behavior falls within the general pattern of health seeking in a community, which is arguably socio-cultural and socio-structural. No matter the perception that people held about the disease, herbalists seemed to be the first place that people consulted before seeking orthodox care later. These may be due to the prevalent

medico-religious beliefs about the disease. Moreover, before contacts with colonialists and the subsequent introduction of allopathic medicine, herbal medicines and other forms of medico-religious treatments were the norm for Ghanaians, which has not changed much given several factors such as remoteness and the far higher cost for allopathic health care (Oppong & Williamson, 1996).

Generally, the patients in this study decided to come to the hospital only when the wound continued to increase in size, worsen in ulceration and after a realization of failure of prior treatment. In line with their perception of the cause of the disease, those who went to herbalists thought the public health facility could not treat such cases; others believed that medical doctors are unable to understand magico-religious causes of diseases. The study found that treatment for most of the cases, especially among children less than fifteen years, resulted in inactive joints (65%). This treatment outcome will have serious socioeconomic implications for the future of these children and their households.

The immediate and long-term impact of the disease on children is two-fold. First, the prolonged morbidity and hospitalization could lead to serious disruption of their schooling. The education of these children in most cases was curtailed due to long periods of absence from school and more often than not they were unable to rejoin their school colleagues because of personal and family stigma that surrounds the disease. Second, outcomes involving amputations and disabilities among children may affect their future productivity. Productivity of these children in adulthood would be hampered and their households would ultimately be affected. Children disabled by the disease may grow into adulthood and may become a burden on society as in Ghana persons with disabilities are mostly left without the necessary rehabilitation and socio-structural support apart from the typical minimal extended family support.

The immediate impact of the disease on household poverty reduction and a community's development is enormous. This can be located in the loss of income due to inability to work and the limited functionality of vital body parts as a result of contractures. Complications such as contracture deformities are frequent and adults disabled by this will not be able to work on farms. It is even serious when one considers that 24 per cent of the victims with those outcomes were mainly people in the most productive stage of their lives (16 - 35 years old), and very worrying to the futurist as closed to 65 per cent (64.86%) were children below 15 years.

The BU treatment fee exemption policy is supposed to reduce the total cost of treating the disease and increase the chances of people reporting early with the slightest symptom they notice. It is also expected to protect households from making catastrophic payments for treatment which may consequently push them further adrift the poverty net. But the fact that a lot more people still resort to herbal medicine for treatment first before coming to the DHC brings to focus three possible explanations. First, the fee-free treatment policy may not have been communicated to the rural communities so well to reduce their fear of the huge cost of treatment associated with the disease. Second, the long period of mandatory hospitalization (for the directly observed administering of the antibiotics) and the associated lost of working days, and for that matter loss of household income discourage many from visiting the Health Center. Third, there may be problems with access to the orthodox health care services as access to health care is a typical

problem in Ghana, particularly in rural areas with poor roads (Oppong, 1992; Oppong & Williamson, 1996; Hausmann-Muela, Ribera, & Nyamongo, 2003), as prevails in most part of the study district. The results of this study actually shows that most of the cases were presented late and therefore required prolonged periods of stay in the hospital. An important component of any health intervention program must deal with providing information to people, educating users and channeling the information in a manner which is acceptable to all (Hausmann-Muela, Ribera, & Nyamongo, 2003).

Information, education and communication campaigns that combine strategies, approaches and methods that enable individuals, families and communities to play active roles in achieving, protecting and sustaining their own health is needed. The influence of underlying social, cultural, economic and environmental conditions on health must be undertaken with the aim of bringing about behavior change. The education of particularly endemic communities to encourage them to seek early medical treatment is important. More important in the fight to eradicate BU in our environs is the need for early detection of cases. Although this was a focal topic in the resolution signed in the Yamoussoukro Declaration (WHO, 1998), not much attention has been given to it. Today, the overwhelming majority of patients present too late. It is important that we closely examine our current efforts and constraints, as well as the resources required to carry out these activities, and how they could be implemented in various situations. This will help in our collective efforts to reduce poverty in society.

The free treatment alone may not be the panacea as evidence abound elsewhere that even in the presence of free public health services at the point of delivery, the total cost of BU still imposes a considerable burden on households. This implies that we will need to do more to be able to detect cases early or prevent infection if possible, to reduce treatment cost and reduce the burden on the economy. Early detection requires surveillance. BU surveillance in Ghana is inadequate, suggesting that the number and geographical extent of reported cases represents only the tip of the iceberg (Amofah et al., 2002). Collaboration with other relevant disease-control programs to enhance BU surveillance needs to be explored and discussed.

Very little is known about the BU disease in terms of its carrying vector, mode of transmission, cure beyond surgery, and administering of rifampicin and streptomycin. What is not in doubt is that it is a "flesh-eating" disease. Because of its apparent mysterious nature people hold different beliefs about it which ultimately affect their health-seeking behaviors. This study set out to assess households' perception, consequent health seeking behaviors, and outcomes of BU in the Ga West District of Ghana, a district with the worst BU infection in the Greater Accra Region where it is situated and fifth prevalence nationally. Orthodox treatment for BU is free and attempts are made to provide relevant information to help with better targeting of health seeking options among endemic communities. In the midst of the understandably socio-cultural perceptions about disease causation, difficult geographical settings which limit options for early health seeking at the orthodox health care centers, and the general health seeking patterns among Ghanaians, particularly rural dwellers, the treatment actions that the individuals we studied adopted largely emanated from their perceptions about the disease. Peoples' symptomatology of the disease is still immersed in cultural beliefs. About 75 per cent of the respondents sought various forms of health care before

reporting to the District BU Center. Our study found an important relationship between the respondents' perceptions of causation of the disease, health seeking behaviors, and treatment outcomes. Respondents who sought care from the BU Center sooner were less likely to end up with permanent disabilities.

Mapping of affected villages and surrounding ecological factors (for example, rivers and farms) will help in understanding the geographical distribution of the disease and its relationship with ecological factors that may promote the occurrence of the disease. For instance communities along the Densu River and its environs need to be mapped out and closely studied. Such information will be useful in targeting communication, control and research efforts on BU. There is also a very great need to train a large number of village health workers, school teachers and other community opinion leaders in order to improve the detection and management of cases. These categories of people will also help in educating community members on the symptoms of the disease and the fact that it can be treated with early presentation. Since they constitute an important primary cadet of caregivers for the BU patients we studied, herbalists in the rural communities must also be roped into any BU education program to help them identify early symptoms of the disease, and possibly refer patients early on contact.

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