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Neglected Tropical Disease in Nigeria: Implication for Health Education

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Abstract
This work looked at neglected tropical diseases in Nigeria; implication for health Education. The paper saw neglected tropical diseases as a medically diverse group of tropical infections which are especially common in low-income populations in developing regions of Africa, Asia, and the Americas. They are caused by a variety of pathogens such as viruses, bacteria, protozoa and helminthes, unsafe water, poor housing conditions and poor sanitation. It is neglected because government at the three tier level is not interested in such diseases and many people do not see it as priority to control it through prevention or by therapeutic method, health educators have not created enough information or awareness about those diseases for the population to become conscious of it and health agencies like WHO, UNICEF, USAID, Center for disease control (CDC), the Cater Center (TCC) have little report about such diseases in Nigeria. There are 17 different types of these neglected tropical diseases identified by WHO. Seven of these diseases are mostly affecting Nigerian but six were addressed with their implications for health education in this paper. They are lymphatic filariasis, onchocerciasis, schistosomiasis, and three soil-transmitted helminth infections (hookworm, ascariasis and trichuriasis). The implication of this study is that health educators should arise and create awareness in these diseases in order to improve health status of people at the endemic areas through organizing seminar/workshop to educate communities on the preventive measures and early detection of the neglected tropical diseases.
Key words: Neglected Tropical Disease, Nigeria, Health Education

Introduction

In Nigeria today many tropical diseases are attacking a good number of human populations in the communities causing serious havoc in the form of morbidity (sickness) and mortality (death) and have been neglected by both the people in endemic area and the Nigerian government. Neglected tropical diseases are a medically diverse group of infections which are especially common in low-income populations in developing regions of Africa, Asia, and the Americas. They are caused by a variety of pathogens such as viruses, bacteria, protozoa and helminthes (World Health Organization, 2012). Other causes include unsafe water, poor housing conditions and poor sanitation (WHO, 2013). Children are the most vulnerable to these diseases, which kill, impair or permanently disable millions of people every year, often resulting in life-long physical pain and social stigmatization. The burden of these diseases is further amplified by the fact that many require chronic and costly care, underscoring the economic as well as the health benefits of preventive chemotherapy and early detection and care (WHO, 2015). Neglected tropical diseases affect more than 1 billion people, primarily poor populations living in tropical and subtropical climates (Hotez, 2011).

They are frequently clustered together geographically and individuals are often afflicted with more than one parasite or infection (WHO, 2010). More than 70% of countries and territories that report the presence of neglected tropical diseases are low-income or lower middle-income economies (WHO, 2015).

Many reasons account for the neglect by the victims, the government and even non-governmental agencies. These reasons include the fact that:

- Those diseases are not rampart in the society, implying that the people suffering from it are few at a given time.
- Its pathology or effect on man is virulent as such too harmful, disturbing and insidious (spreading gradually or without being noticed and causing serious harm).
- Another reason why it is neglected is because government at the three tier level is not interested in such diseases and many people do not see it as priority to control it through prevention or by therapeutic method
- Most importantly, is that health educators have not created enough information or awareness about those diseases for the population to become conscious of it.
- Also the health agencies like WHO, UNICEF, USAID, Center for disease control (CDC) The Cater Center (TCC) have little report about such diseases in Nigeria. These diseases are lacking a strong political voice; people affected by these tropical diseases have a low profile status in public health priorities. Lack of reliable

statistics and unpronounceable names of diseases have all hampered efforts to bring them out of the shadows (Kazuyo, 2014)

There are a lot of neglected tropical diseases in Nigeria, those diseases that persist under conditions of poverty and are concentrated almost exclusively in impoverished populations in the developing world like Nigeria (Hotez, 2012).

There are 17 different types of neglected tropical diseases identified by WHO (2013). They include dengue, rabies, blinding trachoma, Buruli ulcer, endemic treponematoses (yaws), leprosy (Hansen disease), Chagas disease, human African trypanosomiasis (sleeping sickness), leishmaniasis, cysticercoids', dracunculiasis (guinea-worm disease), echinococcosis, food borne trematode infections, lymphatic filariasis, onchocerciasis (river blindness), schistosomiasis (bilharzias), soil-transmitted helminthiases (intestinal worms;- Hook worm, Ascariasis, Trichuriasis). Most of these neglected tropical diseases can be prevented, eliminated or even eradicated with improved access to existing safe and cost-effective tools. Control relies on simple interventions that can be carried out by non-specialists for example school teachers, village heads and local volunteers in community-based preventive action (WHO, 2013).

Seven of them which include: lymphatic filariasis, onchocerciasis, trachoma, schistosomiasis, and three soil-transmitted helminth infections (hookworm, ascariasis and trichuriasis) are the most prevalent and are responsible for the majority of the NTD disease burden, affecting 1.4 billion people worldwide (WHO, 2013. Six out of these seven that are most neglected in Nigeria are addressed one by one with their implications for health education.They are lymphatic filariasis, onchocerciasis, schistosomiasis, and three soil-transmitted helminth infections (hookworm, ascariasis and trichuriasis).

Lymphatic Filariasis

Lymphatic filariasis is an infectious, parasitic disease caused by nematodes (roundworms). The disease is caused by the presence of thread-like worms, called filariae, in the lymphatic vessels and lymph nodes of the body (Braide, Ikpeme, Edet, Atting & Kale, 2003). The lymphatic channels drain excess fluid from the body and play a role in the infection-fighting immune system, Lymphatic filariasis is transmitted by mosquitoes (WHO, 2011). A blood meal taken from an infected individual is then injected into an uninfected person. Unlike lifelong residents, travelers to affected regions usually do not accrue sufficient exposure to the parasite to generate the severe complications. Lymphatic filariasis most commonly occurs in developing countries with a tropical climate. Wuchereria bancrofti, Brugia malayi, and Brugia timori are the specific worms that cause the infection (WHO, 2012). The larvae enter the body at the time of the mosquito bite and travel to the lymphatic system, where they mature into adult worms (Amaechi, Nwoke, Ukaga,Uduji, Prince, Onyeka & Okere, 2011). The adult worms can live for years in the lymphatic system, and they produce immature forms that circulate in the blood (Kazuyo, 2014).

Lymphatic filariasis causes blockage of the lymphatic channels, leading to swelling and eventual scarring of the legs, known as elephantiasis, and in men, to swelling of the scrotum, or hydrocele (Braide etal., 2003). These symptoms are extremely disabling, These conditions are also disfiguring, and, in some communities around Nigeria, people with the disease may be shunned (Hotez, 2011). The disease is endemic in 73 countries with an estimated 120 million people infected and 40 million people with clinical manifestations including lymphoedema (elephantiasis) of the limbs and genital disorders, especially hydrocele in men (WHO, 2011). In Africa, 34 countries are endemic, and Nigeria is believed to bear the highest burden of LF, with an estimated 80 to 120 million people at risk (Hotez, Asojo &Adesina, 2012).

The principal elimination strategy is to interrupt transmission using Mass Drug Administration (MDA) with the combinations of albendazole plus ivermectin or albendazole plus diethylcarbamazine (DEC) administered once a year for at least five consecutive years (WHO, 2012).The use of integrated vector management (IVM) is advocated in malaria co-endemic areas where both diseases are transmitted by *Anopheles* mosquitoes (Federal Ministry of Health 2008). Finally, a provisional strategy for interrupting LF transmission in loiasis endemic countries recently developed recommends albendazole (400 mg) twice yearly in combination with vector control in all co-endemic areas. The coordinated effort of global disease control programmes is becoming increasingly important as many operate in the same countries and distribute interventions that have multiple benefits. These interventions have also been shown to impact LF transmission in a range of ecological settings, thus more synergy between the programmes in Africa could optimize resources and increase the impact on both diseases (Federal Ministry of Health, 2012).

In countries such as Nigeria where malaria and LF are co-endemic and both transmitted by *Anopheles* mosquitoes (Federal Ministry of Health 2008). The use of Insecticide Treated Nets (ITNs) has shown to be effective at reducing LF transmission in *L. loa* co-endemic areas (Emukah, Graves**,** Mosher ; Rakers, L & Miri, (2009). ITNs have also been successfully integrated with MDA activities in Central Nigeria with report of an increase in ITN ownership and retention. However, to take advantage of these programmatic links, more data on LF vectors is critical as there are many gaps in our knowledge as highlighted in the *Anopheles* database recently

compiled for Nigeria (Okorie, 2011).Integrating activities and combining resources across the various NTD programmes will also have many advantages. These issues are particularly relevant for Nigeria, given the large population at risk of *W. bancrofti* infection (Hotez, Asojo& Adesina, 2012).

Onchocerciasis

Onchocerciasis is also known as river blindness infects about 26 million people living near rivers and fast flowing streams of sub –Saharan Africa where Nigeria is located (WHO, 2012). Studies at Anaocha LGA Anambra State infections were found in all age groups, and it occurred mostly in older groups. This may be because older individuals have been exposed throughout their lives and that they are more exposed to the vectors because of their occupations, mostly as farmers in the fields, as opposed to the children who are attending school. The peak in biting in the late morning hours (Amazigo, Zoure, Njepuome, & Lusamba-Dikassa, 2012), thus coincides with adults being in their fields while the children are in school. First vector contact occurs when children visit streams to swim, to fetch water for domestic use or for other purpose in South-Eastern Nigeria, there are pockets of endemic foci, as shown by some reported studies although there is gross underreporting of the scourge (Uttah 2010). According to Nworgu, Ohaedbule, Onweluzo, Alo, Nweke, Agu & Eme (1994) the most significant area in this sub-region as far as onchocerciasis is concerned, is the hilly and undulating Udi-Enugu-Okigwe axis from where some rivers or their tributaries, supporting black fly vector breeding, have their origin. These include rivers such as Oji, Ajali, Mamu, Adada, and Imo (the biggest of them). Unfortunately, studies in this sub-region have been largely cross-sectional. There has not been any comprehensive study on all aspects of the infection; parasitological, clinical, and epidemiological.

Onchocerciasis is a severe and debilitating parasitic infection of global concern. Its prevalence and the magnitude of associated social and economic effects vary widely in different geographical areas where the disease occurs (WHO, 2012). About 90 million people are at risk of which 17.6 million are infected, including 326,000 people who have gone blind, in 34 countries of the world (WHO, 2013). In Africa alone, home to over 96% of all global cases, it has been reported in 26 countries (WHO, 2015).Onchocerciasis is perhaps the most studied filarial infection in Nigeria. The provisional estimates had suggested that 7–10 million Nigerians are infected with *Onchocerca volvulus*, approximately 40 million are at risk of the disease , and 120,000 cases of onchocerciasis-related blindness (WHO, 2013), with many thousands suffering from disabling complications of the disease . New foci of onchocerciasis are still being discovered and therefore its distribution could be far more extensive than has been earlier assumed (WHO, 2015).

In Southeastern Nigeria, there are pockets of endemic foci, as shown by some reported studies (Nworgu etal., 1994), although there is gross underreporting of the scourge. This report is the first emanating from this holistic study on meso-endemic onchocerciasis. It is aimed at assessing the prevalence and intensity of microfilariae of *O. volvulus*, and to compare the microfilariae and mf intensity of skin snips from the waist and shoulders of same individuals with a view to ascertaining the critical threshold for reliable sampling using the corneo-scleral punch.

More than 32 million Nigerians in 32 states and the Federal Capital Territory are estimated to be at risk for onchocerciasis. Nigeria accounts for nearly 40% of the world's burden of onchocerciasis (Hotez et al., 2012). Control efforts commenced in 1988 with prevalence surveys and pilot treatment project in Kwara state. Mass treatment with Ivermectin was initiated in 1991 and extended later to other endemic states with the assistance of UNICEF and other international organizations (Hotez, 2011). And in 1997, Nigeria started receiving support from the African Programme for Onchocerciasis Control (APOC) and commenced usage of the Community Directed Treatment with Ivermectin (CDTI) or ComDT (a TDR product) a concept from Community Directed Intervention (CDI).APOC was set up in 1995 to establish within a period of 12 to 15 years, effective and sustainable, community-directed treatment with Ivermectin throughout the endemic areas within the geographic scope of the programme, and, if possible, to eradicate the vector in selected and isolated foci, by using environmentally safe methods (APOC, 2013). It targets by 2010 is to treat 89,998,211 persons in one hundred and eleven projects. The Community Directed Treatment with Ivermectin (CDTI) health intervention is undertaken at the community level under the direction of the community itself of which the communities take charge of distributing health commodities themselves with guidance from the health service (APOC, 2013).

Schistosomiasis

Schistosomiasis, is also known as bilharzia or "snail fever," is a waterborne parasitic infection that damages internal organs. Schistosomiais is prevalent in tropical and sub-tropical areas, especially in poor communities without access to safe drinking water and adequate sanitation. It is estimated that at least 90% of those requiring treatment for schistosomiasis live in Africa (Van der Werf, 2003). In addition, there are at least 19 species of schistosomes, of which 5 are pathogenic parasites to humans including two forms that are common in Nigeria; the Schistosoma haemobium and Schistosoma mansoni. (Nwoke et al., 2006). People become infected

when larval forms of the parasite – released by freshwater snails – penetrate the skin during contact with infested water. In the body, the larvae develop into adult schistosomes. Adult worms live in the blood vessels where the females release eggs. Some of the eggs are passed out of the body in the faeces or urine to continue the parasite's life-cycle. Others become trapped in body tissues, causing immune reactions and progressive damage to organs.

Mode of transmission, Schistosomiasis mostly affects poor and rural communities, particularly agricultural and fishing populations (WHO, 2010). Schistosomiasis is contracted when a person has contact with contaminated water, often through daily activities such as bathing, washing laundry, and fetching water. Women doing domestic chores in infested water, such as washing clothes, are also at risk. Inadequate hygiene and contact with infected water make children especially vulnerable to infection (Federal Ministry of Health, 2012). The parasite can live for years in the veins near the bladder or intestines, laying thousands of eggs that tear and scar tissues of the intestines, liver, bladder, and lungs. It most commonly affects women and Middle -aged children, who come into contact with the disease during their daily chores or at play. Migration to urban areas and population movements are introducing the disease to new areas. Increasing population size and the corresponding needs for power and water often result in development schemes, and environmental modifications facilitate transmission. With the rise in eco-tourism and travel "off the beaten track", increasing numbers of tourists are contracting schistosomiasis. At times, tourists present with severe acute infection and unusual problems including paralysis.

In terms of socioeconomic and public health impact, schistosomiasis is second only to malaria as the most devastating parasitic disease in tropical countries. Nigeria is the most endemic country for schistosomiasis, with approximately 20 million people mostly children needing treatment (WHO, 2013). For communities already burdened by poverty and ravaged by scourges such as malaria and tuberculosis, schistosomiasis is especially devastating, weakening the body's resistance to other infections and preventing children from reaching their full potential. An infection with schistosomiasis can result in anemia, stunted growth and development of children, chronic debility, and sometimes premature death.

Soil-transmitted helminthes (STHs)

Soil-transmitted helminthes (STHs), also known as intestinal helminths or geohelminths, are a group of parasitic nematode-worms that causes human infections. Transmission is through ingestion of an infective egg (faecal-oral) as in *Ascaris lumbricoides* and *Trichuris trichuria* or penetration of an infective larva through the skin of a susceptible host (active penetration) as in hookworm (WHO, 2011) . They strive in warm and moist soil of the world tropical and sub tropical countries (Crompton, 1999; Chesbrough, 2006). It is reported that more than a billion people are infected with at least one species by swallowing infective eggs or infective larva penetrating the skin (Crompton, 1999; Maugire, 2005; Cheesbrough, 2006). Various geohelminthes of particular worldwide importance includes the round worms (*Ascaris lumbricoides*), whipworms (*Trichuris*. They are the most common STHs and affected children living in rural areas without portable water supply, poor health facilities, education and poor hygiene as it is in some poor nations of the world, to be chronically infected with the three worms (Crompton, 2001). Available data showed also, that STHs infections were high in some parts of Nigeria (Uneke, Eze, Oyipo Azu & Ali, 2007), other parts of Sub-sahara Africa, America, China and East Asia (WHO, 2012). Males have higher prevalence of STHs infections than females (Uneke et al., 2007) and age group 4-10 years has higher prevalence of STH infections than age group 10 years above (WHO, 2015; Uneke et al., 2007).

In Nigeria, intestinal helminthes infections have continued to prevail because of low levels of living standard, poor environmental sanitation and ignorance of simple health promoting behaviours (Nwosu, 1981; Udonis, 1984). School age children bear the greatest burden of these infections and such are faced with health burdens like malnutrition, stunted growth and intellectual retardation, as well as cognitive and educational deficits (Ukpai etal., 1999; Maguire, 2005; Chesbrough 2006). However, despite their educational, economic and public health importance, STHs remain largely neglected by the medical/international community and this neglect stem from three features: the people most affected are the worlds impoverished, particularly the poor; the infection cause chronic ill-health and has insidious clinical presentation and finally, because the quantification of the effect of soil-transmitted helminthes infections on economic development and education is difficult (Wakelin, 2002). The present review therefore looked at the implication of these neglected disease in Nigeria Health Education.

Implication for Health Education in Nigeria

Health education is a combination of learning experiences designed to help individuals and communities to improve their health, by increasing their knowledge or influencing their attitudes. According to WHO (2013) the major principles of health education is to educate people about health. Health comprises of different dimensions namely; physical, environmental, emotional, social, spiritual health. The prevalence of these neglected tropical diseases is affecting above dimensions of health in the endemic communities by blocking of the lymphatic channels, leading to swelling and eventual scarring of the legs, known as elephantiasis restricting the movement

of such person thereby affecting the physical structure and social interaction in the community and in men it leads to swelling of the scrotum, or hydrocele which reduce libido.

The implication for health education in Nigeria is that if health educator did not raise and create awareness in the inherent, causative agent/signs and symptoms, prevention, control, treatment or eliminating the burden of neglected tropical diseases in Nigeria. There will be no improvement in people's health status at the endemic areas and where an endemic population were not healthy the prevalence of those diseases will be high as such resulting into permanent disability and disfiguring as in the case of lymphatic filaraisis (elephantiasis/hydrocele), Onchocerciasis (river blindness/hanging groin), Schistosomiasis (liver/kidney failure, bladder cancer, Fibrosis of the bladder/urater, and kidney damage). In case of the three soil-transmitted diseases it usually leads to intestinal blood loss that can result into anemia, blood and protein loss, rectal prolapsed, and physical and cognitive growth retardation). It will be very difficult for the communities/individuals to believe that these signs and symptoms associated with these diseases are not a curse/witchcraft/anger from gods. In other to have effective and acceptable intervention for the endemic community, health education which includes advocacy, social mobilization and community sensitization should be at the center of planning of all health programmes.

Summary

This work focused on neglected tropical disease in Nigeria; implication for health Education. The paper saw neglected tropical diseases as a medically diverse group of tropical infections which are especially common in low-income populations in developing regions of Africa, Asia, and the Americas. They are caused by a variety of pathogens such as viruses, bacteria, protozoa and helminthes, unsafe water, poor housing conditions and poor sanitation. It is called neglected because government at the three tier level is not interested in such diseases and many people do not see it as priority to control it through prevention or by therapeutic method, health educators have not created enough information or awareness about those diseases for the population to become conscious of it and health agencies like WHO, UNICEF, USAID, Center for disease control (CDC), the Cater Center (TCC) have little report about such diseases in Nigeria. There are 17 different types of these neglected tropical diseases identified by WHO. Seven of these diseases are mostly affecting Nigerian but six were addressed with their implications for health education in this paper. They are lymphatic filariasis, onchocerciasis, schistosomiasis, and three soil-transmitted helminth infections (hookworm, ascariasis and trichuriasis).

These neglected tropical diseases affected the low-income populations in developing regions of Africa, Asia, and the Americas and children are the most vulnerable to these diseases, which kill, impair or permanently disable millions of people every year, often resulting in life-long physical pain and social stigmatization and it affects more than 1 billion people, primarily poor populations living in tropical and subtropical climates. It was discovered in this paper that many neglected tropical diseases can be prevented, eliminated or even eradicated with improved access to existing safe and cost-effective tools. Control relies on simple interventions that can be carried out by non-specialists for example school teachers, village heads and local volunteers in community based preventive action. According to the World Health Organisation (WHO) elephantiasis (Lymphatic Filariasis), is a neglected tropical disease. It occurs when a mosquito with infective stage larvae bites a person, the parasites are deposited on the person's skin from where they enter the body and migrate to the lymphatic vessels where they develop into adult worms in the human lymphatic system. The infection, according to WHO, is usually acquired during childhood, with the painful and profoundly disfiguring visible manifestations of the disease occurring later in life. The acute stage of the disease leads to temporary disability, but LF leads to permanent disability. It is important to note that in a communities where there are co-endemic infection as malaria/LF the use of ITN is advocated for prevention since they were all caurse by anophiline mosquitoes, there is also co- treatment in oncho/LF with abendazole & ivemectin once in a year Onchocerciasis, or river blindness, is caused by infection with a filarial nematode (*Onchocerca volvulus*) transmitted by infected black flies (*Simulium* spp.) that breed in fast-flowing rivers and streams. The adult worms produce embryonic microfilariae that migrate the skin, eyes and other organs. Microfilariae cause severe itching, disfiguring skin disease

It may enter the eye, causing visual loss and blindness over time. Schistosomiasis is a parasitic disease caused by bloodflukes of the genus *Schistosoma*. Two species of schistosomes are responsible for infection of humans: *Schistosoma haematobium, S. mansoni* and *S. haematobium* and *S.mansoni* are predominant causes of disease Human schistosomiasis manifests as intestinal and urogenital disease. Transmission begins human excreta containing parasite eggs reaches fresh water bodies and hatched larvae infect susceptible snail hosts. Parasites undergo asexual multiplication in snails and another larval stage, infective to humans, is released into water. People become infected during domestic, occupational and recreational contact with water. The distribution of the burden of schistosomiasis remains highly unequal. In the South Western part of Nigeria.

Soil-transmitted helminth infections are among the most common infections worldwide and affect the poorest and most deprived communities. They are transmitted by eggs present in human faeces which in turn

contaminate soil in areas where sanitation is poor. The main species that infect people are the roundworm (*Ascaris lumbricoides*), the whipworm (*Trichuris trichiura*) and hookworms (*Necator americanus* and *Ancylostoma duodenale*).

Conclusion

Realizing that neglected tropical diseases are insidious in nature the current approaches to the prevention and control of these diseases is by implementing an integrated manner of control measure across all relevant sectors. A large-scale preventive treatment against helminthiases and with safe, single-dose, quality-assured medicines to promote universal access to preventive chemotherapy should be in use. The Nation should have improve coordination for reducing transmission and strengthening control of neglected tropical diseases taking into account social determinants of health, through provision of safe drinking-water, basic sanitation, health promotion and education, vector control and veterinary public health. The country Nigeria taking into consideration, providing effective health education plan in all programs which will led to prompt diagnostic testing of all suspected cases of neglected tropical diseases

Effective treatment with appropriate therapy of patients in both the public and private sectors at all levels of the health system including the community levelis very important. Recognizing also the diversity of neglected tropical diseases, their causative agents, relevant vectors and intermediate hosts, their epidemic potential, and their morbidity/mortality and associated stigmatization in endemic states, local government, communities and villages should be provided with good Health education.

Recommendations

The following recommendations were made:

- The Community burden of the NTDs should be assessed by Government to develop integrated approaches and multi-intervention packages for disease control.
- Health-care systems and capacity building should be strengthened by both Government and non-governmental organization.
- Evidence for advocacy to promote prevention, treatment and control should be formulated by Government, private sectors and communities.
- Free and timely access to high-quality medicines and diagnostic and preventive tools should be ensured by Government and health agencies.
- Health educators should organized seminar/workshop to educate communities on the preventive measures and early detection of the neglected tropical diseases by the three tiers of government to ensure continued country ownership of programmes for neglected tropical disease prevention, control, elimination and eradication; by the three tiers of government/ community and to strengthen the disease surveillance system especially on neglected tropical diseases targeted for eradication; by the three tiers of government.
- To expand and implement, as appropriate, interventions against neglected tropical diseases by the three tiers of government/health agencies/community
- Nigeria should seek support from WHO's international partners, including inter-governmental, international and non-governmental organizations, financing bodies, academic and research institutions, civil society and the private sector in order to eradicate these diseases.

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