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Factors Influencing Prevention of Tungiasis Infestation in Tshiatsala Division of Butere Sub County – Kenya

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Abstract

Tungiasis infection is spread by sand flea (chiggers) burrowing human flesh, caused by *Tunga penetrans*. Globally, Tungiasis are associated with contaminated habitats of loam soils. In Kenya quality data on prevention and eradication of Tungiasis, remains unclear, as the infested community continues to disfigure their body limbs. It was these reasons that lead the study to determine factors influencing prevention of Tungiasis in Tshiatsala in Butere, specifically to determine how Knowledge, attitude and practice of community influence the prevention and

control of Tungiasis, elucidate how demographic, socio-economic and socio-cultural factors influence the implementation of control and eradication Tungiasis. Using case-study, primary schools pupils and infested adults were used in the study population, by purposive sampling in the holoendemicity. Formal survey, Key informant interviews and Focus group discussions were used to collect and analyzed data. Over 75% of pupil and adults have Tungiasis. Majority (80%) of infestation were due to enhanced poverty has indicated by, going to school bare feet, live in grass thatched or uncemented floors, rarely smeared with cow dung. Need for community to partner in health sector wide approach for permanent health remedy, such as means and ways to increase income to household, capacity building of community via health education and promotion using appropriate technology, these will enhance the achievement of sustainable global goal three .

Key words: Tungiasis Poverty, Sustainable, Holoendemicity, loam soils, Infestation

Introduction

Tunga penetrans causes Tungiasis infection after bite by mites also known as sand flea or chigger flea, burrowing in the human/animal flesh, are ecto parasite that cause direct transmission of chiggers does not occur instead poor sanitation is a reservoir for *Tunga penetrans*, vectors for the chigger flea even in domesticated animals, to reproduce, grow and invade various parts of the body, especially the phalanges, hands, elbows, neck, buttocks and the genitals. The first evidence of infestation by a chigger is the formation of tiny regular itching and black spot on the skin at the point of penetration, and since flea is a poor jumper, most lesions occur on the feet, often on the soles, the toe webs, and around or under the toe nails. Within the next few weeks, the papule slowly enlarges into a white, pea-sized nodule lesion, with well-defined borders between 4-10 mm in diameter [1-4].

In America, the sand flea was found in Haiti in 1525 [5-6]. The first scientific description dates back to the early 17th century by Aleixo de Abreu from Brazil [7]. *T. penetrans* came to Africa with ballast sand carried by a ship that left from Brazil to Angola in 1872, the parasite spread from Angola along trading routes

and with soldiers to entire sub-Saharan Africa [7-10]. In 19th century the sand flea reached East-Africa, Zanzibar and Madagascar [11]. In Kenya the prevalence of sand fleas are distributed in patches though out the country with dark loam soils. However, the spread of chigger in western region is not well documented though the infestation remains a big challenge. It was these reasons that find it necessary carry out case study in Tshiatsiala- Butere to determine factors influencing quality prevention and eradication tungiasis'

T. penetrans burrows its head first into the hosts' skin, often leaving the caudal tip of its abdomen visible through an orifice in a skin lesion. This orifice allows the (chigger) sand flea to breathe and defecate while feeding on blood vessels in the cutaneous and subcutaneous dermal layer. In, abdomen, the caudal orifice to fall to the ground when ready to hatch, then dies and is sloughed off with the host's skin, within the next three to four days, the eggs hatch and mature into adult fleas within three to four weeks.

According to literature [12], myths about chiggers infection are holoendemic are common among the low incomers population in the community because have limited resources to buy foot wear, cement floor, thus most pupil go school on bear feet thus promoting infestation. In Brazil which is characterized by economic depression where 60% of the population has a monthly family income of less than two minimum wages (1 minimum wage =US\$80.00), Waste and sewage disposal are insufficient and hygienic standards are very low. This area is built on a sand dune close to a beach. Adult illiteracy is 30%, unemployment rates are high and crime is common. Many houses are made of improvised construction material and do not have concrete floor thus socio economic status of these population is limited to promote eradication or control of Tungiasis holoendemicity. Though the socio-economic standards of Tshiaslala division are similar with these of Brazil challenges, Butere region in Kenya has undocumented data to elucidate that.

In social cultural concepts, communities associate Tungiasis holoendemicity, with

everyday life and hence did not consider visiting a medical centre for treatment to be worthwhile [4]. When a community feels that there is no need to seek medical care when they are infested by the chigger fleas, it shows a poverty stricken community and remains unexplained in Butere ,Kenya.

Health education / promotion emphasizes do not only prevention of holoendemic disease but also promotes positive good health seeking behaviors by using community's appropriate technology to improve on bad social cultural that hinder the eradication and control of Tungiasis, in regards to the Ottawa charter, community has a major leading role to play in their own action towards destroying unfavorable environmental conditions that provide a conducive environment for the chiggers to breed.

Knowledge, attitude and hygienic practices of households' health influence implementation health promotion can be used to help enable health population to increase control over and improve their health [13]. Which remain unexplained in Butere, Kenya? It was for these reasons that study aims to determine factors influencing prevention and control *Tunga penetrans* infestation among primary school pupils and adults in Tshiatsala division of Butere Sub County.

Literature Review

Socio-Economic Factors Influencing Prevention and Eradication of Tungiasis

Tunga penetrans is the smallest flea species measuring 1 mm they are blood-feeding, [14] , but eventually the female sand fleas penetrate permanently into the skin of its hosts and undergo an important hypertrophy, expelling hundreds of eggs during a period of two to three weeks. During penetration the hypertrophy of the flea's abdomen begins, and after some days the abdominal segments reach the size of up to 1 cm. After expulsion of the eggs, the involution of the lesion begins. About three weeks after penetration, the fleas die and eventually are sloughed from the epidermis by skin repair mechanisms [15]. Globally Studies have revealed that the greatest burden of chigger infestation lies on children aged 3 months-14 years with a decline

among adults and an increase among the elderly. This is due to the fact that children lack shoes as well as their inability to remove the fleas promptly from their feet. Lack of shoes is a major predisposing factor because the Chiggers mainly attack feet and beneath toe nails. In addition children are also more active than adults hence they have a practice of playing in the sand and dusty places which may harbor the fleas. On the other hand the elderly are less active hence they stay at one place for long giving the flea enough time to embed itself on the human skin. In addition the young and the elderly may not regularly take bath which places them at risk of attack by the fleas. It is also noted that the young and elderly suffer from jigger infestation the most because they possess very soft skin that is easily penetrated by the jigger flea [3].

In Kenya chigger menace does not know age boundaries. Its effects cut across all ages. However, most death cases due to chigger infestation have been reported among the young children and the elderly. For example in Muranga which is a region that is heavily infested with chiggers, in a family of eight children a child was reported dead due to the effects of chiggers. Furthermore cases of school dropouts have been widely reported in various parts of the country with Teso recording 500 cases of school dropouts while Muranga recorded 50% of children infested miss out of school due to the chigger menace. In Gitugi location, 700 school going children had been infected from 13 primary schools. Children bear the heaviest brunt of the deadly bug as they can no longer walk to school and find it difficult to concentrate in class. In Kiangage primary school, children from poverty stricken homes have greatly been attacked by this bug. These pupils not only contend with excruciating physical pain but also with the ridicule of their fellow pupils. In Tshiatsala division, the chiggers have greatly affected children as evident from the 500 school drop outs from six primary schools [1].

In Tshiatsala division, community live in close proximity with domesticated animals such as dogs, cats, goats and chicken which become vectors of the chigger flea. This may be attributed to lack of adequate land for rearing the animals, fear of theft or cultural practices owing to poverty, poor personal hygiene, lack of sanitary conditions and lack of basic services, chigger

menace has continued to wreck havoc in among the residents [1].

Other socio-economic factors influencing the low uptake may include, illiteracy, the type of Water supply, and the use of soap, may be explained by an indirect relationship with Tungiasis. For example, families with better access to water and using soap are prone to better hygiene standards. In addition, Tungiasis can be regarded as a poverty-associated disease, and improving sanitation and waste collection have been discussed as factors to reduce the incidence of Tungiasis [7]. However, the effectiveness of these measures is difficult to predict, and they are more costly than cementing floors of houses, confining pigs to pigpens, and realizing health education. Similar to our results, the use of insecticides inside houses has been described as a protective factor in the Brazilian study.

Adult illiteracy in study area is 30%, unemployment rates are high and crime is common. Many houses are made of improvised construction material and do not have concrete floors. This may be attributed to lack of money to buy better housing materials. Most streets are not paved with numerous stray dogs and cats roaming in the area in addition to dogs and cats kept as pets. During the high transmission season (July-December), it was reported that approximately one third of the population was affected by Tungiasis. Few cases of chigger infestation have been reported in developed communities due to increased poverty travel and migration across continents.

Regionally chigger infestation is a major health challenge in resource poor communities such as the rural parts of Nigeria like Erikiti village, Tanzania, North West Cameroon, Uganda and Burundi with its prevalence especially in resource poor communities approaching 50%. A study that was conducted in Erikiti a small poor community in western Nigeria revealed that 45.2% of the 557 people examined were infested with *Tunga penetrans*. [16].

It is associated with poverty as most cases of Tungiasis have been reported in resource poor communities where basic services such as sanitation, health facilities, poor housing and

domestic animals living in close proximity to where human beings live and lack of footwear or wearing of open shoes. Poverty as seen in most of the resource poor communities contributes a bigger percentage of Tungiasis. In such communities where there is lack of appropriate urban services such as health facilities, piped water and sewage systems, electricity as well as poor houses that are not cemented become suitable habitats for jigger fleas.

In Tanzania 88.5% of the residents survive on less than US\$ 1.25 per day hence most houses are built from improvised construction materials, houses are characterized with dusty floors and improving hygiene and purchasing shoes is not available options. In Tanzania only 2 % of the poorest 40% of students reach secondary school which greatly impact on earning capacity and opportunity by up to 181%. The key assets of rural families in Tanzania are their own labour and education both of which perpetuates the vicious cycle of poverty and jiggers [17].

Tungiasis is reported to be epidemic in Uganda because it has affected residents of twelve districts namely Busoga in eastern Uganda, central Uganda, Jinja, Kamuli, Mayuge, Luuka and some parts of rural Uganda among others. The common factor in these communities is poverty and lack of basic services, lack of shoes poor earth floors, and electricity which is a major predisposing factor to jigger infestation.

In Basoga, exposed dirt walls and compounds common among villages in Uganda owing to poverty, provide suitable environment for jiggers eggs to incubate inside homes. In addition. Lack of access to health facilities also plays a role in perpetuating the vicious cycle of jiggers and poverty. Tungiasis is a disease of the poor” [13].

In Kenya, chigger menace is observed to affect economically disadvantaged communities. In Muranga owing to poverty, people live in close proximity with domesticated animals such as goats, dogs, cats and chicken. Animals are major carriers of fleas, ticks and jiggers. As a result, people are heavily infested with jiggers and are living at the mercy of

Chiggers. This is evident from the pathetic housing conditions which are single roomed and shared by all the members of the family irrespective of the family size. In addition to poverty, poor people living in unhygienic conditions get chiggers because of the unsanitary nature of the dwellings. The impact of the infestation is low economic activity among such people. This renders the poor unable to rise out of poverty or makes them even poorer and end up being trapped by the vicious cycle of poverty. This vicious cycle of poverty triggers further infestation and may trap people in poverty for a long time unless timely and appropriate intervention is made to break the cycle [1].

In Tshiatsala division, poverty is the main cause of chigger infestation, in this division people live in extreme poverty that even affording good housing is a problem [9]. Most homes have small grass thatched houses with dusty floors that are overcrowded by all the family members of a household. Since jigger fleas thrive very well in dusty floors, these provide a suitable habitat for their multiplication. Moreover the victims are unable to afford shoes hence their feet are left exposed to the environment with chigger fleas which end up burrowing in their exposed feet as well as other parts of the body. The victims of chigger infestation are incapacitated and have their limbs deformed, consequently they are unable to work and even afford a meal as well as walk to school.

Socio-Cultural factors influencing Tungiasis among Primary Pupils

Prevalence was highest in children, decreased in adults and increased slightly in the older population. The results from the same study showed that the prevalence of Tungiasis in males stood at 59% as compared to their female counterparts' who had a lower prevalence and it stood at 47%. The results of the study conducted by Collins *et al.* ,2009 [4] concurs with the results from a number of Community-based studies that have consistently shown a prevalence of between 16and 55% in typical endemic areas with a peak of age-specific disease occurrence in children 5to 14 years and the elderly, and a preponderance of infestation in the male sex [8].

The distribution of prevalence by age follows a characteristic curve. It is perhaps not surprising that the recorded prevalence in children was greater than in adults since many aspects of the culture, traditions and way of life of the people place children more at risk. If worn at all, footwear seldom covers the entire foot, open shoes such as sandals and flip-flops, or indeed damaged shoes, are the most common footwear. Children are often left to play in the dry, sandy courtyard, where villagers walk through and spread the eggs of the flea [8].

A significant difference in prevalence has been observed between the sexes, much like a study in Trinidad [18]. This finding, however, has not been consistent among all studies and appears to vary from one population to another. Research in Nigeria and Brazil found no statistically significant difference between the sexes [7,8] while it was observed a greater prevalence in females than in males. These data differences are likely to be related to exposure and environmental factors, rather than differences in susceptibility. The culture of rearing animals is a common practice in the African set up. In as much as there are benefits in keeping the animals, the animal reservoir plays an important role for transmission dynamics

It is known that the animal reservoir plays an important role for transmission of holoendemic in communities. In particular, dogs, cats and rats have been described to be commonly infested [19], and several authors reported severe disease in pigs from different African countries, such as from Saõ Tomee, Zaire, Cameroon and Tanzania [7,17]. These studies emphasized the importance of pigs as animal reservoir of *T. Penetrans*. Our data suggest that the presence of pigs on a family compound is an important predictor for human Tungiasis and those pigs may be the most important animal reservoir. Surface spraying with insecticides has been claimed to be effective, but there is no controlled study to confirm this assumption [16], and due to the particular biology of *T. penetrans*, environmental application of insecticides may not be effective [16]

Tungiasis is highly prevalent in humans and domestic animals. In particular, it underlines the importance to include animals in control operation aiming at the reduction of disease occurrence in the human population [7].

Globally households infested with jiggers are characterized by beliefs such as chiggers are known to have occurred in Latin America and Caribbean and it was inadvertently introduced into tropical Africa in 1872 by a load of infected ballast sand on board the ship *Thomas Mitchell* travelling from Brazil to Angola. Thereafter *T.penetrans* spread rapidly along the West Coast and subsequently throughout the sub-Saharan region. This ectoparasite then followed trade routes and was propagated through military expeditions and reached East Africa and Madagascar within 20 years. By 20th century, the parasite had reached the Indian subcontinent and thirty years down the line, the first case of the parasite was reported in New Orleans in the United States. Besides the parasite being towed by one of the ships, jiggers are also believed to have been imported to the United States by travelers who toured the tropics and returned with a mild form of the disease where the patients showed only one or two lesions. In contrast, previous observations showed that the indigenous populations as well as the immigrants to the United States had the jigger flea.

While in Fortazela, Brazil households believe that chiggers arise due to social neglect i.e. poor personal hygiene and inadequate healthcare. In this region Waste and sewage disposal are insufficient and hygienic standards are very low. Most streets are not paved with numerous stray dogs and cats roaming in the area in addition to dogs and cats kept as pets. There are many rodents such as *Rattus rattus* which are seen during the day feeding on organic waste disposed of in the backyards or outside family compounds. During the high transmission season (July-December), it was reported that approximately one third of the population was affected by tungiasis. Furthermore tourists visiting Lake Tanganyika had the practice of walking bare feet in the beach and on returning to Australia, noticed that they had jiggers in their feet. The jigger flea is common in the Caribbean, Latin Asia. In addition Tungiasis is known to be a Zoonotic disease that affects other animals as well. Currently the main hosts described in decreasing order of

prevalence and importance was human, dogs, pigs, and Cats. The chigger infestation was most prevalent in humans with 54.4% (132 infested individuals out of 241 examined and 61% (75 dogs infested out of the 123 dogs examined. This findings shows that dogs represent the potential infestation source to humans and it was therefore suggested that the infestation on man is supported by a large population of stray dogs hence it was recommended that the population of dogs should be controlled and treated in order to reduce human infestation by chiggers [7].

While other communities in Tanzania believed that, chigger problem started in the 20th century when members of Kibondo district started interacting with foreign Indians. Other members of the community believed that chiggers were caused by witchcraft and therefore people should be careful with the way they deal with each other lest they become victims of jiggers. The Maasais in Kioge Village Tanzania believe that jiggers are a bad omen. Furthermore the Basoga community of Eastern Uganda believed that jiggers were brought into the country by Indian laborers brought from India by the British Colonialists to construct the Tanzania, Kenya, Uganda Railway line and thereafter settled in Eastern Uganda among the Basoga community while finishing the construction, they transmitted the parasites to the Basoga Community. However some of the victims of jigger infestation in rural Uganda think they are bewitched and that is why they are suffering from jiggers. So many of those affected end up seeking treatment from traditional healers instead of seeking conventional health care givers.

In Kenya there have been different theories about the origin of chiggers. According to some elderly people, chiggers were brought to the country by colonialists as a biological warfare, to defeat the enemy. The jiggers were fed on substances that cause mental retardation to human beings. Whereas another theory explains that Tungiasis is a Zoonotic disease that affects a wide range of domesticated and peridomesticated animals such as dogs, cats, pigs and rats. Human beings living in close association with such animals are at greater risk of infection. In central parts of Kenya, the residents of Muranga in particular believe that jiggers are caused by witchcraft and curses. Their attitudes have hampered progress against jigger eradication by Ahadi Kenya. The

government has a culture of treating the jigger issue as a social problem and not medical. As a result when jigger victims seek medical attention from hospitals, they are treated for other ailments but the jigger infestation is left untreated [1].

In Tshiatsala division, even though chigger infestations are generally thought of as a thing of the past, the infestation is a nightmare in several remote regions of the Division. Chiggers are believed to live in dusty conditions and other unhygienic environments, and are generally associated with poverty-stricken populations. In addition, the community has a cultural believe that chigger infestation is as a result of witchcraft and curses and therefore the jigger victims do not bother to seek medical attention but live at the mercy of chiggers and only wait for their fate. Many of the victims have therefore died due to jigger infestation and several others are suffering in silence and are not aware that the condition is treatable. A number of children have had to drop out of school because they are unable to walk. In addition to this, there is a stigma that surrounds chigger infection as it is often considered an irreversible curse, and children are ridiculed and isolated by their peers [6].

Influence of knowledge Attitude and Belief of Households on Tungiasis infection.

The knowledge on the ectoparasitosis occurs in underdeveloped communities in the rural hinterland, in fishing villages along the coast and in the slums of urban centres. Similar to many other parasitic diseases, the occurrence of severe Tungiasis is linked to poverty [7]. Interestingly, *T. penetrans* is one of the few parasites which have spread from the western to the eastern hemisphere. The sand flea has been introduced several times in the 17th, 18th and 19th century to West Africa as a result of the slave trade; however, the flea did not spread over the continent and disappeared after some time [15]. Finally, *T. penetrans* came to Africa with ballast sand carried by a ship that left from Brazil to Angola in 1872. Within a few years, the parasite spread from Angola along trading routes and with soldiers in the entire sub-Saharan Africa [7]. At the end of the 19th century the sand flea had reached East-Africa, Zanzibar and Madagascar [20], Due to high prevalence of the parasite among human beings in

Bananeiras community a study was conducted on request by Araruama municipality state of Rio de Janeiro to evaluate an epidemiological survey, pattern and develop possible solutions to reduce the prevalence of disease and its negative impact on the local populations' health.

All humans were examined by clinical and macroscopic examination in order to diagnose and count the chiggers embedded on the exposed parts of the body. The domestic animals were also examined and the fleas counted. This study confirmed the presence of *Tunga penetrans* infestation widely distributed throughout the locality among various hosts. The overall prevalence was 49.2% (211 infested hosts out of the 429 examined). Due prolonged negative attitudes on prevention and control of Tungaiasis, Ahadi Kenya has launched anti-jigger campaign both in Kenya and Uganda in collaboration with Hope of Ray Community organization to help in treating the victims who were badly infested on their legs, hands and other parts of their bodies. The residents claimed that many people have suffered jigger infestation without knowing the solution to challenges that hamper global goals achievements Global goals [9].

The conceptual framework depicted on the health belief model which state that community will only seek for a health service care only if they are sure of the accrued benefits.

Methodology

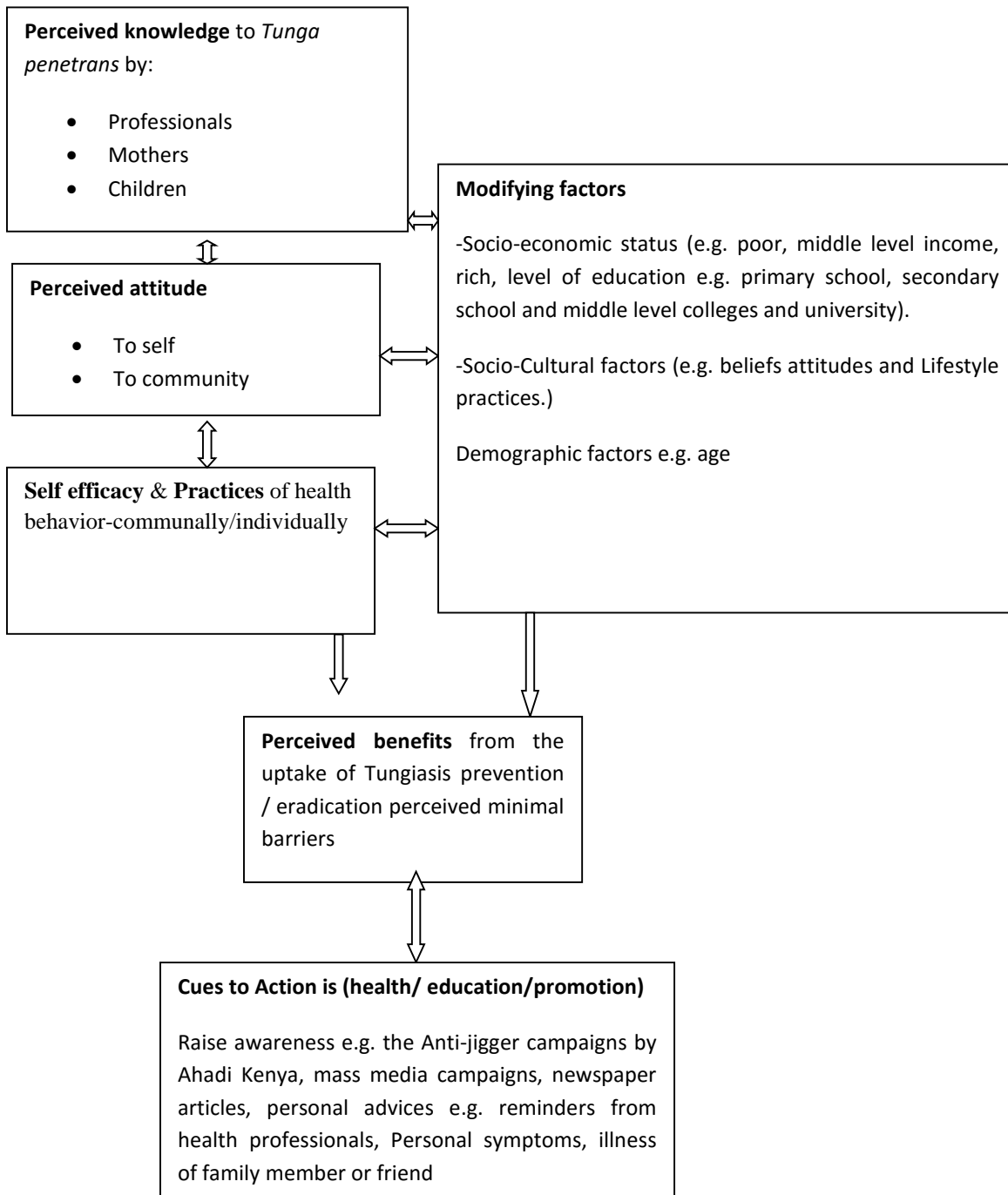
Study design

Purposive case study was used to study of individual respondents, (pupils and adults) the aspect of the subject's life and history was analyzed and can then generalize

Study Area

The study area was Tshiatsala division in Butere of Kakamega County Kenya. Butere covers an area of approximately 270 sqkms, has a population of about 203,000 people and over 25,500 households. It is divided into three division's i.e Tshiatsala, Lunza and Ibokola

Health Belief Model



Source: (Stretcher, V., & Rosenstock I.M. (1997)

The Sub county borders Mumias, Khwisero, and Siaya. The mean annual rainfall ranges between 1270mm and 1790 mm. Long rain season is between March and May while short rains are in August and October.

Study Target Population

The target population were primary school pupils and infested adults households.

Sampling design

Purposive sampling of the division which was severely infested with chiggers, Marama south location, study schools were identified sampling frame from the district public health officer. Respondents comprised of pupils, teachers and parents from the neighboring community from where the children come, public health officers, community health assistants (CHAs) and community health workers (CHWs) from Marama, area identified, as highly infested with chiggers.

Data collection Tools

Questionnaires

In formal survey, structured questionnaires written in English were used to interview mothers, of pupils and teachers they were translated to luhya language and then back to English by research assistants to ensure accuracy. The researcher employed knowledgeable research assistants who were able to do the translations to luhya and back to English. And Kiswahili

Key Informant Interviews (KII)

KIIs were organized into themes which included demographic, economic and cultural practices and believe, administered to head teacher, community health workers and assistant chiefs

Focused group discussion Guide

. FGDs were conducted among women group of 13 discussants, in the affected pupils because they had not attained age to be researched on according to law of the land.

Data analysis

Data was processed through cleaning of the questionnaire manually and thoroughly counter checking for completeness and correctness. FGD, themes were discussed to saturation and repeated in KII to ensure efficiency and accuracy. Audio recorded tapes were transcribed and coded based on the emerging themes and sub themes.

Ethical considerations

Permission was granted from the ethical review from the institute of education and from Butere District public health officer. Since pupils are under age consent was sought from their Teachers parents and guardians. Participation in the study was voluntary and participants were allowed to stop participating any time they did not wish to.

Findings and Discussion

Findings

Socio-Economic Factors Influence on Prevention and Eradication of Tungaiasis

From the study, Majority respondents (80%) are overwhelmed by sand flea infestation are low income households leading life of below half a dollar consumptions per day, whose holistic economic life time wander in great poverty of vicious circle, go to school bare feet, their house were not cemented or live in grass thatched houses with dusty floors which are rarely smeared by cow dung.

During Key informant interviews with most of Community health workers too concurred, that Tungiasis affect those who live in extreme poverty, due limited resources to access sanitary and hygiene services example, cannot afford shoes and are not in position to build permanent houses are the most infested. To them age is a factor since chiggers affect children

between 2 to 15 years and the old age (60 and above) . The mentally sick individuals are also highly susceptible to the chiggers. Most households in the affected community are peasant farmers who are either illiterate or semi illiterate

The affected respondents stay in grass thatched houses

See my house it is a mud house and poorly maintained because I am busy trying hard to get food for my children. I also I keep dogs for my security and I don't spray them because I don't have money.”FGD discussion with mother on 23/6/2015

Orphans aged 3 to 15 years and especially those who live with grandparents are more vulnerable to jiggers. They also mentioned that those who live in existing poverty where by even affording soap for bathing was a problem were vulnerable including those who live in temporary shelters (mud houses) which are not maintained properly. Alongside these Low education level also contributes to the spread of jiggers. KII interview with some of teachers in primary school. On 22/06/2015”

Socio-Cultural factors influencing Tungiasis infection among primary pupils

The study discovered how diversity of cultural beliefs towards *Tunga penstran* infestation, as the main obstacle in the achievement of sustainable development (global) goals number: 1, **no poverty**.3, **good health and well being** 4, **quality education for primary pupils**. Result that came out in various (KII) key informant interviews and (FGD) focus group discussion:

There is a myth that an individual affected with jiggers ends up being rich “it is a gift of wealth “and to some it is inherited. Some people do believe that they have been bewitched when affected by the jiggers to some it is a curse or rather demons. ‘I believe it is a curse.’ In a number of FGD discussion with pupils from different schools on 20th Of June 2015.

CHWs (community health workers), encounter challenges efforts to eradicate or control chiggers due to the existing beliefs in the society,

'we find it a challenge dealing with jiggers because some say it is accurse it is inheritance and its brought by witchcraft while others belief that eventually it brings wealth' KII interview with CHW 20th of June 2015

Influence of Knowledge Attitude and Practices of Households on Chronic Tungiasis

The results showed that only a few (40%) of respondents have correct knowledge, attitude and practices towards the prevention and eradication of Tungiasis if given sustainable resources to fight against poverty cycle in the vicious cycle which is the main root cause of the enhanced and chronic Tungiasis.

Discussion

Socio-Economic Factors Influence on Prevention and Eradication of Tungiasis

From the study, Majority of respondents (80%) are overwhelmed by sand flea infestation due to the prevailing poverty from the majority poor population, whose holistic economic life wander in great poverty of vicious circle, go schooling bare feet, their house were not cemented or live in grass thatched houses with dusty floors, rarely smeared by cow dung. Similar to a study by Wangui, 2008 [19], on indicators of poverty and , Alfred, 2009 [2] from Baringo, Kenya.

Community health workers too concurred, that Tungiasis affect those who live in extreme poverty, due limited resources to access sanitary and hygiene services example, cannot afford shoes and are not in position to build permanent houses are the most infested. To them age is a factor since chiggers affect children between 2 to 15 years and the old age (60 and above). The mentally sick individuals are also highly susceptible to the jiggers. Most households in the affected community are peasant farmers who are either illiterate or semi illiterate [11].

Socio-Cultural factors influence on Tungiasis

The studies discovered different cultural and belief towards *Tunga penstran* infestation, which will hinder the achievement of sustainable global goals number: 1, *no poverty*.3, *good health and well being* 4, *quality education for primary pupils*. Challenges continue to infect population due to cultural difference and beliefs are similar to health challenges encountered in the study by Collins *et al.* [4].

Influence of Knowledge Attitude and Practices of Households on Chronic Tungiasis

The results showed that only a few (40%) of respondent have correct knowledge, attitude and practices towards the prevention of Tungiasis but because of the enhanced poverty cycle of vicious cycle, curse beliefs and limited accessible to resource they may not achieve the target of eradicating or controlling Tungiais. Similar to Collins *et al.* [4], study of the neglected infection in rural community.

Chiggers control programs or activities being done by community sensitization of the community which done by community health workers. Outreach programs by ministry of health which collaborates with community health units that comprise the community health workers. Which is contrarily to Ottawa charter, which states that community need to do capacity building for their own health benefits and own health problems before involved them in their prevention and eradication measures.

Conclusion

Main challenge phasing eradication and control of *Tunga penstran* in Sub Saharan countries: are long term limited access to equitable, sufficient and efficient resources toward the achievement of sustainable (global) goals ,1, *no poverty*.3, *good health and well being* 4, *quality education for primary pupils by 2030 and beyond* However the underlying cause of low marked prevention and eradication of *Tungaiasis* in Tshiatsala in Butere Sub- County – Kenya like other Africa countries is due to enrooted poverty life among households.

There is need for community to participate in solving their health problems for achievement of global goal 3 of good health and wellbeing of households free from pathologic effect of *Tunga penetrans*

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