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Analysis of the Extent of Jigger Infestation among students in Public day secondary schools of Bumula sub-County, Bungoma County, Kenya

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ABSTRACT
Jigger infestation is still posing a major threat among public day secondary school-going students of Bumula Sub-County. Jigger infestation causes pain, discomfort, and severe cases of disabilities to students, thus denying them the opportunity to go to school. The study sought to determine the extent of jigger infestation among school-going students in public day Secondary schools of Bumula Sub-County, Bungoma County, Kenya. The study used Ecological Systems theory and adopted a mixed-method research design. The study targeted 10,000 students between 15-20 years from public day secondary schools. A sample of 370 students was obtained from the study of the target population using Krejcie and Morgan's 1970 formulae. The study purposively sampled 20 Key informants including community health promoters, head teachers, and local Chiefs to participate in the study. The study employed primary data which was collected using structured questionnaires and interviews. Secondary data was collected by studying the progress records, attendance registers, and end-term report forms. Data was analyzed using SPSS version 27 to determine the findings of the study. Data was presented in frequencies, graphs, tables, and charts. The study results revealed that there are high cases of jigger infestation among students in schools, with 88% of the respondents indicating they know someone with jigger infestation in their school. The study recommended that schools establish and strengthen health clinics and conduct regular check-ups on students to identify and address the issue. Schools to further collaborate with communities to maintain clean surroundings and engage parents and community leaders through health campaigns to ensure a holistic approach to preventing jigger infestation. Should these findings be adopted by relevant stakeholders, they will inform policymakers, teachers, parents, and the community in managing and mitigating jigger infestation in public secondary schools.

Key Words: Bumula, Bungoma, Jigger infestation, Public day secondary schools, Students

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I. Introduction

According to Michael *et al*, (2018), the persuasive issue of jigger infestation exists worldwide with varying degrees of incidences and a prevalence of up to 50% and it has been known to be a public health concern in poor rural communities in developing countries. Without prompt and comprehensive intervention strategies addressing the root causes of jigger infestation, it threatens the educational opportunities of children in the affected regions of the world. When children are affected, it reduces school attendance because of physical pain and discomfort, thus perpetuating the cycle of poverty and limiting opportunities for personal development. In addition, it is also believed to hinder progress and development.

Maco *et al*, (2011), assert that jigger infestation is caused by female parasitic fleas (chigoe, chigger, or Tunga penetrans), by penetrating the skin of the host. It is believed to have caused lesions to many people in Pre- Hispanic America and the West Indies, especially during the 14th Century. It was transported to Eastern Hemisphere by transatlantic Voyages, during the first half of the 19th century AD. Wolf *et al*, (2017), assert that, more than 6.5 million children in the United States miss school each year. The rates of chronic absenteeism vary between states, communities and schools, with disparities based on income, and race. Absenteeism puts students at risk for poor performance and school dropouts as well as poor long-term health. Students fail to attend school due to illness caused by parasites, and unsafe conditions.

According to Obebe (2020), Jigger infestation has received little attention in many sub-Saharan African countries. The prevalence of the infestation in Sub-Saharan Africa (SSA) was 33.4%, while infestation prevalence was 46.5%, 44.9%, 42.0%, 37.2%, 28.1%, 22.7% and 20.1% for Ethiopia, Cameroon, Tanzania, Kenya, Nigeria, Rwanda, and Uganda, respectively. The risk of jigger infestation was associated with gender, participants' age groups (4-15 years and ≥60 years), earthen floor, non-regular use of closed footwear, contact with domestic animals, and residence in rural areas.

Further, MOH (2017), estimated that 6 million people in Uganda are at risk of contracting the infestation. Three million already are infected with Tungiasis, 50% are in an endemic region of Busoga and the rest are distributed in regions of Karamoja and Central Sub-regions of Uganda. According to Adriko (2022), in Busoga region Uganda, the prevalence of Tungiasis caused by jigger infestation was 40.6% and the risk factors associated with poor hygiene and sanitation, people sleeping in mud houses, poor disposal of wastes around their compound and sharing residential houses with domestic animals. He adds that burdens continue to escalate with high school dropouts, absenteeism, poor academic performance, and low self-esteem.

In Kenya, MOH (2022) estimates that at least 10 million Kenyans spread across 42 Counties are at risk of jigger infestation if no efforts are made to eradicate the parasite. It has a major socio-economic impact as it immobilizes victims and renders them economically unproductive. It also hurts the educational sector as it affects the rate of children's school attendance, performance in outdoor activities, and general retention. In addition, 2.6 million Kenyans suffer from Tungiasis resulting from jigger infestation that is school children, aged, mentally and physically handicapped are the most affected by jigger infestation. Children are forced to drop out of school while others become economically unproductive, they lose their dignity and self-esteem (MOH, 2022).

According to Matendechere (2020), many individuals have been suffering from jigger infestation in silence. No comprehensive survey was carried out, making it challenging to give the actual number of those affected. In addition, poverty and a lack of proper hygiene are the leading causes of jigger infestation in Kenya. For example, eight Counties have reported cases of jigger infestation including; Murangá County, Bungoma, Busia, Siaya, Kakamega, Marakwet, Migori, and Nairobi County.

For instance, in a study by Kimotho *et.al* (2015), in Murangá County, Kenya, on managing communication surrounding jigger infestation stigma, this study revealed that jigger infestation relates to the issues of stigma and discrimination. Some families have struggled for years with severe infection, so he recommends alternative stigma management techniques for the community as well as interpersonal communication strategies.

In Migori County, for instance, jigger infestation is endemic among school-going children with a prevalence of 33.2%, this lowers school attendance and retention rates. This showed that children are at greater risk of factors associated with jigger infestation including mud-walled houses, living in dusty environments, and walking barefoot. Individuals that were infested with jiggers were separated from others. This increased stigma and psychological issues among children infested, thus causing them to miss school (Magento, 2017).

However, the available study highlights the issue of low school attendance rates both globally, nationally, and within specific regions of Sub-Saharan Africa and Kenyan regions. Despite various efforts to improve access to education, factors such as poverty, lack of infrastructure, health-related issues like jigger infestation, and distance to walk to school hinder educational opportunities for children, particularly in rural communities. It is against this background that the current study sought to analyze the extent of Jigger Infestation among students in public day secondary schools of Bumula sub-County, Bungoma County, Kenya.

1.2 Statement of the Problem

The issue of school absenteeism is a crucial part that contributes to low school attendance in various parts of the world. Health-related issues, disparities in income, and jigger infestation are some of the factors that contribute to low school attendance. Despite various guidelines and control measures provided by the Ministry of Health to curb jigger infestation, it is still posing a threat to students when they are infested as it causes pain, deformities, social effects, and psychological effects making it difficult for students to attend school in public day secondary schools of Bumula sub- county, Bungoma County, Kenya, thus causing them to lag behind others, (causing them to repeat classes more than once).

There still exists a gap in achieving, the national education goal of ensuring inclusive and equitable quality education and promoting lifelong opportunities for all, this is also linked to SDG goal number four of quality education, goal number one of no poverty, and goal number three of good health and sanitation. To achieve these goals, in Bumula sub-county, there is a need for schools and communities to tackle the problem of jigger infestation. Therefore, this study sought to fill the gap by analyzing the extent of jigger infestation on attendance and retention rates of students in Bumula Sub–County, Kenya.

1.3 General objective of the study

The main purpose of this study was to analyze the extent of jigger infestation among students in public day Secondary schools of Bumula Sub-County, Bungoma County, Kenya.

1.4 Research Question

i. What is the extent of jigger infestation among students of public day Secondary schools of Bumula Sub-County, Bungoma County, Kenya?

II. Literature Review

2.1 Jigger infestation and attendance Rates

According to Gubbles *et al,* (2019), on risk factors for school absenteeism: A meta-analytic review, revealed that School absenteeism and dropout are associated with many different life-course problems that lead to low school attendance rates. 75 studies worldwide reported 781 potential risk factors for school absenteeism and 635 potential risk factors for dropout. Some of the factors include negative attitude toward school, low parental involvement, experiencing learning difficulties low academic achievement, adverse family experiences, and child mental health. These factors contribute to economic derivatization and different mental, social, occupational, and illiteracy in adulthood. Based on the findings mentioned above, it does not establish how jigger infestation has influenced school attendance rates.

In another study by Chrine *et al,* (2020), on a critical analysis of factors accounting for low pupils' attendance in public primary schools in Zambia. Found that school environments such as classrooms, sanitary facilities, and desks were not available in equitable qualities to guarantee service quality and motivate learners. Socioeconomically, poverty was among the prominent factors inhibiting learners' effective progression. This effect resulted in the overall increase of number of children out of school from over 195000 in 2015 to 800000 in 2019. Thus, increasing low attendance rates of pupils. The present study acknowledges the above study in that it gives statistics on the increased school absenteeism and dropout rates which shows it as a problem that needs to be addressed.

Omolo (2013), investigates the socioeconomic factors influencing public secondary school students' dropout in Rongo District. The descriptive design which involved qualitative strategies for data collection was employed. A total number of 755 pupils, teachers, and head teachers were targeted for the study. A sample of 235 respondents including teachers, students, and headteachers, questionnaires, and interview schedules as the main research instruments. The findings and revealed that peer pressure influenced student dropout with 43.75%, family headship with 50%, parent financial status with 81.25%. Poverty was critical as it led to inadequate school supplies. The study therefore concluded that socio-economic factors highly influence the retention of students in secondary school. The above study provides some statistics on factors influencing the attendance rates of pupils, which is a major concern, that the present study needs to address.

Kipkemboi (2021), on factors influencing pupils' retention in public primary schools: A case of Trans Mara East sub-County– Narok County, Kenya. The study utilized an explanatory research design to target school heads, parents, pupils, board and committee members, and sub-county directors. The study revealed that economic factors, social-cultural factors and geographical proximity positively and significantly influence learner retention. As Kipkemboi focused on factors of pupil retention in public primary schools, the present study focused on various effects of jigger infestation that in turn affect the attendance rates in the study area.

Overall, the literature points to the multifaceted nature of low school attendance issues, influenced by socio-economic, environmental, and cultural factors. Addressing these challenges requires integrated approaches prioritizing equitable access to education, basic resources, and support systems for students and families. Efforts to improve attendance rates must consider local contexts and tailor interventions to meet the diverse needs of learners.

2.2 Extent of jigger infestation among students

Elson *et.al,* (2017) reviewed various kinds of literature on the control of jigger infestation in the absence of a roadmap worldwide, using Grassroots and global approaches. It was found that there is no effective and safe method to control the infestation, chemicals used to remove the flea are highly toxic to humans, Children, disabled persons, the mentally ill, and the elderly bear the highest disease burden. Children absent themselves from school because of discomfort, pain, and difficulties in walking to school. Elson *etal,* (2017), add that there is no universally accepted method for treatment in endemic communities and a roadmap for its control. Its prevalence is established to reach 60% in children and 30% in the general population. However, there might be nuances in how these factors affect secondary school students compared to primary school students. The current study delves deeper into understanding the specific challenges faced by secondary school students in Bumula Sub-County.

According to Tamene (2021), on the prevalence-associated factors of jigger infestation among 5- 14-year-olds in rural Ethiopia, a cross-sectional study using systematic random sampling was applied to select four

primary schools. Further, the study revealed that most children infested with jigger infestation were impaired and had lesions, hence causing difficulties in walking to school, they were also associated with poverty. The above study recommends that there is a need to improve housing conditions, community education on keeping animals separated from living spaces, and promotion of hygiene. While focusing on the prevalence and associated factors of Tungiasis among children living in Comparable environments, the study provides insights into the extent of the infestation on attendance and retention rates, to estimate the burdens of factors related to complications which is relevant to explore the extent of jigger infestation on students' attendance and retention rates.

Nakuya (2015) on factors influencing the occurrence of jigger infestation among pupils in Kivubuka primary school, Namulesa town Jinja District of Uganda, adopted a crossectional study and questionnaire methods administered to 368 pupils showed that the prevalence rate of jigger infestation was very high amongst pupils staying in rural areas. Especially those children staying in mud homesteads who never had shoes and those rearing pigs at home the infestation also affected pupils 'attendance at school as well as caused several abnormal changes in body the study recommended functioning recruitment of public health officers, increased awareness on the epidemiological situation, initiation of anti-jigger campaigns and treatment of domestic animals with insecticides. Based on the findings mentioned some gaps in the study include, dealing with poverty issues which increase jigger vulnerability and reduce pupils' school attendance which will form the basis for the current study.

Namuhani and Kiwanuka (2016), on persistence and associated factors among households in Mayuge District, Uganda. A total of 296 households were randomly selected to participate in the study. The study used semi-structured questionnaires, an observation checklist, and a key informant interview guide for data collection. The study found that there was a high prevalence of 58.3% of individuals who had persistent infestation and children from both primary and secondary schools absent themselves from school due to pain, itching, and deformities. The present study adopted one of the recommendations from the above study that, there is a need to increase awareness of community members on how to control jiggers to address the nature of houses that people live in.

Makena and Mwoma (2014), on jigger infestation as a menace to children's school attendance in Kiambu County, Gatundu District, Kenya. The study investigated the relationship between jigger infestation and participation at lower and upper primary schools. It utilized Ecological Systems theory and it employed descriptive survey design. The study sampled 44 jigger-infested children from all public primary school children. The study also applied questionnaires and observation schedules. The study later found out that jigger is a major threat to children's educational goals because they drop out of school, and recommends school managers to lairs with stakeholders to seek strategies for curbing infestation, carry out routine check-ups, and sensitize communities. The present study borrowed from the above study in the sense that, they both look at attendance rates and utilized ecological systems theory. However, the key difference is that the current study targets public day secondary school students in Bumula Sub-County.

Ochieng (2019), on the effects of jigger infestation on school enrolment and retention of children in South-East Alego Ward, Siaya County, applied a crossectional descriptive design and showed that jigger infestation was an issue of concern in public primary schools in Southeast Alego 92% of teachers attributing low school enrolment due to jigger infestation. He adds that of a total of 1065 school-going children who participated in the study, 279 (26%) were infested with jiggers, the majority 80% agreed that jigger infestation affected school attendance, while 96% agreed that it affected academic performance and pupils' retention. The current study also acknowledges the physical and psychological issues faced by students infested with jiggers which makes it difficult to attend school.

According to Juma *et al*, (2017), on the prevalence of tungiasis and its associated factors among primary school children in Karemo Division, Siaya County, Kenya, a descriptive statistics design was used. 432 pupils aged 5-14 years from class one to eight were randomly selected to participate in the study. The results indicated that 39.7% reported to have jigger infestation. On the social effects, children were teased, ridiculed, and stigmatized, thus contributing to school absenteeism. This study further recommended an integrated approach addressing the factors associated with jigger infestation to be implemented. Compared to the current study, it targeted public day secondary school students and used a mixed-methods research design. This study used simple random sampling to select students who participated in the study.

The literature collectively reinforces the severity of jigger infestation as a neglected tropical disease and its consequences on public health and children's education. The findings emphasize the need to combat the infestation which is persistent in the community with highly prevalent cases. Despite the valuable insights gained from these studies, there is still limited focus on the attendance and retention rates of students. This new study assesses the extent of jigger infestation on attendance and retention rates of students in public day secondary schools of Bumula Sub-County, Bungoma County, Kenya.

2.3Theoretical Review

2.3.1 Ecological Systems Theory

This theory was developed by Eurie Bronfebrina (1979). The theory is a framework for understanding the individual and the interaction with the environment. The interaction between factors in the individual's maturing biology, his immediate family/community environment, and the societal landscape fuels and steers their development. Changes or conflicts in any one layer will ripple throughout other layers. To study an individual's development then, it is important to look not only at the individual and their immediate environment but also at the interaction of the larger environment.

The main tenet of this theory is the individual's interaction with his immediate surroundings (social environment and physical environment) which enhances development, changes and occurrences within the environment will ripple throughout the other layers. Bronfenbrenner's theory defines complex "layers" of the environment, each affecting a child's development (Ryan 2001). These layers are microsystem, mesosystem, exosystem, and macrosystem.

The first and immediate setting or system in which the individual operates is known as the microsystem. This context includes the individual's family, school, peers, and neighbourhood. The most direct interactions take place in these contests with social agents like parents, siblings, peers, and teachers. The student depends on these social agents for care and support. Inadequate health care for example, by parents, siblings, guardians, or teachers, may lead to jiggers thriving in poor environmental conditions. Once the student is infested, they experience irritation and pain in the affected areas. If the pain is too much the student may fail to attend school.

Furthermore, failure to attend school due to ill health makes the child rage behind their peers in the attainment of concepts. This lowers their self-esteem and leads to poor involvement in school activities and hence poor academic performance. This poor performance causes much stigma to the child and may finally become a contributing factor for the child to drop out of school. On the other hand, if the social agents are supportive, they help in promoting healthy development of children which may help them to overcome jigger infestation and its adverse effects on their participation in school.

Its criticism is that it tends to be more descriptive than explanatory, offering less insight into the underlying mechanisms driving developmental processes. Despite these criticisms, Ecological Systems Theory remains a valuable framework, but researchers and practitioners should be mindful of its limitations and consider complementing it with other perspectives for a more comprehensive understanding of human development.

III. Research Methodology

The study was conducted in Bumula Sub-County, Bungoma County, Kenya and consists of Siboti, Bumula, Mukwa and Kimaeti wards. To examine the influence of jigger infestation on attendance and retention rates of students, this study used a mixed method design, which collected and analyzed quantitative data first followed by qualitative data to provide a more comprehensive understanding of the study. The target population of the study constituted of 10000 students, 15-20 years from all the 10 public day secondary schools in Bumula Sub-County. The study adopted Krejcie and Morgan's (1970) formulae to obtain the sample size as shown as shown below.

$$n = \frac{X^2 \times N \times P(1-P)}{(ME^2 \times (N-1)) + (X^2 \times P \times (1-P))}$$

n= sample size

X^2= Chi-square for specified confidence level at 1-degree freedom= (3.841) from tables

N= Population size

P= Population proportion (0.50) in the table.

ME= Desired margin of error (expressed as proportion =0.05)

$$n = \frac{3.841 \times 10000 \times 0.5 \times 0.5}{(0.05)^2 \times (10000-1) + 3.841 \times 0.5 \times 0.5}$$

n= 370 students

The researcher proportionally allocated the ten schools to calculate the sample that participated in the study. In each school, two categories of respondents participated in the study namely students and the head teacher as key informants. The researcher used simple random sampling (lottery method of marked and unmarked papers) to select students from each public day school that participated in the study. For the key informants, a sample size of 20 respondents was obtained, CHPs, local administrators and head teachers. Purposive sampling was applied for the key informants because they have adequate knowledge about jigger infestation in the study area.

Table 3.1 Sample Size

Population Category	Target Population	Sample Size
Khasoko secondary	1300	48
Myanga secondary	850	31
Maliki Mix Secondary	800	30
Lunao Secondary	1800	67
Mikokwe Secondary	1050	39
Chiliba Secondary	900	33
Namusasi Secondary	800	30
St Kizito Mayanja	850	31
Mateka Secondary	700	26
Bumula FYM secondary	950	35
Total	**10000**	**370**

The researcher developed questionnaires that were administered to students. The researcher further administered interview guides, which comprised open-ended questions directed at getting in-depth understanding of the topic of interest, from the Key informants. It was administered to selected teachers, CHWs/ CHPs, and the local administrators and parents who were purposively sampled as the main key informants for the study. The researcher requested an introductory letter from the Board of Postgraduate Studies of Maasai Mara University and also made an application to the National Commission of Science, Technology and Innovation (NACOSTI) for the research permit. Quantitative data was analyzed using descriptive statistics, including the calculation of frequencies, measures of central tendencies like means, and measures of variability like standard deviations for continuous data. Categorical were presented as percentages. The study utilized SPSS version 27 to perform the calculation, leveraging an adopted Likert scale for data interpretation. Qualitative data was analyzed thematically.

IV. Data Analysis and Presentation

4.1 Findings of the Study

4.1.1 Response rate

The researcher distributed a total of 370 questionnaires and 310 questionnaires were returned and used for the analysis process. The study established that this represents % of the total number of questionnaires distributed. The results are presented in Table 4.1 below.

Table 4.1: Response Rate

Response	Distributed	Returned	Non-response
Number of questionnaires	370	310	60
Percentage %	**100%**	**83.8%**	**16.2%**

The table above shows an 83.8% response rate, which was considered appropriate for data analysis. According to Merton (2006), a response rate of 70% and above is considered appropriate for a descriptive survey. In line with the above, the study concluded that the questionnaires were enough for data analysis. The non-response rate accommodated questionnaires that were poorly answered and zero responses. This accounted for a 16.2% non-response rate of the total number of questionnaires.

4.2 Analysis of Demographic Data

For descriptive studies, demographic data is paramount because such data has an influence response and overall results of a given study. In other words, demographics form a basis within which the responses of the target population are analyzed and evaluated to deduce their opinion on a given subject. For this study, gender, age, class (Form), level of education of parents, parent's occupation, and whether the students lived with their

relatives were the demographic variables that were considered for this study. The results are presented in the sub-sections below.

4.2.1 Gender of Respondents

The first demographic variable that was analyzed was gender. The results are presented in Figure 4.1 below.

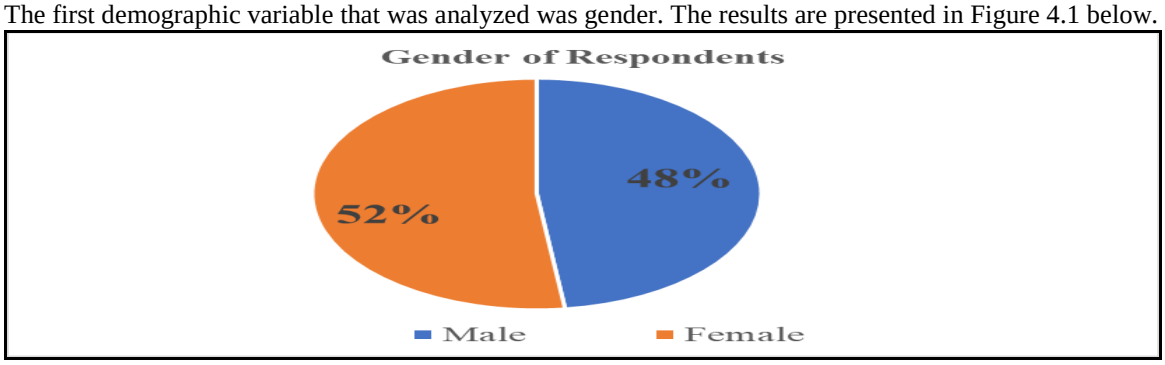

Figure 4.1: Gender of the Respondents

Regarding the gender of respondents, the researcher established that 52% of the respondents were female while 48% of respondents were male. This indicates that there were slightly more female students than male students who participated in the study. This depicts that the response between male and female students on the above subject was nearly equal. This further shows that both male and female students were affected by jiggers in equal measures in the study area.

4.3.2 Age of Respondents

Secondly, the study sought to determine the age of respondents in the study area. The study results are presented in Figure 4.2 below.

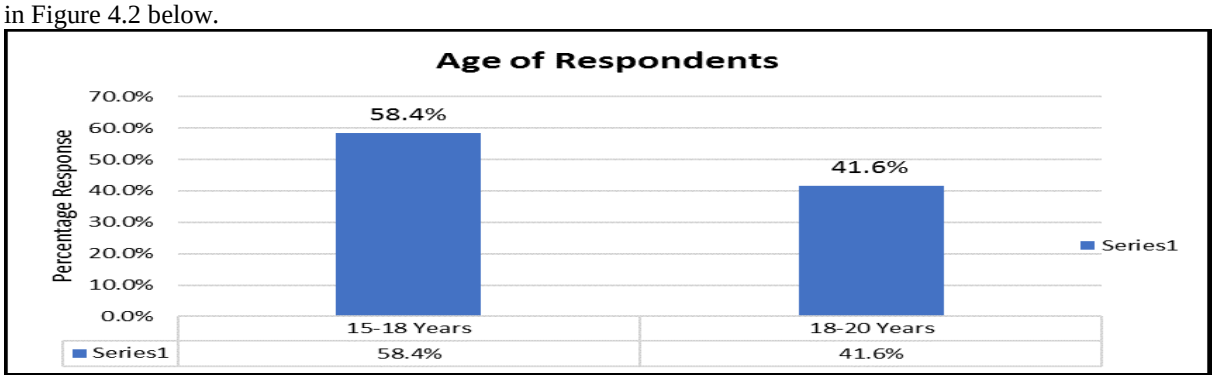

Figure 4.2: Age of Respondents

The study sought to establish the age of the respondents who took part in the study. Results revealed that 58.4% of the respondents were between ages 15 and 18 while those who were above 18 years was 41.6%. This indicates that all the students who participated in the study were old enough to understand how the infestation has influenced students' retention in the study area.

4.3.3 Level of Education

Thirdly, the study further sought to determine the class that respondents had been drawn. All the schools sampled had classes beginning from form one to form four. This was important because it shaped the opinions of respondents of the above research. The study revealed that the percentage of students who took part in the study in both form four and form three was 31% respectively. The study further established that 24.5% and 13.5% of the respondents were from form two and form one classes respectively. These showed that the majority of the students who took part in the study were from the upper classes in secondary schools. The results are presented in Table 4.2 below.

Table 4.2: Level of Education of Respondents

Class/Form	Frequency	Percentage
Form 1	41	13.5
Form 2	76	24.5
Form 3	96	31.0
Form 4	96	31.0
Total	**310**	**100**

4.3.4 Number of Siblings of Respondents

Also, the study sought to establish the number of siblings that the respondents had from home. The study results are presented in Figure 4.3 below.

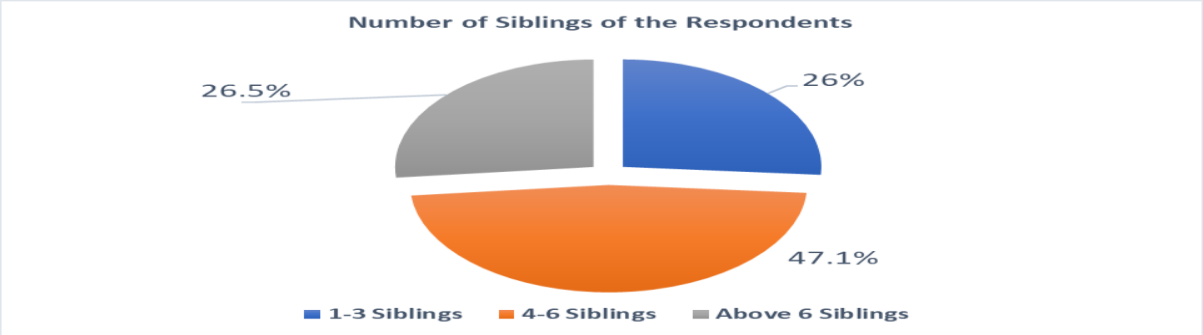

Figure 4.3: Number of siblings

The study also sought to analyze the number of siblings that each had back from their families. It was established that 47.1% of respondents had between four and six siblings, 26.5% had above six siblings and 26.1% of the respondents had between one and three siblings. This indicates that the majority of the respondents came from families that had many siblings and hence this could have an influence on how families were able to handle issues related to jigger infestation.

4.3.5 Level of Education of Mother

The study sought to determine the respondent's parents' educational levels. The study revealed that the mother's educational levels were analyzed and presented in Figure 4.4 below

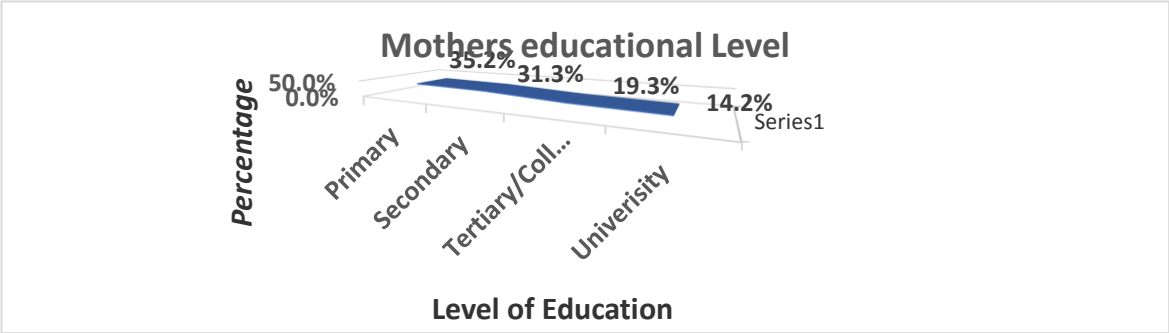

Figure 4.4: Mothers educational levels

The study also sought to establish the extent to which parents' level of education had an influence on the topic under study. The study sought to examine the influence of the mother's educational level and how it influenced jigger infestation in the study area. The study established that 35.2% of respondents had only attained primary education while 31.3% of respondents had attained high school education. 19.3% of respondents had attained a college education while 14.2% of respondents had attained a university education. This indicates that the majority of mothers in the study area had attained basic education which was not enough to propel them to opportunities related to employment that could have affected their living standards appropriately. Education should enable women to access information related to sanitation and hygiene which was not the case for many mothers in Bungoma County.

4.3.6 Fathers educational level

Table 4.3: Fathers educational level

Level of Education	Frequency	Percentages
Primary School	91	29.4
Secondary School	92	29.7
Tertiary	60	19.4
University	67	21.6
Total	**310**	**100**

Fathers' educational levels were computed as shown in table 4.3 as shown above. The study established that 29.7% of men had attained secondary education while 29.4% had attained primary education. The study further established that 21.6% of the respondents had attained University education. It was further established that 19.4% of the respondents had attained tertiary level. This indicates that the majority of the respondent's parents had low educational levels which were the reason why they were poor. In line with the above, high poverty levels have made families have challenges in combating the jigger infestation menace.

4.3.7 Mother's Occupation

The study further sought to establish the extent to which parents' occupations influenced combating jiggers at the household level. The study established that 46.2% of the respondents' mothers were unemployed while 31.9% of respondents' mothers were self-employed. The study further revealed that 21.9% of mother's respondents were employed. When respondents were further questioned about their mothers' occupation, they revealed that even those who were self-employed still could not meet much of the basic needs at the household level. This still influenced the extent to which they were going to deal with the jigger infestation menace. The results are presented in Table 4.4 below.

Table 4.4: Mothers occupation

Mothers' occupation	Frequency	Percentage
Employed	68	21.9
Unemployed	143	46.2
Self-employed	99	31.9
Total	**310**	**100**

4.3.8 Father's Occupation

Further analysis of the father's occupation is presented in Figure 4.5 as shown below. The study results revealed that 50.3% of the respondents' fathers were unemployed. The study further established that 26.8% of the respondents' parents were employed while 22.6% of the respondents' fathers were self-employed. This indicates that the majority of the respondents are unemployed and hence could not meet basic household needs. This further propagated the households into more poverty and hence their inability to deal with the jiggers' menace.

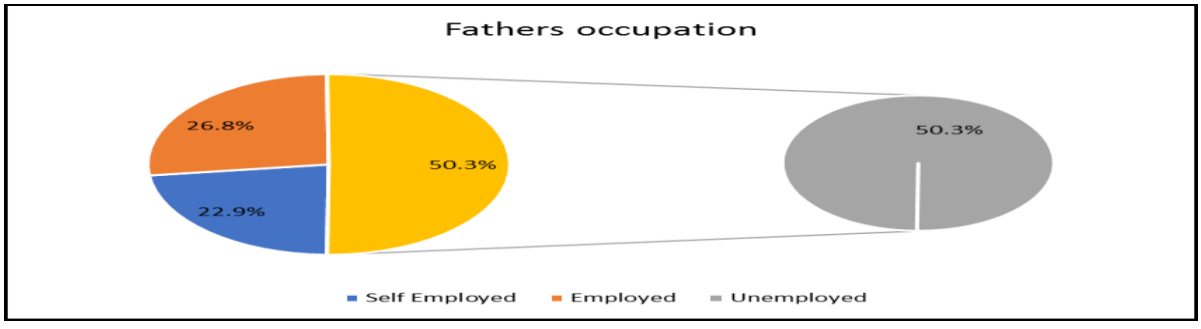

Figure 4.5: Father's occupation

4.3.9 Place of Residence

Lastly, the study sought to analyze whether respondents were living at home with parents or guardians and other relatives. The study results are presented in Figure 5.6 below. The study results revealed that 67.7% of the respondents were living with their relatives and guardians while 32.3% of respondents lived at home with their parents. Most of the respondents believed that living with their guardians and relatives was very difficult as it made them more susceptible to the vulnerabilities of jigger infestation. The study revealed that people who lived with their relatives and guardians were more susceptible to social issues like jigger infestation which made them drop out of school.

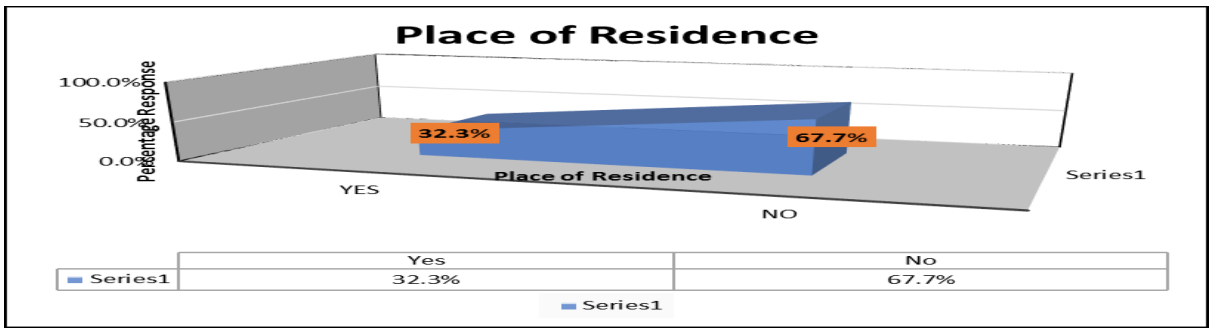

Figure 5.6: Place of Residence by respondents

4.4 Analysis of the Descriptive Statistics

4.4.1 Extent of jigger infestation on attendance rates among students

This objective sought to determine the extent of jigger infestation on attendance and retention rates of students in public day secondary schools in Bumula Sub-County, Bungoma County, Kenya. The respondents were required to give their opinion by indicating the extent to which they agreed or disagreed with the various statements as presented in Table 4.5. The results of the study were analyzed descriptively using percentages, mean, and standard deviation. The results are presented as shown below. On a scale of **5= Strongly Agree; 4 = Agree; 3 = Not Sure; 2= Disagree; 1 = strongly Disagree,** the respondents were required to give their opinion on the statements provided **in Table 4.5**

Table 4.5: Extent of jigger infestation on attendance and retention rates of students

Statements	SA	A	NS	D	SD	M	S. D
Students become absent from school due to jigger infestation.	44.8%	43.5%	4.8%	4.5%	2.3%	4.45	0.967
Students infested with jiggers miss school more than non-affected.	37.7%	45.8%	10%	4.8%	1.6%	4.47	1.004
Jigger infestation affects school attendance and retention rates.	34.5%	38.4%	21.9%	4.2%	0.6%	3.89	1.343
There are cases of jigger infestation among students in your school.	39%	49%	4.8%	4.2%	2.9%	4.65	0.976
Jigger infestation contributes to chronic absenteeism among students in your school.	40.3%	44.2%	7.4%	3.9%	4.2%	4.58	0.897

The study sought to determine whether students were absent from school due to jigger infestation in Bumula sub-County, Bungoma County, Kenya. The study results revealed that 44.8% strongly agreed while 43.5% agreed with the statement above. Further analysis revealed that 4.8% were not sure, while 4.5% disagreed with the statement above. It was also established that only 2.3% strongly disagreed with the statement above. This indicates that the majority of the respondents believed that students miss school due to jigger infestation in Bumula sub-County, Bungoma County, Kenya.

The study examines whether students jiggers infested with jiggers, missed school more than non-affected 37.7% of the respondents strongly agree while 45.8% agree with the statement above. Further analysis revealed that 10 % were not sure as to whether students miss school more than non-affected. However, further

analysis revealed that 4.8% of the respondents disagreed while 1.6% of students missed school more than non-affected of the respondents strongly disagreed that students. This suggests that the majority of the respondents believe that jigger infestation in the Bumula sub-county contributes to students' absenteeism rates.

The study further sought to examine whether jigger infestation affects school attendance rates in Bumula sub-county, Bungoma County, Kenya. The study results established that 34.5% of the respondents strongly agreed, while 38.4% agreed with the statement that jigger infestation affects school attendance rates in Bumula sub-county, Bungoma County, Kenya. Further analysis revealed that 21.9% of the respondents were not sure to whether jigger infestation affects school attendance and retention rates in Bumula sub-county, Bungoma County, Kenya. Also, it was established that 4.2% of the respondents disagreed while 0.6% of the respondents strongly disagreed with the statement that jigger infestation affects school attendance in Bumula sub-County, Bungoma County, Kenya. This shows, that the majority of respondents believed that jigger infestation has an impact on attendance rates in Bumula sub-county, Bungoma County, Kenya.

When asked to give their opinion about the existence of cases of jigger infestation among students in schools in Bumula sub-County, Bungoma County, Kenya, 39 % of the respondents strongly agreed while 49% of the respondents agreed with the statement above. The study further established that 4.8% of the respondents were not sure as to whether there existed cases of jigger infestation among students in schools in Bumula sub-County, Bungoma County, Kenya while 4.2% and 2.9% of the respondents disagreed of the respondents strongly disagreed respectively. This indicates that a majority of respondents acknowledge the presence of jigger infestation among students in schools in Bumula sub-county, Bungoma County, Kenya.

Lastly, on whether jigger infestation contributes to chronic absenteeism among students in the study area, the study established that 40.3% of the respondents strongly agreed while 44.2% of the respondents agreed with the statement above. Further analysis revealed that 7.4% of the respondents were not sure as to whether jigger infestation contributes to chronic absenteeism among students in Bumula sub-county, Bungoma County, Kenya. The study results further revealed that 3.9% of respondents disagreed while 4.2% of the respondents strongly disagreed that jigger infestation contributes chronic absenteeism among students in the Bumula sub-county. This suggests that a significant proportion of respondents believed that jigger infestation plays a role in student chronic absenteeism rates in many schools in the Bumula sub-county.

4.4.4 Attendance and retention rates of students in Bumula Sub-County.

The respondents were also required to rate the various indicators of attendance and retention rates of students in Bumula Sub- County which formed the dependent variable. The results were analyzed descriptively using percentages, means, and standard deviations to make deductions on how the respondents analyzed the various statement items describing the extent to which schools in Bumula Sub-County dealt with jigger infestation and how it affected attendance and retention rates of students. The results are presented in Table 4.8 as shown below.

Table 4.6: Attendance and retention rates of students in Bumula Sub-County.

Statements	SA	A	NS	D	SD	M	S. D
Jigger infestation has a direct impact on the completion rates of students in public day secondary schools who are infested in Bumula Sub-County.	35.8%	39.0%	17.1%	7.1%	1.0%	4.15	0.875
Students affected by jiggers are more likely to be absent from school.	24.2%	56.5%	13.9%	4.2%	1.3%	3.85	1.005
Students affected by jiggers tend to miss more classes compared to those who are not affected.	31.3%	44.2%	12.3%	9.0%	3.2%	3.95	0.995
Jigger infestation negatively affects students' attendance and retention in schools in Bumula sub-County, Kenya.	28.1%	54.8%	10.3%	4.2%	2.6%	3.75	1.225
Implementing measures to eradicate jiggers can lead to can lead to students' retention rates	55.0%	36.6%	3.9%	1.6%	2.9%	4.08	0.925
Jigger infestation awareness and prevention programs can help improve students' attendance rates in public day secondary schools of Bumula Sub- County.	55.2%	37.7%	2.9%	2.9%	1.3%	4.17	0.905

The study sought to examine whether jigger infestation has a direct impact on the completion rates of students in public day secondary schools who are infested in Bumula Sub-County. The study results revealed that 39% and 35.8% agreed and strongly agreed with the statement above. The study further revealed that 17.1 % of respondents were not sure of the statement above. The study results further indicate that 7.1% and 1% disagreed and disagreed respectively that jigger infestation had a direct impact on completion rates of students in public day secondary schools who are infested in Bumula Sub-County. From the above results, the study results generally established that it was due to jigger infestation that attendance and retention rates of students had plummeted in the study area. This had led to massive dropout rates which impacted the overall student enrolment and retention in the study area.

The study sought to establish whether students affected by jiggers are more likely to be absent from school. The study results revealed that 56.5% agreed while 24.2% of the respondents agreed and strongly agreed with the statement above. Further analysis revealed that 13.9% of the respondents were not sure whether students affected by jiggers are more likely to be absent from school. It was also established that 4.2% and 1.3% of respondents agreed and disagreed respectively that students affected by jigger are more likely to be absent from school. This indicates that students who are affected by jiggers are more likely to be absent from school based on the results above and this affected enrolment and retention rates generally.

On whether students affected by jiggers tend to miss more classes compared to those who are not affected, the study results revealed that 44.2% agreed and 31.3% strongly agreed with the statement above. The study also further revealed that 12.3% were not sure as to whether students affected by jiggers tend to miss more classes compared to those who are not affected. Further analysis established that 9% and 3.2% agreed and strongly agreed that students affected by jiggers tend to miss more classes compared to those who are not affected. The study generally established that the majority of the respondents believed that indeed students affected by jiggers were more likely to miss classes compared to those who are not affected based on the above study findings. This impacted on the attendance and retention of students in schools in the study area.

The study results also found that 54.8% and 28.1% of the respondents agreed and strongly agreed respectively that jigger infestation negatively affects students' attendance and retention in schools in Bumula sub-County, Kenya. The study results further revealed that 10.3% of the respondents were not sure whether jigger infestation negatively affected students' attendance and retention in schools in Bumula sub-County, Kenya. The study further revealed that 4.2% and 2.6% of respondents noted that Jigger infestation negatively affected students' attendance and retention in schools in Bumula sub-County, Kenya. The study concluded that the above results indicate that jigger infestation had a negative impact on promoting quality education in the study area.

The study results further established that 55% and 36.6% of the respondents agreed and strongly agreed with the statement that implementing measures to eradicate jiggers can lead to student retention rates in the study area. It was further established that 3.9% of the respondents were not sure whether implementing measures to eradicate jiggers could lead to student retention rates in the study area. The study results also established that 2.9% and 1.6% of the respondents agreed and strongly agreed respectively that implementing measures to eradicate jiggers can lead to students' retention rates. From the above study results, it was established that if proper measures to eradicate jigger infestation in the study area are put into practice, then attendance and retention of students in schools are likely to be improved.

On whether jigger infestation awareness and prevention programs can help improve students' attendance rates in public day secondary schools of Bumula Sub-County, the study results revealed that 55.7% and 37.7% of respondents strongly agreed and agreed with the statement above. The study results further revealed that 2.9% of the respondents were not sure whether jigger infestation awareness and prevention programs could help improve students' attendance rates in public day secondary schools of Bumula Sub-County, Kenya. This is a clear indication that the majority of the respondents believed that jigger infestation awareness and prevention programs can help improve students' attendance rates in public day secondary schools of Bumula Sub-County if well implemented.

4.4.5 Correlation Analysis

The study sought to establish the nature of the relationship between extent of jigger infestation and attendance rates of students in public day secondary schools of Bumula Sub-County. This was tested using correlation coefficients as suggested by Cohen, West and Aiken, (2003). The study used Pearson correlation (r) to test whether the relationship between the variables was significant or not at 95% level of confidence. The relationship between the two variables was considered significant if the p value was less than 0.05. It was considered to be weak if the correlation (r) < 0.5 and it was considered to be strong if the correlation (r) was > 0.5. The results are presented in Table 4.15.

Table 4.7 Correlation Analysis

		Attendance Rates
Extent of Jigger Infestation	Pearson Correlation	.459**
	Sig(2-tailed)	.000
	N	307

****. Correlation is significant at the 0.005 level (2-tailed).**

The result show that there is a weak but strong significant correlation between extent of jigger infestation on students and attendance rates of students in public day secondary schools of Bumula Sub-County, indicated by the study results (r = .459** and a p-value of .000). This implies that though extent of jigger infestation has a very significant influence on attendance rates of students in public day secondary schools of Bumula Sub-County, but the influence is very weak. This means that some students could be infested by jiggers but they still manage to attend school and do well in their studies

4.5 Thematic Analysis of the Interviewee Responses.

The respondents were required to give their opinions about the questions at hand. This section presented data from key informant interviews by analyzing the data thematically to generate a sound interpretation of the data. The following themes were established from the data collected from key informants. The key informants for the study in Bumula Sub-County included 10 Head Teachers, 5 community Health Volunteers, and 5 Area Chiefs. These officials were coded as **HT** for Head teachers (HT001A to HT010A) **CHPs** (CHP001B to CHW005B) for Community Health Workers and **CHF** for Chiefs (CHF001D to CHF005D). In total, the key informants were 20. The following themes were generated from the data collected from key informants in Bumula Sub-County, Kenya. The analysis of their responses is shown below.

4.5.1 Extent of jigger infestation on student's attendance and retention

The first objective of the study sought to examine the extent to which jigger infestation influences attendance and retention in Bumula Sub-County, Kenya. The study results established that all the key informants were in agreement that jigger infestation has had an impact on student enrolment in schools. This is because healthy children will have an advantage in school enrolment over unhealthy children.

4.5.1 Jigger infestation and Student enrolment

While many children get enrolled in schools in Kenya, it is established that those children from jigger-prone areas always get disadvantaged because of the challenges of jigger infestation. The study results from some of the key informants (CHF001D to CHF005D) established that jigger infestation affects school enrolment because children may be unable to walk, write properly, participate in school co-curricular activities, and mingle with their peers. All these factors compounded together influence the extent to which children are enrolled in schools. This in return has a dent on how quality education is achieved in the areas prone to jigger infestation.

According to HT001A to HT010A, school heads from the sampled schools, jigger infestation affects the most vulnerable parts of students' bodies specifically the feet and hands. The respondent verbatim was analyzed and recorded and they noted that;

'It makes it hard for a student to move from one place to another or with a lot of difficulties. When school is a bit distant from the home it becomes very hard for students to walk to school, especially in public day secondary schools of Bumula. There are frequently reported cases of jigger infestation in students in public day secondary schools. Students fail to attend school because of lack of concentration due to itching and uncomfortableness. Additionally, students fear being laughed at by their peers who may not be affected or infected.'

The above verbatim was complemented by CHW001B to CHW005B who are area community health workers/promoters who agreed that jigger infestation was a very big menace when it comes to student enrolment in schools. This has led to low enrolment in nearly all the schools in the study area.

4.5.2 Jigger infestation and student attendance

One of the themes that also emanated from the above study was student attendance in schools. It was established by all the 20 key informants that attendance of students in many schools in Bumula Sub-County, had been affected by jigger infestation. For instance, all the community health promoters (CHP001B to CHP005B) established that jigger infestation varies depending on the region where students come from within the sub-county. Their verbatim was recorded as follows;

Some cases of jigger infestation are so prevalent and others are low. There were frequently reported cases of jigger infestation among students who stopped coming to school to go for check-ups. Beyond physical pain, they fear coming to school to associate with others because they will be ridiculed and stigmatized.

All the head teachers from all the schools that were sampled (HT001A to HT010A) also noted that jigger infestation has a significant impact on the attendance rates of the secondary school students of Bumula Sub-County. Mostly after students are infested the itching and inflammation caused by jiggers contribute to difficulties in concentrating both in class or participating in any school activity. This lowers school attendance and in the long run school dropout rates increase. The infestation also leads to secondary infections like tetanus that may be severe. Students infested with jiggers cannot be retained in schools because of fear of being ridiculed, nicknamed, or laughed at and also this may cause them to drop out of school.

4.5.3 Jigger Infestation, School absenteeism, and dropout rates

The study further established from all the key informants that school absenteeism and dropout rates were on the rise in the study area due to jigger infestation. According to area local administrators (CHF001D to CHF005D) jigger infestation has a very bad effect on students and community well-being across Bungoma County. The above respondents noted that;

'The extent of jigger infestation is very high not only to students but also to the community generally especially in the Bumula sub-county. When a student is infested with jiggers it forces them to drop out of school for almost three months to go for treatment and even others fear being ridiculed this will force the student to repeat the same class because others would have graduated to the next level. Other students fail to attend school for some days. It causes discomfort in class thus low concentration because of itching. Jiggers highly contribute to school dropouts and absenteeism.'

The above sentiments were further supported by sentiments from head teachers like HT001A, HT003A, and HT004A who noted that students who have jiggers fail to attend class, others drop out of school because some people laugh at them, and others go for treatment or stay at home for more than three months. When they later resume school most of them fail to transition to the next class so that they can cover the previous syllabus. This has affected students within the area as many of them choose to drop out of school permanently. In many schools in the larger Bungoma County, absenteeism and dropout rates are higher.

4.5.4 Jigger Infestation and Poverty

Poverty is one of the biggest factors that has hampered school enrolment, retention, and dropout rates. Poverty makes students not to afford decent shoes while some who have the shoes are in dilapidated conditions. The attendance rates of students are very poor as most of them come from very far and they walk about 5 to 10 kilometres to reach School. According to local administrators (CHF001D to CHF005D) attendance rates of students are nearly 50% or even less due to jigger infestation and this means that absenteeism and dropout rates are very high in this region. The frequency of jigger infestation is very high weekly and this disrupts normal learning across Bungoma County generally.

All Community health promoters (CHP001B TO CHP005B) further noted that the extent of jigger infestation in public day secondary schools of the Bumula sub-county is extreme. The respondent noted that they usually receive cases of jigger infestation from students every week. Other cases happen at extreme to an extent when students cannot be able to walk to school or wear shoes thus causing school dropouts and absenteeism. Students with jiggers are not comfortable because jiggers cause itching on their legs and hands. The head teachers from the study area (HT001A to HT010A) had their verbatim recorded as follows;

"We have handled various cases when we follow up in the community or homes where students come from. These students come from very poor backgrounds with very dirty environments. They do not have toilets in their compounds and they mostly lack proper hygiene and sanitation which causes jiggers to thrive. Living in mud houses further makes the jigger menace more complicated. Most of the areas in Bumula have red soil types which support jiggers to thrive".

The same sentiments were echoed by respondents CHF001C to CHF003C. The key informants noted that despite efforts by a few NGOs who are out to end the menace by creating awareness and educating the masses by ensuring everyone has a basic education, it is not enough if the levels of poverty are still high, especially in Bumula sub- County. The respondents agreed that lack of appropriate basic needs such as proper housing structures, footwear, clean clothing, and sharing houses with domestic animals as a result of poverty, not only speeds up the scourge but contributes to the vicious cycle of poverty in the study area. R010 had this to say about the jigger menace in the study area;

'In many parts of Bungoma County, including Bumula Sub-County, low domestic income levels for many inhabitants translate to high poverty levels. Across the sub-county, most schools harbour people from these

backgrounds and hence these poor resource set-ups aggravate the plague. Most of those affected do not have strong economic backgrounds which indicates that they are not able to meet their basic needs leading to aggravated poverty in the study area. This then will cause an increase in absenteeism of students and dropouts, hence affecting their attendance and retention rates.'

4.6 Discussion of Research Findings

4.6.1 Extent of jigger infestation on student's attendance and retention in Bumula sub-County

The objective of the study sought to determine the extent of jigger infestation on attendance and retention rates of students in public day secondary schools in Bumula Sub-County, Bungoma County, Kenya. The study results revealed that the majority of the respondents 44.8% noted that children do not go to school because of jigger infestation. It was also established that students drop out of school because they are stigmatized and feel rejected and side lined by their fellow students and to some extent by their teachers.

It is due to this that they felt victimized and hence avoided going to school as a result of the same. The study further established that the majority of those who dropped out of school were from poor backgrounds, they could not afford proper treatment when infected with jiggers. The study further revealed that generally, jigger infestation had a negative impact on student enrolment and retention in schools as the majority of those who were infected could not continue attending schools because of the challenge. The above results were in agreement with Tamenes' study of 2021 which established that most children infested with jigger infestation were impaired and had lesions, hence causing difficulties in walking to school which was associated with poverty. The study recommends there is a need to improve housing conditions, community education on keeping animals separated from living spaces, and promotion of hygiene.

Data from key informants revealed that jigger infestation had a significant impact on the attendance and retention rates of the secondary school students of Bumula sub- County. It was established that when they are infested with jiggers, the itching and inflammation caused by jiggers contribute to difficulties in concentrating both in class or participating in any school-related activities like games and sports this lowers school attendance and also retention rates due to victimization and stigma that these students undergo. The infestation also leads to secondary infections like tetanus that may be severe. Students infested with jiggers always absent themselves from school because of fear of being ridiculed named or laughed at and also this may cause them to drop out of school.

The respondents also established that there are cases of jigger infestation among students in their school at a very high rate and persistent, which lowers the attendance and retention rates of students in the study area, especially for those. This was supported by Namuhani and Kiwanuka (2016), who noted that children from both primary and secondary schools were absent from school due to persistent infestation of jiggers.Respondents further noted that despite efforts by NGOs like the Kenya Red Cross and those who were out to end the menace by creating awareness and educating the masses by ensuring that everyone had a basic education, results revealed this was not enough if the levels of poverty are still high in the study area.

Results further established that lack of appropriate basic needs such as proper housing structures, footwear, clean clothing, and sharing houses with domestic animals, not only sped up the scourge of jigger infestation but also contributed to the vicious cycle of poverty in the study area. It was further noted that should this continue, it was becoming worse every day. The above results were in agreement with the study of Elson *et.al,* (2017) who noted that children drop out of school because of discomfort, pain, and difficulties in walking to school.

Generally, the study revealed that walking bare feet, the low educational level of parents, poor personal hygiene, and poor sanitation of the houses were the main reasons as to why many school-going students were infested with jiggers. This in turn led to low school attendance and retention rates hence affecting literacy levels in the study area. This is supported by Ochieng (2019), study which says that jigger infestation affects school enrolment and retention rates.

Linking the above studies to ecological systems theory, the is a need to understand issues through multiple interconnectedness of systems of students' environments like the characteristics of the immediate environment (microsystem) like parental education level influences personal hygiene practices. The exosystem involves external factors like community sanitation and the macro system includes broader cultural and societal influences. Jigger infestation affects both micro and macro systems within students' environment and it disrupts their attendance and retention rates in school.

Lastly, correlation revealed that there is a weak but strong significant correlation between extent of jigger infestation on students and attendance rates in public day secondary schools of Bumula Sub-County, indicated by the study results ($r = .459^{**}$ and a p-value=.000). This implies that though extent of jigger infestation has a very significant influence on attendance rates of students in public day secondary schools of Bumula Sub-County, but the influence is very weak. This means that some students could be infested by jiggers but they still manage to attend school and do well in their studies. This means that jigger infestation and a combination of other factors could deter students from attending school regularly.

V. Summary, Conclusions and Recommendations

5.1 Summary of Findings

5.1.1 Demographic variables

The study registered a response rate of 86.6% which was adequate for the study. According to Merton (2006), a response rate of 70% and above is enough in a descriptive survey. The study registered an equal number of respondents in terms of male and female students who participated in the study. This indicates that the disparities that existed before in male and female enrollments may been minimized in academic institutions. Majority of the respondents who participated in the study were above the age of 16 years, a clear indication they were old enough to explain the implications of jigger infestation in the study area on students. The study also revealed that the respondents came from families of more than four siblings which indicated that many households in the study area are moderately large. It was further established that most parents had low education levels which translated to poverty and vulnerability in the study area. The study further revealed that the majority of caregivers were unemployed a justification for the high poverty levels in the study area.

5.1.2 Extent of jigger infestation on student attendance in Bumula sub-county.

The objective of the study sought to determine the extent of jigger infestation on students' attendance rates in public day secondary schools in Bumula sub-county, Bungoma County, Kenya. The study results revealed that jigger infestation had adversely affected students' attendance rates in the study area. It was further established that students dropped out of school because they felt stigmatized and sidelined by their fellow students and to some extent by their teachers. This led to depression and hopelessness amongst students which led to low attendance of many students in day schools in the study area.

The study further established that jigger infestation had a significant impact on the attendance rates of students in day secondary schools in Bumula sub- County. The study results revealed that mostly after students are infested, the itching and inflammation caused by jiggers contribute to the difficulties of coming to school because the majority of them walk to school. Secondly, jigger infestation also made it difficult for students to concentrate both in class, or participate in any school activities which lowered school attendance rates.

The infestation also led to secondary infections like tetanus which in turn out to be severe. Students infested with jiggers were always absent from school because of fear of being ridiculed or laughed at and this caused them to drop out of school. In summary, jigger infestation had adversely affected student enrolment, and attendance in many public day schools in the study area and this had an impact on education in the study area. Generally, the study revealed that walking barefeet, the low educational level of parents, poor personal hygiene, and poor sanitation of the houses were the main reasons as to why many school-going children were infested with jiggers. This in turn led to low school attendance rates among school-going children hence affecting literacy levels in the study area.

5.3 Conclusions

The study concludes that jigger infestation had adversely affected the attendance and retention of students in the study area. Generally, the study also concludes that the itching and inflammation caused by jiggers contributed to the difficulties that were experienced by students while reporting to schools in the study area because the majority of them walked to school. Also, the study concludes that jigger infestation has adversely affected the concentration of students both in class and participation in school activities which has lowered school attendance and retention rates. The study further concludes that students infested with jiggers failed to attend school because of social stigma and discrimination by their peers and, to some extent their teachers. This tortured them emotionally and they decided just to stay at home for treatment so that they cannot be ridiculed.

5.4 Recommendations for the Study

Based on the findings of this study, the following recommendations are drawn.

i. Schools should establish health clinics and also conduct regular checkups to identify and address the issue. There is also a need to collaborate with stakeholders like parents, government, and NGOs to tackle the problem of jigger infestation and how it has adversely affected the attendance and retention rates in a multi-stakeholder approach.

ii. To address the issue of poverty, there is a need to Collaborate with government agencies and non-governmental organizations (NGOs) to allocate resources and support initiatives aimed at combating jigger infestation in schools and homes

iii. There is also a need for schools to collaborate with communities to address the issue of maintaining clean surroundings and also engage parents and community leaders in health campaigns to ensure a holistic approach to preventing jigger infestation.

iv. Teachers need further training on new methods of dealing with jigger infestation in schools in the study area.

v. Teachers should ensure they accommodate those affected by jigger infestation to minimize absenteeism and hence prevent stigmatization amongst the affected students.

5.5 Areas for Further Study

Following the above recommendations, the study proposes the following areas for further studies and research;

i. Since there were difficulties in integrating both quantitative and qualitative data analysis synthesizing the findings and drawing meaningful conclusions. There is a need to conduct a study specifically focusing on the effectiveness of different triangulation techniques in enhancing the validity and reliability of research findings. This could involve comparing various methods of data triangulation and their impact on drawing meaningful conclusions.

ii. Conduct a study on the potential biases introduced by different sampling techniques. Explore the impact of purposive sampling compared to other sampling methods, such as random sampling, on the representation of diverse perspectives in research. To avoid sampling techniques bias.

iii. Investigate strategies for overcoming geographical challenges in research, especially in areas with scattered populations due to terrain. This could include exploring technology-assisted data collection methods or developing innovative ways to address logistical challenges. This is to be done to avoid geographical challenges in research.

iv. There is a need to Investigate different validation techniques used in research to reduce bias and enhance the credibility of study findings. Compare and contrast the effectiveness of various validation methods in different research contexts.

v. Conduct longitudinal studies to track the impact of interventions over an extended period, providing insights into the sustainability and long-term effectiveness of measures taken to address jigger infestation in schools.

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