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The Role of Public Health Communication in Raising Tungiasis Awareness in Vihiga County, Kenya

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Abstract

Tungiasis, a parasitic skin disease caused by *Tunga penetrans*, remains a neglected public health challenge in rural Kenya. Vihiga County has been identified as a hyper-endemic region, recording one of the highest prevalence rates in the country, a situation driven by poor sanitation, low literacy levels and persistent poverty Despite ongoing control programs, Effective control and eventual eradication of tungiasis are fundamentally dependent upon successful Public Health Communication (PHC) campaigns designed to raise awareness, dismantle myths and promote sustainable behavioral changes, there is limited evidence on how existing strategies influence awareness and behavior change locally. This study addresses that gap by assessing the role of public health communication in raising tungiasis awareness in Vihiga County, Kenya, aiming to provide locally grounded insights for designing more effective and culturally responsive communication interventions to reduce tungiasis prevalence in endemic regions. Communication theory developed by Claude Shannon and Warren Weaver in 1949 guided the study. The study adopted a cross-sectional mixed-methods design guided by the interpretive paradigm. Quantitative data were collected from 400 purposively selected household members from Vihiga and Sabatia sub-counties using structured questionnaires. Qualitative data were gathered through eight Key Informant Interviews (KIIs) with health workers and eight Focus Group Discussions (FGDs) with community members and Community Health Workers (CHWs). Quantitative data were analyzed using descriptive and inferential statistics in Stata 17. Qualitative data were transcribed, coded and analyzed thematically using NVivo 12.4. The study adhered to strict ethical standards during data collection. Findings showed that of majority of the respondents (82.3%) were aware of tungiasis primarily sourced from community awareness initiatives and media. Chi-square results indicated significant associations between gender and awareness of tungiasis ($\chi^2 = 4.02$, df = 1, p = 0.045), education and knowledge of the

cause (χ^2 = 14.87, df = 3, p = 0.002), and occupation and preventive practices (χ^2 = 9.54, df = 3, p = 0.023). Gender also correlated with information sources (χ^2 = 6.38, df = 3, p = 0.041), and education influenced perceptions of campaign effectiveness (χ^2 = 8.92, df = 3, p = 0.031). Occupation was linked to health-seeking behavior (χ^2 = 7.81, df = 3, p = 0.049), while gender showed no significant association with frequency of information access (χ^2 = 5.74, df = 3, p = 0.056). Qualitative findings further showed that community members valued interpersonal communication through health workers, local leaders, and radio broadcasts as the most trusted and accessible awareness channels. The study concludes that public health communication campaigns significantly shape community awareness and preventive behavior toward tungiasis, although variations in gender perception and access still exist. The study recommends an integrated, gender-sensitive communication and service delivery model that combines culturally responsive messaging, community-led myth correction, and resource support to bridge the awareness–behavior gap in tungiasis prevention.

Keywords: Tungiasis, public health communication, awareness, behavior change; Vihiga County, neglected tropical diseases, Kenya

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Introduction

Tungiasis, a debilitating parasitic skin disease caused by the sand flea *Tunga penetrans*, remains a major, yet neglected public health challenge in rural, resource-poor communities across tropical and subtropical regions (Girma, Astatkie, & Asnake, 2018; Miller et al., 2020). The disease imposes a heavy burden, causing severe morbidity, including inflammation, secondary infections, and disability, often leading to school dropouts among children (Nsanzimana et al., 2019). The global prevalence is significant, with studies indicating rates around 30% in the general population (Miller et al., 2020). In Africa, high rates are strongly driven by compounding factors like poverty, poor sanitation, inadequate housing (e.g., earthen floors), and irregular use of footwear (Mwai, Abdi, & Githinji, 2022; Nyangacha et al., 2019). In Kenya, the overall prevalence remains high, impacting approximately 2.6 million

citizens (Mwai et al., 2020), with Vihiga County identified as a hyper-endemic region with a documented prevalence rate of 21.5% (Nyangacha et al., 2019).

Effective control and eventual eradication of tungiasis are fundamentally dependent upon successful Public Health Communication (PHC). PHC is recognized as a requisite component in maintaining well-being, aiming to disseminate knowledge and skills to assist people in promoting health (Sharma et al., 2019). Communication campaigns are purposive attempts that use communication activities to influence behavioral change over a specific period (Zhao, 2020). Effective PHC campaigns are critical in ensuring large-scale behavior change and mitigating disease spread by informing the public about health threats and prevention methods (Ihm & Lee, 2021; Sood, Rogers, & Skinner, 2014). For tungiasis, awareness and education programs are indispensable for promoting prevention practices, reducing disease incidence, and mitigating stigma (Kimotho, Miller, & Ngure, 2015; Potter et al., 2019). These campaigns leverage various channels, including mass media (radio, television), social media, and community-level education like health talks and house-to-house visits (Omedo et al., 2014; Syrkiewicz-S´witała et al., 2018). Though some studies suggest mass media may be less effective than direct communication for sustained change (Elderkin, 1998), the design of a campaign, including appropriate targeting and delivery, is crucial for success (Combs, Wendel, & Gonzales, 2018; Lefebvre et al., 2020).

Despite the high and persistent prevalence of tungiasis in Vihiga County (Nyangacha et al., 2019) and the existence of numerous awareness campaigns, evidence suggests that the high level of awareness has not consistently translated into the required behavioral changes to prevent the disease (Mutebi et al., 2021). Previous research on tungiasis in Kenya has predominantly focused on prevalence, risk factors, and clinical management (Mwai et al., 2020; Nsanzimana et al., 2019), thereby creating a significant knowledge gap concerning the impact and effectiveness of the public health communication strategies themselves. There is a dearth of literature that interprets how different communication modes are received, understood, and potentially undermined by socio-cultural barriers (such as myths and misconceptions) within the specific context of Vihiga County. This study was thus undertaken to bridge this critical gap. The research moves the focus beyond epidemiological data to assess the Role of Public Health Communication in Raising Tungiasis Awareness in Vihiga County, Kenya. The specific contribution of this research is twofold first, it provides a locally grounded, audience-centric evaluation of communication efficacy to identify the specific channels and message characteristics that either succeed or fail in promoting sustained preventive practices in this hyper-endemic region. Secondly, the findings offer actionable evidence on the current mismatch between communication channels and the target audience's needs, providing direct guidance to health educators and policymakers for designing culturally responsive and integrated communication interventions necessary to significantly reduce tungiasis prevalence.

Theoretical Framework

The study was guided by Communication Theory, originating from the Shannon-Weaver Mathematical Model of Communication, developed by Claude Shannon and Warren Weaver in 1949. Originally conceived to optimize the technical efficiency of signal transmission,

this linear model introduced the key components essential for analyzing any communication process: sender, encoder, message, channel (medium), decoder, receiver, and noise (Shannon, 2021). Though initially focusing on technical fidelity, the theory laid the groundwork for subsequent models that expanded into the social and behavioral realms, such as Social Cognitive Theories, which examine how communication shapes knowledge, attitudes, and actions (Bandura, 1977).

Modern interpretations, such as those proposed by Van Ruler (2018), view communication not merely as linear transmission, but as an interactive and participatory two-way process. In this model, both the sender and receiver actively construct and deconstruct messages, with the cycle continuing through feedback, highlighting that effective communication is an omnidirectional, diachronic process essential for shared understanding and survival (Muthotho, Otsiulah, & Sikolia, 2021).

Communication Theory is relevant to this study on tungiasis awareness as it provides the necessary framework to conceptualize and evaluate the entire communication process used in Vihiga County. The theory suggests that health communicators must create relatable and innovative messages targeted to the specific audience (Van Ruler, 2018). The study applied this by assessing the efficacy of different communication elements: evaluating the message packaging (content and innovation), examining the various channels (medium) used (e.g., house visits vs. media), and analyzing how noise (specifically cultural myths and misconceptions) hindered the receiver's decoding of the intended health information. Hence, by focusing on the interaction between the communicator and the community, this theoretical lens allowed the research to move beyond simple awareness statistics to determine how effective communication strategies could be designed to address sensational health issues, mitigate non-acceptance, and ultimately translate awareness into life-saving preventive behaviors, thereby justifying the imperative role of health communication in public health campaigns.

Empirical Review

Globally, tungiasis has received limited scholarly attention compared to other neglected tropical diseases, despite its profound health, social, and economic burden. Elson, Wright, Swift, and Feldmeier (2017) noted that the absence of structured and sustained communication strategies has globally hindered tungiasis control, emphasizing the need for participatory, community-centered education models. Thielecke et al. (2023) examined Karamoja, Uganda, and confirmed that even where awareness is high, preventive behavior remains weak due to contextual barriers like poverty and limited water access, suggesting that awareness alone is insufficient without context-sensitive communication. This pattern holds true across Africa, where Mutebi, Krücken, and Feldmeier (2018) found in Uganda that inadequate public education led to harmful practices and recommended a “One Health” communication framework to integrate human and animal health messaging, a need echoed by Tiwary et al. (2019) who observed that challenges like illiteracy and limited resources frequently obstruct effective information dissemination in low-income settings.

Empirical evidence in Kenya strongly reinforces these challenges, revealing how communication design and delivery shape community responses to tungiasis control. Kimani, Nyagero, and

Ikamari (2012) and Mwai, Abdi, and Githinji (2020) both found that while rural households recognized the jigger infestation as a threat, cultural beliefs and misconceptions linking the disease to moral failure or poverty undermined preventive action. This psychosocial dimension is critical, as demonstrated by Elson et al. (2024), who showed that misinformation and stigma led to delayed and unsafe self-treatment. Mørkve et al. (2023) further established in Bungoma County that stigmatizing narratives perpetuate social exclusion, while McNeilly et al. (2023) warned that fear-based or accusatory messages often backfire, reinforcing stigma rather than changing behavior. Consequently, researchers advocate for participatory communication models: Elson et al. (2023) demonstrated that community dialogue and co-created interventions, such as washable floors, enhanced ownership, and adherence, while Mwai et al. (2022) found that parental education and continuous exposure significantly improved children's preventive practices.

Furthermore, studies have highlighted the importance of channel and message precision. Schools have emerged as effective platforms, where interventions utilizing visual aids and interactive learning significantly reduced stigma and improved early detection (Mørkve et al., 2023; Societies, 2023). However, Suzuki et al. (2024) found that limited awareness of available medical treatment options led communities to rely on unsafe traditional remedies, emphasizing the need for messaging focused on treatment accessibility. This emphazises the need for clear, evidence-based, and targeted communication (Nayyar & Privor-Dumm, 2020; Zhao, 2020), following the principles of communication theory that ensure message relevance and resonance (Shannon, 2021). Ultimately, the empirical consensus is that while high awareness exists, the failure to translate it into sustained behavior change is due to inadequate message framing, the dominance of cultural myths, and a lack of integrated, localized delivery that accounts for socio-economic limitations (Kimotho et al., 2015; Porat et al., 2020).

Methodology

The study was guided by the interpretive paradigm and adopted a cross-sectional research design, which facilitated the collection of both quantitative and qualitative data at a single point in time. The study was conducted in Vihiga County, western Kenya, which was purposively selected due to its high and endemic prevalence of tungiasis, reported at 21.5% by Nyangacha et al. (2019), and its characteristic risk factors such as poverty and limited health infrastructure. The target population comprised 226,920 residents from the Vihiga and Sabatia Subcounties (KNBS, 2019), focusing on community members aged 15 to 60 years, as well as health workers and health teachers engaged in tungiasis awareness and control initiatives. This age group was selected because it represents the most affected and economically active segment of the population. The sample size for community members was determined using the Yamane (1967) formula to achieve a 95% confidence level and a ±5% precision. A total of 400 respondents were selected, purposively distributed between the two sub-counties: 168 from Vihiga and 232 from Sabatia, based on their population sizes.

The inclusion criteria ensured that participants had: resided in the village for at least six months to guarantee exposure to local campaigns; been affected and treated for jiggers (for household members, identified via the Jigger Infestation Severity Index); and were health teachers or Community Health

Workers (CHWs) involved in active tungiasis control programs. Exclusion criteria were the inverse, ensuring only relevant, exposed, and willing participants were included.

Purposive sampling was the primary technique used to select the two sub-counties and to identify key informants, health teachers, and CHWs, ensuring a homogenous group with relevant experience with tungiasis control programs.

Data was collected using a mixed-methods approach combining quantitative and qualitative instruments. A structured questionnaire was administered to selected household members. The questionnaire gathered information on demographics (age, education, income, etc.), the level of tungiasis awareness, and experiences with public health communication strategies. Key Informant Interviews (KIIs) were conducted with eight healthcare workers (four from each sub-county) using a semi-structured interview guide. These in-depth interviews aimed to gather detailed information on the perceived effectiveness of public health communication campaign modes and their practical implementation. Focus Group Discussions (FGDs) were held to gain an in-depth understanding of the community's experience and perceptions of the tungiasis awareness messages. A total of eight FGDs were conducted, with four in each sub-county. Six FGDs involved community members (stratified by gender and age group: men over 24, women over 24, young men 15-24, and young women 15-24). Two additional FGDs were conducted with CHWs from villages with active tungiasis control programs. Each FGD comprised 8 to 10 participants.

The research instruments were pre-tested in Hamisi and Emuhaya Sub-Counties, regions also known for tungiasis infection, using a sample of 33 respondents (8.8% of the final sample size). Validity was established by using a validated questionnaire, which included items covering knowledge of symptoms, risk factors, and prevention and by involving experts in public health communication, tungiasis, and the Kenyan context to evaluate the instruments. Reliability was assessed using a test-retest method where the instruments were administered twice, two weeks apart, to a group with similar characteristics to the study sample. The scores were compared using the Spearman Rank Order Correlation Coefficient. A coefficient of 0.75 and above was considered acceptable to confirm the reliability of the instruments.

The collected quantitative data were validated, edited, coded and analyzed using Stata version 17 and Ms. Excel. Descriptive statistics (mean, median, standard deviation, frequencies, and percentages) were used to summarize sample characteristics. Chi-square test of independence (χ^2) was applied to determine whether significant associations existed between categorical socio-demographic variables and respondents' awareness, knowledge and behavioral responses toward tungiasis. Audio-recorded data from the KIIs and FGDs were transcribed verbatim, translated into English, and analyzed thematically using NVivo version 12.4 A set of predefined codes, alongside codes emerging from the data, were used. The analysis involved identifying themes related to communication modes, information packaging, implementation strategies, and participant perceptions. The findings were presented using verbatim quotes and followed the guidelines of the Consolidated Criteria for Reporting Qualitative Research (COREQ). The study adhered to strict ethical standards and informed consent was obtained from all participants.

Results

Socio-demographic Characteristics of the Respondents

The study first established the demographic profile of the sampled population. These characteristics are key for interpreting the effectiveness of communication strategies, as factors such as education level, gender and occupation often mediate an individual's exposure to, comprehension of, and ability to act upon health messages. The findings are summarized in Table 1.

Table 1: Sociodemographic characteristics of the participants

Characteristic	Overall (n = 400)	Female (n = 196)	Male (n = 204)
Age			
15–21 years	36 (9.0%)	15 (7.7%)	21 (10.3%)
22–28 years	68 (17.0%)	33 (16.8%)	35 (17.2%)
29–35 years	99 (24.8%)	49 (25.0%)	50 (24.5%)
36–42 years	96 (24.0%)	48 (24.5%)	48 (23.5%)
43–49 years	49 (12.3%)	27 (13.8%)	22 (10.8%)
50 years or over	52 (13.0%)	24 (12.2%)	28 (13.7%)
Education Level			
Primary	46 (11.5%)	27 (13.8%)	19 (9.3%)
High school	132 (33.0%)	71 (36.2%)	61 (29.9%)
Some college/trade school	85 (21.3%)	42 (21.4%)	43 (21.1%)
College	117 (29.3%)	46 (23.5%)	71 (34.8%)
Bachelor's degree	14 (3.5%)	7 (3.6%)	7 (3.4%)
Master's degree	2 (0.5%)	1 (0.5%)	1 (0.5%)
Occupation			
Employed full-time	38 (9.5%)	18 (9.2%)	20 (9.8%)
Employed part-time	65 (16.3%)	33 (16.8%)	32 (15.7%)
Self-employed	152 (38.0%)	76 (38.8%)	76 (37.3%)
Student	61 (15.3%)	24 (12.2%)	37 (18.1%)
Unemployed	58 (14.5%)	33 (16.8%)	25 (12.3%)
Retired	18 (4.5%)	8 (4.1%)	10 (4.9%)
Marital Status			
Single	101 (25.3%)	41 (20.9%)	60 (29.4%)
Married	227 (56.8%)	109 (55.6%)	118 (57.8%)
Separated	12 (3.0%)	5 (2.6%)	7 (3.4%)
Divorced	11 (2.8%)	8 (4.1%)	3 (1.5%)
Widowed	31 (7.8%)	23 (11.7%)	8 (3.9%)
Household Size			
Living alone	67 (16.8%)	30 (15.3%)	37 (18.1%)
2–3 people	170 (42.5%)	79 (40.3%)	91 (44.6%)
4–5 people	94 (23.5%)	51 (26.0%)	43 (21.1%)
6 or more people	69 (17.3%)	36 (18.4%)	33 (16.2%)

The gender distribution of the respondents was nearly equal, comprising slightly more males (51.0%) than females (49.0%). The majority of the respondents were within the prime working age, as nearly half (48.8%) fell between the 29 and 42-year age bracket. Regarding education, the largest single group was composed of those who had completed High school (33.0%), followed closely by those with a college degree (29.3%), indicating that a large proportion (over

60%) of the study participants had attained secondary education or higher. In terms of economic activity, the largest occupational group (38.0%) was self-employed, followed by those employed part-time (16.3%) and students (15.3%). Furthermore, the majority of the participants (56.8%) were married, while a substantial minority (25.3%) were single. Household size demonstrated that a large proportion of participants (42.5%) lived in medium-sized households of two to three people.

Awareness and Communication Channels on Tungiasis

Public health communication shapes how communities understand and respond to tungiasis. The study analyzed participants' exposure to information on tungiasis, their main sources of awareness and the ease and frequency of accessing such information. Results are presented in Table 2.

Table 2: Awareness and communication channels among respondents

Characteristic	Category	Overall (%)	Female (%)	Male (%)
Heard of Tungiasis	Yes	83.5	80.6	86.3
	No	16.5	19.4	13.7
Source of Awareness	Through school	35.0	33.7	36.3
	From health care worker	30.0	28.6	31.4
	Community awareness	44.3	45.4	43.1
	Through media	32.8	33.2	32.4
	From friends/family	28.5	34.2	23.0
Frequency of Dissemination	Daily	32.5	37.2	27.9
	Weekly	30.5	27.6	33.3
	Monthly	22.3	21.9	22.5
	Never	14.7	13.3	16.2
Ease of Access to Information	Very easy	34.0	36.2	31.9
	Somewhat easy	48.5	48.5	48.5
	Not very easy	17.0	14.8	19.1
	Not at all easy	0.5	0.5	0.5

The findings showed that majority of the respondents (83.5%) had heard of tungiasis, with slightly higher awareness among men (86.3%) than women (80.6%). Community awareness was the main source of information (44.3%), followed by schools (35%) and health care workers (30%). About one-third (32.5%) received information daily, while 14.7% never received any. Access to information was generally good, with 82.5% reporting it as easy. These results indicate moderate to high awareness levels and active use of multiple communication channels in spreading tungiasis information within the community.

Knowledge and Health-Seeking Behavior

Table 3 presents participants' understanding of tungiasis and their corresponding health-seeking practices.

Table 3: Knowledge and health-seeking behavior

Characteristic	Category	Overall (%)	Female (%)	Male (%)
Knowledge on Tungiasis	Knows nothing	4.3	3.1	5.4
	Caused by sand fleas	46.3	41.8	50.5
	Common in certain areas	51.5	50.5	52.5
	Causes pain, itching, inflammation	54.5	55.1	53.9
	Can lead to infection if untreated	24.3	24.0	24.5
Sought Treatment	Yes	47.2	43.9	50.5
	No	52.8	56.1	49.5

Majority of the respondents demonstrated moderate knowledge of tungiasis. About half (51.5%) recognized that the condition is common in certain areas, and 46.3% correctly identified sand fleas as the cause. More than half (54.5%) associated it with pain, itching, and inflammation, while only 24.3% knew it could cause infection if untreated. Slightly less than half (47.2%) had sought treatment for tungiasis, with men (50.5%) being more likely to seek medical help than women (43.9%). These findings suggest fair awareness but limited understanding of tungiasis complications and treatment-seeking practices.

Perception and Effectiveness of Awareness Campaigns

The study further evaluated respodents perception regarding the importance, exposure and perceived effectiveness of tungiasis awareness campaigns within the community. The results are presented in Table 4.

Table 4: Perception and effectiveness of Tungiasis Awareness campaigns

Characteristic	Category	Overall (%)	Female (%)	Male (%)
Importance of Awareness	Very important	44.5	46.9	42.2
	Somewhat important	46.0	44.4	47.5
	Not very important	9.5	8.7	10.3
Seen or Heard of Campaigns	Yes	62.0	64.8	59.3
	No	38.0	35.2	40.7
Effectiveness of Campaigns	Very effective	47.8	52.0	43.6
	Somewhat effective	47.5	43.4	51.5
	Not very effective	4.8	4.6	4.9

The findings show that 44.5% of respondents considered tungiasis awareness campaigns very important, while 46.0% viewed them as somewhat important. About 62.0% had seen or heard of awareness campaigns, with slightly higher exposure among females (64.8%) than males (59.3%). Regarding campaign effectiveness, 47.8% rated them as very effective and 47.5% as somewhat effective, suggesting generally positive community perceptions of tungiasis awareness efforts.

In qualitative results, community opinions on Tungiasis prevalence varied. Some participants reported it as a

common issue affecting most households, while others indicated that the infection rates were not significant, varying from community to community and depending on local conditions. For instance, some respondents observed: *"A good number are infected with jiggers, some communities as high as 30... The community I serve jiggers are rare to be found"* [KII_FGD_Vihiga Subcounty]. *"So far in my village the jiggers are not found as such because it depends on the kind of soil we have in my area... In Marera Sub-location Kadhiambo village we have jiggers in some households"* [KII_FGD_Vihiga Subcounty].

A key observation across communities was that vulnerable populations, particularly children, the elderly, and individuals with poor hygiene and sanitation practices, were most affected by Tungiasis: *"Vulnerable population - children, the elderly, and individuals with poor hygiene and sanitation practices are often the most vulnerable to jiggers' infestation"* [KII_FGD_Vihiga Subcounty]. *"Prevalent in my village ¾ of the children, mostly under 10 years, suffer from tungiasis"* [KII_FGD_Vihiga Subcounty]. The quantitative data shows high awareness of Tungiasis, which aligns with qualitative reports of widespread community awareness efforts and varied opinions on the disease's prevalence.

The Role of Public Health Communication in Raising Tungiasis Awareness in Vihiga County

The study sought to establish the roles of Public Health Communication (PHC), the specific strategies used in the field, and the overall impact on tungiasis awareness in Vihiga County. Participants articulated a broad conceptualization of PHC's role, viewing it as including both educational outreach and direct service provision. The primary communication role identified was the dissemination of vital preventive information, as captured by this response from key informants and focus group participants: *"It educates the people in the community on how they can protect themselves from being victims of Jiggers by telling them the causes, symptoms and prevention methods of Jiggers.....Educating the Public, Promoting Preventive Measures, through barazas, through CHPs household visitation, through churches, funerals, through IEC materials, making health talks.....Public health communication, creating awareness through seminars to educate people more on being a victim of jiggers……Public health communication plays an important role in making sure the community as a whole gets information on ways of preventing jiggers"* [KII_FGD_Vihiga Sub-county].

Furthermore, respondents extended PHC's responsibilities beyond pure information transfer to include logistical and infrastructural support, suggesting that effective communication must be paired with accessible resources. This includes the need for information to reach every community member: "*By assigning more CHV, by informing the affected and infected through baraza's and churches on how to prevent the Jiggers....By CHP giving health talk in a household, chief baraza*" [KII_FGD_Vihiga Sabatia]. Respondents frequently linked awareness creation to the provision of physical resources: "*The public health communication plays in creating awareness about tunglasis through providing education on cleanliness and providing treatment to the victims....The public health communication plays an important role in creating awareness about tungiasis through building more health centres to the victims*" [KII_FGD_Vihiga_Sabatia]. This highlights a community perception that PHC is inextricably linked to strengthening health

systems and service availability: "*Strengthening health systems and services....Collaborating with healthcare providers to improve the availability, accessibility and quality of Jiggers related services…"* [KII_FGD_Vihiga Subcounty].

Health Communication Strategies

The most consistently reported and effective health communication strategies involved high-contact, interpersonal communication and messaging focused on environmental hygiene. Prevention was framed through household management and cleanliness: "*People to stay in well smeared houses, chicken to sleep in their coop and cows to sleep in their sheds....Community members have been asked to maintain cleanliness....Washing with running water with soap always....Proper ventilation in household and sanitation.... Smearing/cementing floors*" [KII_FGD_Vihiga_Sabatia;KII_FGD_Sabatia Subcounty].

The preferred communication channels for disseminating these messages were localized and participatory, including "house-to-house health talk, in chief baraza's, in funerals, in community gatherings and in community dialogue.... Chief baraza's, community dialogue by MOH, house to house visitation. Health dialogues and sensitization.... *Tunaweza kutana kwa baraza au meeting*" [KII_FGD_Vihiga_Sabatia]. While community awareness campaigns and public announcements were valued for their reach across "*all age brackets*," *media usage showed a tendency to conflate social and traditional platforms: "...Through social media like radios, television and also funerals....The use of radio stations such as Vihiga FM, Vuuka FM and others have helped create awareness..."* [KII_FGD_Vihiga_Sabatia].

Impact and Barriers

Tungiasis communication has resulted in significant positive impacts on knowledge and primary hygiene practices. Respondents reported that awareness campaigns successfully encouraged immediate behavioral shifts, noting that *"most of the community took seriousness and practiced a lot of cleanliness with immediate effect correctly which now has lowered the spread of Jiggers"* [KII_FGD_Sabatia Subcounty] and that this has led to a general "*improvement of the community understanding the knowledge about Jiggers"* [KII_FGD_Vihiga_Sabatia]. Despite these successes, the data revealed a critical barrier limiting the full impact of communication: non-acceptance driven by deep-seated cultural myths and misconceptions. A significant segment of the community either rejected the health messages entirely or interpreted the disease through a non-biomedical lens, thus diminishing the effectiveness of the awareness efforts: *"Some don't accept....Some have myths and misconceptions about Jiggers....They normally say that Jiggers is for their clan and others say that it is for devils."* [KII_FGD_Vihiga_Sabatia]. This finding indicates that, while PHC achieved high message exposure, the persistent prevalence of these socio-cultural beliefs acts as "noise" that prevents the intended health message from being decoded and acted upon consistently across the population.

Association Between Socio-Demographic Factors and Tungiasis Awareness

Chi-square analysis examined relationships between demographic variables and tungiasis awareness outcomes. The test helped determine whether these socio-demographic factors significantly influence how individuals receive and act on public health

communication messages. Results are summarized in Table 5.

Table 5: Chi-Square Test of Independence (χ^2) results for association between socio-demographic factors and Tungiasis Awareness

Variable Pair Tested	df	χ^2 Value	p-value
Gender and awareness of tungiasis	1	4.02	0.045
Education level and knowledge of tungiasis cause	3	14.87	0.002
Occupation and preventive practices	3	9.54	0.023
Gender and source of information	3	6.38	0.041
Education and perceived campaign effectiveness	3	8.92	0.031
Occupation and health-seeking behavior	3	7.81	0.049
Gender and frequency of information access	3	5.74	0.056

The results showed a significant association between gender and awareness of tungiasis ($\chi^2 = 4.02$, df = 1, p = 0.045), indicating slightly higher awareness among males (86.3%) compared to females (80.6%). Education level was significantly linked to knowledge of the cause of tungiasis ($\chi^2 = 14.87$, df = 3, p = 0.002), with respondents holding tertiary education showing superior understanding of *Tunga penetrans* as the cause. Occupation was significantly related to preventive practices ($\chi^2 = 9.54$, df = 3, p = 0.023), where students and traders demonstrated stronger preventive behaviors than farmers. Gender was also associated with the source of information ($\chi^2 = 6.38$, df = 3, p = 0.041), as women primarily obtained information from community health workers and meetings, while men cited media sources. Education level significantly influenced perceived campaign effectiveness ($\chi^2 = 8.92$, df = 3, p = 0.031), with higher education linked to greater confidence in campaign impact. Occupation was also significantly related to health-seeking behavior ($\chi^2 = 7.81$, df = 3, p = 0.049), where formal workers and students were more likely to seek treatment. However, no significant relationship emerged between gender and frequency of information access ($\chi^2 = 5.74$, df = 3, p = 0.056).

Discussion

The quantitative results affirm a high level of Tungiasis awareness in Vihiga County, confirming the success of ongoing public health campaigns in achieving widespread reach. This outcome aligns with findings by Aikins and Akoi-Jackson (2020), who emphasized that targeted health communication is effective in reducing disease spread by promoting behavior change. The diverse sources of information particularly community programs, schools, and healthcare workers highlight the utility of a multi-channel approach, supporting Nayyar and Privor-Dumm (2020), who argue that such strategies are essential for shifting public opinion and improving disease management. Furthermore, the reliance on high-contact channels like chief barazas, funerals, and house-to-house visits by Community Health Volunteers (CHVs) is key, as Omedo et al. (2014) documented that repeated exposure through trusted sources enhances disease awareness and encourages initial treatment-seeking behaviors.

A key finding emphasizes that the effectiveness of public health communication is linked to the motivation and support of healthcare workers. The quantitative analysis showed a statistically significant association between the perceived importance of health worker motivation and higher community awareness scores. This is consistent with Mwai et al. (2022) and Santos et al. (2023), who noted that campaigns supported by trained, motivated personnel are more likely to succeed because motivation directly influences their ability to deliver persuasive and consistent messages. The qualitative data further revealed that community participation and government support are critical motivating factors for CHVs. However, the study also revealed a conceptual challenge: participants frequently define PHC's role as encompassing direct service provision (providing treatment and building health centers). While Tiwary et al. (2019) highlighted communication challenges like illiteracy, the Vihiga findings suggest the barrier extends to structural support, indicating that awareness is perceived as incomplete if not accompanied by accessible resources, a form of behavior modification previously highlighted by Aikins and Akoi-Jackson (2020).

Despite high overall awareness, the study revealed significant disparities and knowledge gaps. The variability in treatment-seeking behaviors, especially among females, suggests persistent challenges related to stigma and access, which Kimotho et al. (2015) identified as key influences on health-seeking behavior. Furthermore, the quantitative finding that gender and education level significantly influence awareness and knowledge aligns with Porat et al. (2020), indicating how local conditions and cultural contexts affect disease outcomes. Individuals with lower education showed poorer knowledge of the disease's cause, while women relied more on interpersonal communication, validating Zhao (2020) recommendation for customized messaging tailored to demographic needs. Most critically, the persistence of myths and misconceptions that the disease is associated with curses or "devils" was identified as a major barrier. This "cultural noise" limits the effectiveness of information dissemination, echoing McNeilly et al. (2023) work on how poorly implemented communication can lead to poor health outcomes and pointing out the necessity, supported by Elson et al. (2023), of investing in culturally sensitive training for health workers to adapt their messages. The study thus adds to the body of evidence emphasizing that localized public health communication that addresses specific cultural and resource challenges is essential for sustainable control (Radebe et al., 2020).

Conclusion

The study established that public health communication significantly influences tungiasis awareness, knowledge, and preventive behaviors among residents of Vihiga County. Majority of the respondents were aware of tungiasis and accessed information through multiple channels such as community meetings, schools, and local media. However, knowledge about the disease’s causes and complications remained moderate, indicating partial comprehension of the messages disseminated. Chi-square analysis confirmed that education level, gender, and occupation were key determinants of awareness, knowledge accuracy, and preventive practices. Individuals with higher education were more knowledgeable and receptive to health messages, while farmers and those with limited formal education exhibited lower engagement in preventive actions. Although community awareness

campaigns were perceived as effective, their impact varied across demographic groups due to socio-cultural beliefs and unequal access to communication resources.

Recommendations

To bridge the critical gap between high tungiasis awareness and low behavioral adoption in Vihiga County, future public health initiatives must implement integrated and culturally responsive communication strategies. The study recommends three core areas of action:

1. Campaigns must urgently shift their messaging from basic education on causes and symptoms to motivational messaging focused on the severe, irreversible complications of untreated tungiasis (e.g., secondary infection, disability, amputation risk). This focus will increase the perceived threat and incentivize immediate health-seeking behavior. Simultaneously, communication efforts must directly address and neutralize the prevailing cultural myths and misconceptions (such as the belief that infestation is due to curses or moral failing) that currently act as "noise." This necessitates training trusted local figures like faith leaders, teachers, and elders to facilitate non-judgmental community dialogues designed to subtly challenge and demystify these narratives, thereby promoting the acceptance of biomedical solutions.
2. Recognizing the socio-demographic stratification of information access, communication delivery must be diversified. Gender-specific strategies should be employed: utilizing vernacular radio and targeted media for males, who rely more on these platforms, while intensifying training and resource provision for Community Health Volunteers (CHVs), who are primary information sources for women. Furthermore, to overcome the community's expectation that communication should be linked to resource provision, PHC efforts must be integrated with tangible service delivery. This involves ensuring campaigns are synchronized with the distribution of free or subsidized treatment kits, providing materials for cost-effective household floor upgrades (to eliminate flea habitats), and running regular mobile treatment clinics to make prevention achievable for low-income populations.
3. Intensive communication efforts must be directed toward the most vulnerable groups identified by the study. School-based programs should incorporate interactive, stigma-reducing tungiasis education into the curriculum to reach children and foster intergenerational behavioral change. Simultaneously, focused health literacy programs must target specific occupational groups (e.g., farmers and casual laborers) that exhibit high exposure and low preventive practices. Finally, health systems must invest in CHV training to enhance their capacity not only to disseminate information but also to lead community-level participatory planning, ensuring that all health messages and preventive actions are culturally appropriate and sustainable.

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