

**Institute of Health, Faculty of Public Health,
Department of Health, Behavior, and Society**



**Content Analysis of Messages In primary School Students' Malaria Poems in
Jimma Zone, Oromia, Ethiopia: A qualitative study**

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Jimma, Ethiopia

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Abstract

Background: Engagement of school students in malaria prevention and control is an essential strategy. Pieces of evidences indicated students were potent messengers and change agents for public health challenges. Nonetheless, little is known about the involvement of students in message development and dissemination.

Objective: This study was aimed to explore malaria message contents of poems generated by primary school students.

Methods: A qualitative content analysis approach was conducted on malaria poems generated by primary school students. Twenty poems were purposively selected from twenty schools across rural villages in five districts of Jimma Zone. Conventional and summative approaches were used to analyze the poems using Atlas.ti version 7.1.4 software. Message contents with metaphors were presented using central themes, categories, and specifications with supportive quotations. Finally, message contents were quantified based on the frequency of occurrence.

Results: A total of 602 specific malaria contents were generated across twenty poems. The contents were put into twenty one categories that were lined-up along five central themes. Knowledge about malaria and its prevention methods, threat perception from malaria and risk condition, misconceptions and malpractices, effectiveness of preventive methods, and calls to adaptations of practices were the five central themes. Metaphors, simile, and personifications were the commonest ones used by students for composing their poem. Message about severity of malaria (101=16.8%), distinguishable signs and symptoms (66=11%), manifest calls to practice of malaria prevention and elimination (63=10.5%), and effectiveness of ITN use (49=8.1%) were the commonest conveyed contents.

Conclusion: Messages about severity of malaria, signs and symptoms, calls to practice of malaria elimination, and effectiveness of ITN use were the commonest conveyed contents. Nonetheless, messages about vulnerability and seeking of treatment for fever were low. So, it is important to encourage the students to design messages that increases perception of community members remains susceptible to malaria and to seek treatment for fever. Metaphoric expressions; war and death; and personification of mosquitoes as men doing evil in wiles were used to convey message about severity and ITN usage metaphorically represented as a trap to mosquitoes.

Keywords: Content analysis, Poems, Malaria communication, Schools, Jimma zone, Ethiopia.

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List of Acronyms and Abbreviations

ACT: Artemisinin-Based combination Therapy

AIM: Action and Investment to Defeat Malaria 2016-2030: for a Malaria Free World

CDC: Centers for Disease Control and Prevention

FMOH: Ethiopian Federal Ministry of Health

FY: Fiscal year

GMP: Global Malaria Programme

GTS: Global Technical Strategy for malaria (2016–2030)

IPTp: Intermittent Preventive Treatment for pregnant women

IRS: Indoor Residual Spraying

ITN: Insecticide-Treated Mosquito Net

LLIN: Long-Lasting Insecticidal Net

MOP: Malaria Operational Plan

NMCP: National Malaria Control Programme

RDT: Rapid diagnostic Test

SBCC: Social and Behavioral Change Communication

SNNPR: Southern Nation & Nationalities Peoples' Region

PMI: US President's Malaria Initiative

RBM: RBM Partnership to End Malaria

REC: Regional Economic Community

UNICEF: United Nations Children's Fund

USAID: United States Agency for International Development

WHO: World Health Organization

1 CHAPTER ONE: INTRODUCTION

1.1 Background

Magnitudes of malaria morbidities and mortalities are still important globally, regionally, and nationally compared to the goals of elimination by 2030 (1,2). Oromia is the most malaria prone region in Ethiopia with large number of malaria related risks and death (3). Jimma appears to be one of the endemic zones of Oromia although a declining trend was observed(4). There are several global initiatives and commitments to support the efforts of eliminating malaria (5–8). Community participations and ownership, communication interventions for social and behavior changes, and scale up of workable interventions proven to enhance malaria knowledge, attitude, and practices were some of the key strategies supported by malaria programs locally and globally(3,9–13).

Social and behavior change communication (SBCC) programs, strategies, and activities are emerging elements of effective global direction for eliminating malaria (11–17). Pieces of evidences indicate that approaching SBCC through school is one of the proven effective and efficient means of disseminating information to students and their families. School children and teachers are key agents for communicating and encouraging parents and community-wide malaria prevention and control (3,18–22).

One of the school-based SBCC intervention packages that were conducted in the Jimma zone of Oromia, by 2017-19 was involving primary school students in developing and disseminating messages to schools and broader communities. Students, particularly those who were members of health/malaria and mini-media/art clubs were supported to engage in developing artistic malaria communication materials including dramas, news, and poems in local language (Afan Oromo). Then, they disseminated their materials and messages through mini-media, peer discussions, school parent days, community meetings, and during school opening and closing occasions(3,18,22).

Poems are pieces of lines of writing arranged in patterns to express ideas that depicts human experiences, beliefs, views, imaginations, and evokes different emotions. Poems commonly have titles, dominating words, stories, connotative meanings, and hidden meanings to be searched

based on figurative languages (a word or phrase that a meaning is different from the literal interpretation of language) (23–27).

The analysis of poems involve reading the poems; analyzing the lines against the titles; investigating emotions, words, and stories in the poems; interpreting figurative languages (26–29). The following are some of the types of key figurative speeches: metaphors, asserts the identity, without a connective such as “like” or a verb as “appears”, of terms that are literally incompatible; similes, unrealistic comparison is made, using like or as; personification, assigning of human characteristics to non-humans; synecdoche, is the whole is replaced by the part or the part by the whole; irony, is a statement or a situation meaning is contradicted by the presentation of the idea; metonymy, something is named that replaces something closely related to it; and paradox, is statement that seems self-contradictory but may contain an insight into life (26–31).

Content analysis is a research methods that explore the content or information and symbols contained in written documents or other communication media (in this case poems) and to explore linguistic expressions and affective, cognitive, social, cultural, and historical significances (32,33). Exploring and analyzing the message contents of malaria poems developed and communicated by primary school students has multiple purposes. These are: to understand the contents of messages conveyed through the poems, collect experiences of communicating in contexts i.e. local mental models and beliefs, evaluate and adapt lessons about the students’ roles in malaria communication, and empower schools and students in successful message developments for public health programs. Therefore, this study aimed to analyze and explore message contents of malaria poems developed by primary school students, for malaria education.

1.2 Statement of problems

Even though many efforts have been made, malaria and its problems continued to affect generation worldwide. Globally, an estimated 228 million cases and 405,000 deaths of malaria occurred in 2018. In Africa, 213 million of cases and 380,000 deaths from malaria occurred which is 93% of malaria cases and 94% of deaths worldwide. Between June 2016 and July 2017, a total of 1,755,748 malaria cases and 356 deaths from malaria were occurred in Ethiopia indicating the diseases is still the public health problem of the country (1,2). Oromia is the most malaria prone region with large number of malaria related risks and death in Ethiopia (3).

Malaria is not the only ill-health causes, but also economic burden. For example, globally, in 2018, an estimated US\$ 2.7 billion was invested by different governments from malaria endemic countries and also international partners'(2). In addition, the diseases remain a major health problem for school children in sub-Saharan Africa as the disease is the main contributor to anemia, malnutrition, mortality, impaired cognition and poor school performance which are an important hidden burdens of malaria, which may prevent children from achieving their full educational potential (34).

In order to reduce these global public health problem, WHO and different countries including Ethiopia, developed and implemented national and sub-national plan, policies, initiatives and strategies towards malaria prevention control, and elimination(5,8,11). Global technical strategy along with RBM Partnership to combat malaria developed strategy to accelerate progress of malaria elimination from 2016 up to 2030 (5,6). PMI also supporting many countries and partners through a five core strategic approach to reduce malaria deaths and morbidity toward the long-term goal of elimination (3,7,8,12).

In Africa, PMI and its partners recommended ITN use with priority for pregnant women and all children under five, IRS in high burden malaria areas, promoting quick treatment of fevers, improving behavioral factors related to knowledge, misconception, self -efficacy, and perceived risk by using multiple communication channels and tools, like interpersonal communication, mass media ,information and communications technology (3,13,20).

A total of 578 million ITNs were distributed globally, between 2016 and 2018. In 2018, about 197 million ITNs were delivered by manufacturers, of which more than 87% were delivered to

countries in sub-Saharan Africa including Ethiopia (1). In 2017, IRS achieved 98.7 percent coverage in high burden districts of Benishangul-Gumuz and Oromia Regions. In addition, 29.6 million ITN were distributed to protect all Ethiopians living in areas with ongoing malaria transmission, representing 60 percent of the total population (3). However, malaria incidences and its burden continued static between 2014 and 2018 given that utilization of the recommended prevention and control strategies were low. For instance, in 2018, only half of the people were slept under an ITN in Sub-Saharan Africa, 32 % of respondents were slept under ITN in Liberia (1,14). In Jimma zone, ITN utilization was 37.1% in Gomma, 22.1% in Kersa and 18.3% Seka Chekorsa. The common barrier to use ITN were low risk perception, decreased awareness, negligence, and perceived low efficacy of ITNs (15,16). In Jimma Zone the transmission of malaria still continued with the decrement of house structures sprayed from 23.5% in 2015 to 10% in 2018 (17).

In addition, between 2015 and 2018, in sub-Saharan Africa a high proportion of febrile children did not receive any medical attention (1). Another problems were lack of LLINs and IRS acceptance and use, lack of strengthening a culture for malaria prevention and treatment-seeking behavior, ideational factors (beliefs, attitudes, perceptions, and values), cognitive factors (social norms and attitudes) (7,8,35).

Since most of these problems are related with behavioral failure of community in following malaria prevention and control strategies, behavioral change intervention is imperative (13). Schools are proven potent vehicles for SBCC among students and with the community at large to improve the capacity, knowledge, and decision-making skills that help to promote health and prevent diseases. Currently, school based SBCC malaria programs and activities have been implemented in Jimma zone (3,18,21).

Even though students are developed and disseminated malaria messages in the poems in school from 2017-2019, the content of malaria message in the poems is not explored and analyzed or the plausibility of the poems contents is unknown. Furthermore, to the knowledge of investigator, no published evidence is available on content analysis of messages of malaria poems developed and communicated by students. Therefore, this study fills this gap by exploring and analyzing the contents of malaria message in the poems.

1.3 Significance of the study

The result of the study might be helpful to Oromia regional health, health communication sector Jimma zone health office, District Health Office, for researchers and school community.

The result of this study might be helpful: To Oromia regional health and health communication sectors for developing effective School based malaria intervention and designing effective malaria message in school. For Jimma zone health office and district health office, by giving information towards malaria prevention, control, and elimination to implement different intervention like health education, community mobilization and conducting discussion with school community on malaria message development. For researchers might be used as baseline information to conduct content analysis studies in malaria messages. For school community: to scale up the role of school in disease prevention, and health promotion; and to identify their strength and gap on malaria message development. Therefore, this study aimed to explore and analyze the contents of malaria messages in the poems locally produced by the primary school students.

2 CHAPTER TWO: LITERATURE REVIEW

To reduce the impact of malaria on the health of the public globally; many regional countries are utilized school-based social behavioral change communication approach, national and sub national plan ,initiatives and strategies and school based malaria prevention and control to fight and eliminate malaria with best preventing , controlling, treating , and elimination mechanisms. Because malaria control saves lives today and prevents deaths tomorrow as a result it can support directly the achievement of broader development goals as better health contributes to poverty alleviation (36).

2.1 The Nature of Poems

Poem is a piece of writing arranged in patterns of lines and sounds which often rhyme, expressing thoughts, emotions, and experience in words that excited your imagination (24). Poem can be written for different reasons and different purpose. Some poems are written purely, to certain us, others solely for moral persuasion. There are two aspects of reading poem. One is the nature of the genre itself which involves looking the importance of titles, openings and endings; connotation; the role of a persona narrating a poem; the way syntax and structure can affect the reading of a poem (25). The second is importance of ambiguity in a reading, rather than certainty. Interpretation of poems relies on intellectual comprehension and rational understanding rather than on emotional apprehension and response (26).

There are several elements of poems like imagery which consists of visual imagery, auditory imagery, internal situation and olfactory imagery, rhythm which is a gesture arrangement, the sequence of repetition sound and causing the sound variations which create the living gesture and in language it is the changes of going up and down, long and short, hard and soft of the speech language sound. whereas, rhyme is the repetition of sound of the last word in two or more lines of poetry), theme is set forth the poems views on a subject) and last element of poem is Sound. In another classification poems it has two elements, which are intrinsic (theme; sense feeling, tone, and aim or intention and extrinsic element which is the structure or the method of poetry, a poem different from other literature forms. Knowing the elements of poems is important to differentiate among each other(26).

Some of the principles and instruction of poems that can help understanding process on the poems are giving attention to the title of poem, seeing the dominant words, understanding the connotative meaning, searching and finding the hidden meaning. The two kinds of poems are

narrative and lyric poems. Narrative poem is a stress story and action, whereas, lyric poems is a stress song and emotion. Narrative poem includes epic, and ballad while lyric poems characterized by brevity, melody, and emotional intensity, and it consists elegy, epigraph, sonnet, sestina, aubade, and villanelle (26,27).

2.2 Approach of Analyzing Poems

A typical poem analysis passes through the following processes: reading the title or reviewing the title of the poem to answer the first impression of the title, the poem will be about, how the poems sounds (boring, interesting, worrying, no thoughts at all). Reading the poem at least twice slowly, preferably, loudly in a normal speaking voice, to notice about the structure of the poem, number of stanzas, rhyming element, sound elements and interesting punctuation. Underlining unfamiliar words or phrases or circle unfamiliar vocabulary or words with interesting connotations and look them up in a dictionary and jot the meanings down. Making inferences about the poet. Looking at structure and language or setting of the poem (concrete, abstract), form (haiku, sonnet, or free verse,) structure (rhyme scheme, metre, stanza, thematic structure (plot), sounds and transitions), figurative language (simile, metaphor, personification, hyperbole) language used connotative words and phrases (different meanings, feelings, symbols, and themes) and voice or tone of word (28,29).

2.3 The Nature of Figurative Language

Figurative language is a word or phrase that a meaning is different from the literal interpretation of language or straight-forward use of words for the sake of comparison, emphasis, clarity, freshness, special effect, colorful and forceful writing(26).

There are eleven types of figurative language those are alliteration which is the repetition of the first letters or sounds in words (26). Hyperbole/Overstatement is exaggeration of a statement(26). Irony is a statement or a situation meaning is contradicted by the appearance or presentation of the idea(30). Litotes/Understatement is emphasizing the magnitude of a statement by denying its opposite). Metaphor asserts the identity, without a connective such as “like” or a verb as “appears”, of terms that are literally incompatible(30). Metonymy something is named that replaces something closely related to it (30) Paradox is a term in rhetoric for a situation or statement that seems self-contradictory and even absurd, but may contain an insight into life (31) Personification assigning of human characteristics to non-humans (26). Pun is a play on words; sometimes on different senses of the same word (26). Simile is a figure of speech, in which a

more or less fanciful or Unrealistic comparison is made, using like or as (31). Synecdoche is the whole is replaced by the part or the part by the whole (30).

2.4 Qualitative content analysis

Qualitative content analysis is one of numerous research methods used to analyze text data. Other methods include ethnography, grounded theory, phenomenology, and historical research (37). The goal of content analysis is to provide knowledge and understanding of the phenomenon under the study (38).

There are three approaches to qualitative content analysis: conventional, directed, and summative. All of the three approaches are used to interpret meaning from the content of text data. The major differences among the approaches are coding schemes, origins of codes, and threats to trustworthiness(39).

In conventional content analysis, coding categories are derived directly from text data. In the directed approach, analysis starts with a theory or relevant research findings as guidance for initial codes. Whereas, summative content analysis starts by identifying and quantifying certain words or content in text with the purpose of understanding the contextual use of the words or content. It has manifest content analysis which is used to analyze the appearance of a particular word or content in textual material(39). Latent content analysis which is the process of interpretation and discovering underlying meanings of the words or content(40)

2.5 Steps of qualitative content analysis

All qualitative content analysis approaches have similar analytical process those are, formulating the research questions to be answered, selecting the sample to be analyzed, defining the categories to be applied, outlining the coding process and the coder training, implementing the coding process, determining trustworthiness, and analyzing the results of the coding process (40).

2.6 Contents of malaria messages from different secondary resource

According to a multi-Country Study of Content Analysis of 35 Primary and Secondary School Textbooks, more than half of the text book contained about transmission mode ,cause /agent, preventive measure and epidemiology such as, 77.1% contained information regarding transmission mode/vector , 54.3% of which 13 (37.1%) were by specifying anopheles mosquito. cause/agent, 60.0%, of which 8 (22.9%) named the cause/agent, specifying plasmodium preventive measure , and 57.1% epidemiology and less than half of the textbooks contained

content regarding signs/symptoms (37.1%) and treatment (22.9%). Children should be equipped with knowledge and skills to recognize symptoms of malaria and to make an appropriate treatment choice and the need to seek care from a health worker (8.6%). The most commonly included preventive measure was the use of bed nets (40.0%) and source control by environmental modification (40.0%), followed by cleaning/weeding grass in and around the house compound (34.3%) and use of sprays (22.9%) (41).

National malaria guideline of Ethiopia forwarded environmental manipulation, IRS, and LLINs as the three major vector control measures. like this, diagnosis and treatment of malaria are parts of intervention in the country (42). And also sleeping under ITN, spraying IRS, and environmental modification are the core intervention recommended by WHO(43).

The main strategies to increase bed net use are: utilizing SBCC materials like poster, pamphlets, and mass media systems and community-based social communication activities, like SBCC toolkits at focal discussion group antenatal care clinics. The main factors to use bed net: knowledge gaps between provider and end user, miss use of bed net, using only during high transmission seasons, and inadequate surveillance. The key message for bed net utilization: tucking the edges under the mattress, giving priority to pregnant women and under five children, sleeping under bed net every family members every night, washing bed net with regular soap, drying under shade, and don't miss use bed net(42).

Key messages and instruction during spraying IRS are: informing the schedule of spraying and purpose of IRS for households, giving time to prepare and vacate, leaving occupants before spraying, removing of all households items, not spraying the households which occupied by sick people who cannot be moved, moving, covering, taking out furniture to allow easy access for spraying walls, faraway the tether and domestic animals. Advising the occupants to stay outside till two hours, to sweep floor before children re-entered the house, not to clean the sprayed surface, not to re-plaster a sprayed home till six month after spraying(42,43).

The potential mosquito breeding sites measures taken to prevent and control malaria are: avoiding water bodies, filling and leveling burrows and pits, and removing materials that hold water, constructing drainage ditches and planting water to dried up the swampy and marshy area, filling, draining, or connecting intermittent rivers, and streams(9,42).

Ensuring early and effective treatment will prevent uncomplicated malaria from progressing to severe and fatal illness. Early treatment seeking behavior and drug adherence can be overcome

with appropriate SBCC messages but the SBCC messages should include: considering malaria as a killer disease, if treatment is not sought early and treatment is taken properly. Taking to the nearest health facility immediately (within 24 hours.), if a family members has a fever. Don't interrupting the anti-malarial drugs prescribed by health providers. Coming back to the health facility after three days if no improvement in symptoms after malaria treatment or any time if there is worsening of symptoms

2.7 School-based SBCC strategy

According to school-based study conducted in five districts of Jimma zone revealed that, effectiveness of school-based SBCC strategy to produce significant change in comprehensive knowledge, message acceptance, practices of ITN utilization, giving priority to children <5 years old and pregnant women, environmental cleaning specifically breeding site of mosquito, not plastering or painting walls within 6 months of spraying and early treatment-seeking for fever. And also it stated that need of further investigation to understand concerning course of existence between risk perception, attitude, and practice and requirement of risk appraisal message for malaria prevention(22).

So, this study was explored and analyzed the contents of the message in the malaria poems that are locally produced by the primary school students with respect to behavioral models specifically with EPPM construct that are made up perceived susceptibility, perceived severity, perceived self-efficacy, and perceived response efficacy which result in perceived threat and perceived efficacy. Therefore, this content analysis study was explored the contents of the message that are locally produced by the primary school students. Specifically, the study is aimed to analyze the content of poems locally produced by primary school students against behavioral models that are made up of knowledge, self-efficacy, attitude, risk/severity perception and practices, Jimma zone.

2.8 Research Questions

RQ1: What are the contents included in poems developed and disseminated malaria messages that were related to malaria prevention, control and elimination?

RQ2: What types of metaphors were utilized while developing the poems which are used to convey about beliefs, norms and practices related to malaria?

3 CHAPTER THREE: OBJECTIVES

3.1 General objective

- To explore the contents and utilized metaphors of malaria messages in the poem produced and disseminated by primary school students in Jimma Zone, Ethiopia.

3.2 Specific objectives

- To describe the contents related to malaria prevention, control, and elimination in the malaria poem's message produced and disseminated by primary school students in Jimma Zone, Ethiopia.
- To identify utilized metaphors to convey belief, norms, and practice in the malaria poem's message which produced and disseminated by primary school students in Jimma, Zone, Ethiopia.

4 CHAPTER FOUR: METHODS AND MATERIALS

4.1 Study Setting and Period

Jimma zone is one of the largest zone of Oromia regions. It has 23 districts, and 42 urban and 513 rural gandas. The total population of Jimma Zone is estimated to be 3.2 million with the majority of the population living in rural areas (44). The study was conducted in primary schools of twenty rural gandas (the lowest government administrative bodies in Oromia) of the Jimma Zone between March to April 2020. The study schools have been centers of execution for a two-year school-based malaria project aimed to advance community practices from 2017-19 and in five selected higher malaria burden districts of the zone; Limmu-Kosa, Botor-Tolay, Gera, Shebe-Sombo, and Nono-Benja. The districts are at 70–229 K.M distance from Jimma town, the capital of the zone. In those schools the project engaged students as malaria messengers and artistic message developers for in-school, community, and opportunistic disseminations.

4.2 Study design

A qualitative content analysis was conducted on malaria poems generated by primary school students using conventional and summative approaches. Qualitative content analysis is used to analyze texts, and messages of communication materials to provide knowledge and understanding of the phenomenon under study (37,38,40). In this case, school-based communication materials (poems) generated at schools by students was analyzed.

There are three approaches to qualitative content analysis: conventional, directed, and summative. All of the three approaches are used to interpret meaning from the content of text data. The major differences among the approaches are coding schemes, origins of codes, and threats to trustworthiness(39).

In conventional content analysis, coding categories are derived directly from text data. In the directed approach, analysis starts with a theory or relevant research findings as guidance for initial codes. Whereas, summative content analysis starts by identifying and quantifying certain words or content in text with the purpose of understanding the contextual use of the words or content. It has manifest content analysis which is used to analyze the appearance of a particular word or content in textual material(39). Latent content analysis which is the process of interpretation and discovering underlying meanings of the words or content(40)

The current study mainly applied conventional content analysis approach because it is an appropriate approach for research questions and coding categories were derived directly from the poems and summative content analysis to look on figurative speeches and contexts use of key known malaria preventive actions. More over to give interpretation of underline meaning by using metaphor and quantification supported the poems’ underlying message contents to compare frequencies of appearance.

4.3 Population and sampling

Over the school-based malaria SBCC project periods, (2017-2019), students were generating poems in all the twenty study schools. All poems ever produced in those schools were parent population. The poems were collected from 20 selected schools across the high and medium malaria burden gandas in project targeted districts with the assessments of Jimma Zonal health department. Selected poems were considered for content analysis. Table 1 presents distribution of the poems considered for analysis. Initially, eighty poems were selected across the study schools from a total count of 657 poems. Criteria sampling technique was used to select poems from school documentation based on content richness, readability, and representations by villages, schools, grades, and gender of the poet students. Poems that were poor handwriting (unreadable), very short, and shallow in terms of content were excluded. Finally, twenty poems were considered for content analysis. The final number of poems analyzed was decided based on saturation of ideas. Nonetheless, minimum representation was given for districts, schools, grades, and gender to maximize data triangulation.

Table 1: Sampling distribution of the selected poems, schools in rural villages of Jimma zone, Oromia 2020.

Districts	Villages where the study schools are located (number of poems)				Sample per district
Shebe-Sembo	M/sedecha (1)	Y/dogena (1)	Mirgano (1)-M	Kishe (1)-M	4
Limmu-Kosa	Ambuye (1)	Gumar (1)-M	D/Gebana (1)	C/Ifeta (1)-M	4
Gera	K/Kindibit (1)-M	Sedi (1)-M	G/Challa (1)	Dusta (1)	4
Nono Benja	Illu (1)-M	Ebicha (1)-M	Amido (1)	Kolatie (1)	4
Botor-Tolay	B/Adare (1)	L/Botor (1)	B/Barite (1)-M	K/Boso (1)-M	4
*Grades	grade 5 (5)	Grade 6 (5)	Grade 7 (5)	Grade 8 (5)	20

(poems)					
*Sex (poems)	F(3), M(2)	F(2), M(3)	F(3), M(2)	F(2), M(3)	F(10),M(10)

*Equal poems were allocated to the grades and sex of poetic students. F=Female, M=Male

4.4 Data sources and collection methods

Five individuals (three masters of public health students and two graduated bachelors) were employed to collect the poems from schools in each district. They received training about the study and criteria of sampling, and selection of poems. Data collectors approached the sites, reviewed documentations, and selected information rich poems.

4.5 Data analysis

First the selected poems were converted to soft copies and saved in word document. Texts with plain and straight forward meaning were translated and coded in English language. Texts with figurative languages were carefully interpreted as equivalent meanings based on definitions of key types of figurative expression. The interpretations were audited by language and literature experts for accuracy. The data analyses were managed using Atlas.ti 7.1.4 software to assist in organizing, managing, coding text, editing, and category manipulation of data in a more efficient manner. Coding was carried out by reading and re-reading the compiled poems to achieve immersion and obtain a sense the whole. Before actual coding began, the poems were independently read by the investigator and other researcher assistant and code book was developed. The code structure later evolved as the actual coding progressed by the lead coder. Then, the lead coder analyzed the whole poems using established structure. The lead coder repeated the coding system after the first code book was developed.

As analysis unfolds, potential categories of messages in the poems were developed by clustering codes based on how different codes were related and linked. Themes of messages were developed by clustering the categories.

Literature types were analyzed according to their respective definitions. Finally, results were presented using major theme, categories, and specific contents supported by quotations. Moreover, counts of contents were tabulated to display frequencies their occurrence across the poems.

4.6 Trustworthiness

The rigors of qualitative studies are kept in four main ways: credibility, dependability, transferability, and confirmability. The credibility of this study was ensured by involving in research assistant in whole process of research to reduce the bias of a single researcher. He was researcher's colleague and MPH student. Tick descriptions which were provided to themes and categories of message contents, and supportive quotations add values to the credibility of the contexts of interpretations. Daily interactions among each other to confirm interpretations and coding decisions including the development of categories process were done (Peer debriefing).

Consequently, as much as possible, the investigator reported actual meanings of contents in the poems with minimal interpretation bias. To assure this, subjective neutrality and bracketing of ourselves not to intentionally assign expertise meanings other than interpretations transpiring during the coding process were kept.

Purposive sampling and diversity of districts, schools, grades, and gender represented in the selected poems can increase the transferability of the findings. Furthermore, detailed chronology of research activities and processes, and analysis, emerging themes, categories or quotations and adequacy of the findings in revealing malaria message contents located in students' poems were audited and confirmed by advisors, colleagues and examined by other person who has experience on conducting qualitative research to assure dependability and conformability audit.

4.7 Ethical considerations

This study was approved by Jimma University institutional review board of institute of health. Support letters were collected to approach the districts educational offices and schools. After converting the poems into softcopies, the hard copies were sent back to the schools for appropriate documentation. Since the time is the emergence of COVID19, we use mask and sanitizer during data collection time.

4.8 Plan for dissemination of findings

The finding of the study will be disseminated by hard and soft copy to Jimma university post graduate research directorate, and department of health, behavior, and society. More importantly, it will be published on reputable scientific journal. Moreover, the findings will be presented on local and international conferences or seminars.

5 Chapter Five: Results

5.1 Profiles poetic students and poems

In this study, twenty malaria poems were analyzed to understand the conveyed messages. The ages of students who developed the poems ranged from 12 to 17 years old (mean age, 14.3 years). Females and males each contributed ten poems. The students were attending schools in grades 5-8. All the poems were written in the Afaan Oromo language. The poems were disseminated on school mini-media, school parent days, school opening and closing occasions, community gatherings, and other events organized by education and health offices. From twenty poems, 15 of them have titles which were redundant. Those were poem about ITN, diseases of malaria and about malaria.

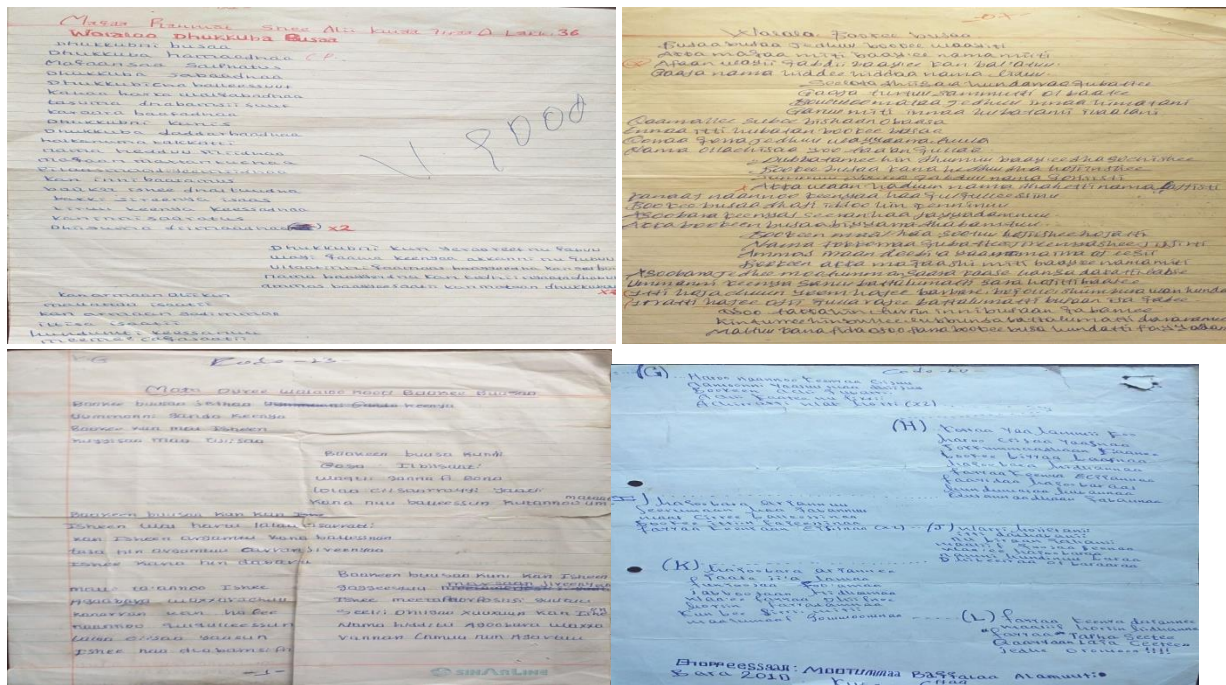


Fig.1 presents photos of selected poems.

5.2 Message contents of malaria poems

A total of 602 specific contents generated from poems were put into twenty one categories that were lined-up along five themes about malaria prevention and control. These message contents were: knowledge about malaria and its prevention; perceptions of threat from malaria; effectiveness of preventive measures; misconceptions, beliefs and malpractices; and manifest calls to adopt malaria control behaviors and social changes. Moreover, the central themes of

message contents were mainly expressed by metaphoric models and personified. Details narrated as below.

5.2.1 Thematic message 1: Knowledge about malaria and its prevention methods

Knowledge about malaria and its prevention methods was one of the profound contents conveyed by poems developed by students in primary schools. The main poetic message contents about knowledge of malaria include causes and modes of transmissions, mosquito breeding and biting behaviors, sign and symptoms, and ways of prevention, treatment and control of malaria. From the total explanation of poems about (n=216=36%) was regarding knowledge about malaria and its prevention methods. Specifications were presented below.

Causations and mode of transmission of malaria: The poems profoundly stressed on the cause of malaria. From the total contents described in the poems 51(8.5%) were regarding causation and mode of transmission of malaria. The poetic messages specified that malaria is caused by a parasite plasmodium that is transmitted through a bite of female mosquito by the name anopheles that feeds on human bloods. In fact, the poems also conveyed a message content that the bite by anopheles mosquitoes will cause malaria only when previous bite was made with someone who has the parasite plasmodium in their blood stream.

For example, one grade 5 female student from Botor-Tolay district indicated in her:

*“...All mosquitoes do not cause the disease malaria
It is caused by female mosquito that feeds on red blood cells
It is called as anopheles mosquito
While the parasite is known as plasmodium...”*

Another grade 5 male student of 13 from Gera district wrote:

*“...Malaria is transmitted by female anopheles mosquito
The causing parasite is called plasmodium.
The mosquito transmits the diseases to another person
By first sucking blood which contains plasmodium parasite
It further transmits the diseases to other people.”*

Anopheles mosquitoes acts of biting and causing diseases was personified and assumed characters of people who do evil things while looking good in wiles (e.g.: some people attack others while laughing at them) in their act of biting, feeding, and transmitting malaria.

A grade 6 male student from *Botor-Tolay* wrote:

*“...This mosquito has a lot of threatening activities
It has sharp mouth to feed on human blood.*

*It moves from person to person looking a normal man.
It hurts a lot though it looks harmless when it comes to you.”*

The poems emphasized female anopheles mosquitoes are attracted to human for reproductive necessity, and thus recommended the use of nets as a barrier to its bite is necessary. Altogether, the poems noted that mosquito was likening with flies and a single mosquito can reach many people within a day or entire community within short period of time.

“When you see (anopheles mosquito), it seems like flies.

Anopheles mosquito bites a lot of people in one night

Not the bites alone, it transmits the diseases.” (16 years old, grade 7, male student in Nono Benja district)

By this content, it seems the students were conveying latent meanings that barriers to mosquito bite should be uninterruptedly used at all times irrespective of low or reducing risk of malaria infection.

Mosquito biting behavior: Interestingly, the students’ also 10 (1.7%) times conveyed the biting behavior of the mosquitoes i.e. biting is mainly performed at night times, biting for sake of sucking blood to get elements that is required for their reproduction.

For example, one 8th grader female student from Gera district said the following in local language

*“...Afaan wayii qabdi baayyee kan bal’atuu
Gaafa nama hiddee hidda namaa lixuu
Kan nama cininitus wal hormaataafi dha
Yeroon inni nama cininuus sa’ati galgalaa dha...”* This literally means that the mosquito has a very sharp mouth. When it bites that sharp edge directly enters the person’s bloodstream. The reason of the bite mainly is for the sake of reproduction. And the biting time is often at the evening and night.

Biting of mosquitos was personified as a person who didn’t fear the creators and have poisons. In order to finish and sorrow the community, who works hardly.

Another grade 6 male of 15 from Gera expressed:

*“Biting is caused by female mosquito.
It carried poison and attacked the community
It doesn’t fear God, while harming people
It works very hard to replicate itself”*

Mosquito breeding behavior: The students' poetic messages 13(2.2%) times specified that the malaria causing mosquitoes breeding sites include stagnant water, broken materials that hold water, grass, and swampy area.

For example, a grade 5 female student of 14 from Botor-Tolay district said:

*“...the mosquito breeds in broken materials that hold water,
Multiply in swampy and abundant in the grass
Often proliferate during winter, but also in summer
It breeds on accumulated and stagnant water
And lays its eggs, 50-70 at one time
Completes its life cycle of metamorphosis
Then there will be plenty of them all over the world...”*

Signs and symptoms: In their poems the students 66(11%) times conveyed messages about distinguishable signs of malaria. The specifications to the signs and symptoms ranged from fever, headache, chills, feeling cold, weakness, joint pain, relapse, vomiting, and etc. For example, a grade 8 male student of 16 from Botor-Tolay said the following:

*“...These are the symptoms of malaria:
It warms the body and causes headache,
Makes you to vomit and hate food to eat,
It weakens the body, though you may get better,
It is on and off as it comes again and again,
It is worsening in infants and pregnant women
Causing to feel cold it shakes the body,
Finally feel fatigue and lose your consciousness...”*

Across the poems, distinguishable signs and symptoms of malaria were expressed by similes and metaphors. For example, fever was expressed like boiling water, sunny hot weather in summer times, and chills in terms of dancing.

A grade 5 student from Limmu-Kosa wrote that:

“It makes me fevered like that of a strong sunny season

It makes me to shivers like that of a heavy rainy season.”

Dhagna koo na gubaa akka aduu boonaa

Naan na rommissisaa Akka qorra roobaa

And also a, 15 years old, grade 6 male, student, in Botor-Tolay district wrote that:

“It (malaria) causes to feel breaking of the body,

By burning the persons, it causes to drink much water

They said, feeling colds, feeling clods by dressing more and more clothes,

If they are naked, it will cause shaking /shivering of the persons.

And also he complains by speaking that:

People caught me, I will compete in dance.”

Ways of prevention and control: the students profoundly 59(9.8%) times presented in their poems the knowledge about the methods of prevention, treatment, and control of malaria. They mentioned that hanging ITN, spraying anti-malarial chemicals in the home (IRS), and cleaning environments as major means of preventing mosquitoes and malaria.

“For this (malaria) diseases, it has many ways of prevention methods, cleaning effectively/correctly breeding site of mosquito, don’t left the toilet open, avoiding broken materials that hold water, disposing and draining ponds that holds water, removing dead waste from the environment, ... Hanging bed ne. If there is shortage of bed net, giving priority to sleep under bed net for pregnant women and under five children because they are easily attacked and have weak body Spraying chemicals in the house.” (17 years old, grade 8, male, student in Nono Benja district).

The students profoundly 59(9.8%) times presented in their poems the knowledge about the methods of prevention, treatment, and control of malaria. ITN, IRS, and cleaning environments were the mainly presented preventive methods. In a local language, a grade 7 male student from Nono-Benja wrote that:

*“...Karaan ittisa dhibee kanaa
Karaa heeddu danuusatu jira
Bakka hormaata bookee busaa sirritti qulqullessu
Mana fincaani qadaadu, qodaa cabaa bishaan kusuu gatuun ballessu
Boolla bishaan kuusan keessa yaasuun gogsuu
Raqaawwan xuraawaa naannoo irraa fageessu
Saaphana siree fannisuu
Yoo haanqinni saaphanaa jiraate dubarti ulfaaf dursa laachu
Daa'imman umuri shanii Gadiif fannisuu
Faayidaa biraaaf akka hin oolle ummata barsiisuu
Farra bookee busaa manatti biifsisuu.”* In this stanza, the student indicated cleaning the surrounding, sleeping under ITN (including giving priority to pregnant women and under-five year old children when there is deficit), and IRS ways of preventing malaria disease.

The students also indicated malaria is best treated at health facility including community-based health posts by following drugs as prescribed by health workers. For instance, a grade 5 male student from Gera wrote:

*“...When we learn that the symptoms suggest malaria
We need to go to health facility within one day
Understand and correctly practice the advice of health providers
Soon will manage it and will be free from the diseases...”*

ITN Care: In the poems messages 17(2.8%) times were indicated about ITN care. They mentioned ITN needs regular washing, dry under shadow, stitched when torn, and never used for any other purposes. A grade 8 male student of 17 from Nono-Benja district said:

*“...If bed net becomes dirty, wash and dry it under shade.
If it becomes torn, repair or mend it.
When it gets 6 O'clock, suspend it carefully
Use it wisely and do not make it for other purpose...”*

5.2.2 Thematic message 2: Misconceptions, beliefs, and malpractices presiding in community

In their poems the students 26 (4.3%) times presented some misconceptions and beliefs presiding in the community and that should be improved pertaining to the nature, causes, and prevention of malaria. Perhaps, these could be raised in reference to the knowledge contents mentioned earlier.

Misconceptions about causes: Regarding causes, 3(0.5%) the students revealed it is believed in their community that eating sugarcane, dirty foods, hungry, and cold weather are some of misperceived causes of malaria. Literally one stanza from a poem developed by a 7th grade female student of 15 from Botor-Tolay wrote:

*“...People talk different things about the cause of malaria
The cause of malaria is not what you think:
It is not lack/shortage of food,
It is not sleeping outdoors at day time.
If you ask me what is the right cause?
I will tell you there is only one, and one right cause
The transmitting mosquito named as anopheles
While the bacteria are called plasmodium...”*

Preventive and treatment malpractices: The poems picked that people shared some unhealthy norms regarding preventive/treatment of malaria: they tend to ignore seeking treatment early when signs of malaria are present, use previously saved drugs, share the drugs to each other, and

using ITNs as fastening rope, sacks, etc. Regarding treatment related malpractices, one grade 6 male from Gera stated that:

*“Qoricha waliif hiruun haala maaf nu taati?
Qqarshii keenya baasuun fayyuudhaafi miti?
Qooricha fiudhatani nama biraaf laachuutu mul’ata
Mana yaalaa deemnaan qoricha ni argannaa
Qoricha argannes baasne gatuu miti
Sirnaan fayyadamaa akka dawaa ta’utti.”* This one stanza literally is asking people about why they make habit of saving or sharing or interrupting drugs and do not seek care, and which finally advised appropriate use of drugs.

And also another a, 12 years old, grade 5, female student in shebe sembo district wrote that:

*“..If we have finished the drugs, what it (malaria) does,
Aha-ha, if the owner of the cattle hit the horn of the cattle,
Neighbor will hit (destruct) the eye of the cattle.”* Said the past Oromo

Regarding misuse of ITNs, a grade 6 male student of 16 from Botor-Tolay wrote in a local language:

*“Agoobara jedhe motummaan gaaraa kaasee hanga dakatti raabse
Ummanni keenya garuu battalummatti gara hojitti baase
Itti hojjechuun yoom hafe barbarree,boqollo,shumbura waan hunda irratti afe
Agobara argannee gaafa ji’a lamaa
Funyooosaa fo’ama jabbootaan hidhamaa
Waa’ee fayyaa dhifnee horiin fayyadamna
Kun mee sirri miti maaluumaaf gowwomna
Fayyaa keeyna dagannee maaliif horiin hidhanne?”* These lines explicitly talked about government’s commitment of mass distribution of ITN versus people’s misuse as rope and sacks. It also indicated that is foolishness to misuse ITN that is intended for people’s health. Finally urged people for how long they would continue to be reluctant of their health while using ITN for unintended purposes.

5.2.3 Thematic message 3: Threat perceptions from malaria and risk conditions

In the context of this study risk condition and threat perceptions from malaria refers to contents that were included in the poems regarding risk conditions, perception of risk, and severity and also it explained 123(20.4%) times in the poems of students. Details narrated below

Perceived risk or vulnerability: Along the poems students were initiating the community to feel the risk of infection by malaria or its serious form. It descried in the poems 7(1.1%) times. It

seems that in the community people started ignoring the risk of attack by malaria. To illustrate this, 5th grader male student from Limmu-Kosa stated:

*“...Malaria attacks all persons:
Without permission and difference in age
Children and aged people
Everyone is potentially affected by it
It doesn't fear the fatty ones
And never undermine the thin
Everyone should keep...”*

And also another a, 12, years old, grade 5, female student in Shebe-Sembo district wrote that:

*“If we expose ourselves to the diseases, who will fight us?
We were exposed to the diseases (malaria) while learning the science.
We know the solution, but were burned by the diseases why do we forget the life,
Which is given by the creators to protect from the diseases?
A thief will enter the house, through a door that he/she has opened.”*

In the meantime, the poems warned the community to actively watch after their health from risk of potential sudden attacks by malaria and not ignoring seeking care anytime they have symptoms. A female student in grade 5 from Botor-Tolay mentioned:

*“...Dhukkubichaan yoo qabamne
Mana marfee deemu yoo baannee
Sa'ati 24 carrraan nuuf laatame
Kana hunda goonaan carraan
Fayyuu keenya yeroo hidhoo keessatti
Kana itti amanaa hundumti keessani”*. The lines urged the community to feel at risk, check their health regularly, and believe in seeking-care within 24-hours of symptoms onset.

The students indicated pregnant women and under-five children are at high risk of experiencing worsening form of malaria and needing priority for sleeping under ITN. A grade 6 female student, Nono-Benja said:

*“...It's a message of trust, if we are in trouble
Giving priority for infants and pregnant is mandatory
We don't mean malaria doesn't infect others
But it mainly hurts/affects them...
To save ourselves from malaria disease*

*We sleep under the bed net, especially the children and pregnant
They are more likely to get malaria;
This is because their bodies are weak and vulnerable.”*

Risk conditions: The students 15(2.5%) times mentioned the presence of wastes, grasses, flat leaves of plants, swampy areas, stagnant waters, and broken utensils that are favorable for breeding of mosquitoes and also increase risk conditions for malaria. So long as people live in such environment, they are at risk of malaria.

*“...There are accumulated waters in our surrounding
Where the mosquitoes breed and multiply the disease.
They come to bite us and give us the disease.
So long as people don't dry accumulated water in our area.” (Grade 5 male,
Limmu-Kosa)*

*“...For the cause that we don't clean our environment
For reason we don't manage to safely dispose dirty water
Mosquito breeds there, and transmits the disease” (grade 8 male student, Shebe-Sombo).*

Perceived severity: The poems 101(16.8%) times memorized several stories about seriousness of malaria that happened in community before the last few years. Death stories causes by malaria and its effect on farming activities that mainly happened immediately before and after farming seasons were the main examples of explanations given to seriousness of malaria. Illustrative quotation taken from 8th grader male student from Gera stated in local language:

*“...Haaxxummaa busaa mee hubadhaa
Lola baayyee ulfaataa dha
Otuma hin beekin hubde nama fixxi
Utuma hin yaadiin lubbu namaa baasti
Maalii kan busaati baayyee jabaataa dha
Malli busaa baayyee ulfaataa dha
Dhaloota fixate abboota hin jenne
Hundarraa qubatte dhaloota hunda fixxee
Lafa mancaafte (read 2X) yommuu ilaalan
Ariifachisuun lubbu namaa baasaa
Jireenya hanqisaa lafa irraa ballessaa (read 2X)
Duri hunda ajjeese
Omishaa fi omishtumma gad xiqqeesse
Lammi kan koo beelatti hanbise.”* This portion literary explained that malaria has

taken the lives of many people over the past few years, caused sudden deaths, almost killed someone from every household, and affected farming and contributed to hunger.

War and deaths were symbolic representations used to indicate the need to engage in the fight of malaria and its prognosis if the fight is handled reluctantly. A grade 7 student from Nono-Benja said,

*“...It is not as some people think malaria is mild
It kills if you don't go to health facility
Let's get up for the fight don't be lost in the battle
Oh, people of Jimma rise for the solution
Defeat the war against malaria.
Why are we beaten while we can win it?”*

Moreover, the death itself was expressed as “being consumed or eaten”, life taken by malaria, and pass the life, i.e. to imply that deaths from malaria are categorized as premature and preventable, and should be modified through social and behavior changes.

The death itself was expressed as “being consumed or eaten” i.e. to imply that deaths from malaria are premature and preventable, and should be modified through social and behavior changes. An 8th grader female student from Gera expressed,

*“..Malaria wants to take the lives of many people
Just like yesterday when it consumed the lives of my people...”*

5.2.4 Thematic message 4: Perceived effectiveness of preventive measures

Introductory knowledge contents about key malaria control measures were reported previously. The current theme 76(12.6%) times elaborated how the poems presented the effectiveness of the measures in putting malaria under the control of the community.

Effectiveness of insecticide treated nets (ITNs): The students 29(8.1%) times stressed in their poems that active use of ITN (any net) can safeguard a family and community from risk of malaria. ITN can trap malaria causing mosquitoes. ITN was presented as a frontline preventive material in the fights against malaria. An 8th grader male student from Botor-Tolay said:

*“...Bed net is a treatment
It has a chemical which burns malaria.
By it you can avoid mosquito's contact with your bloodstream.
You can protect yourself from malaria by sleeping under net.”*

ITN can trap malaria causing mosquitoes. ITN was presented primarily precious preventive material in the fights against malaria. In the poems ITN was represented by a trap i.e. a mental picture the students used to draw the attention of their audience; rural people use ‘trap’ for hunting animals e.g.: pigs, monkeys, etc. that damage their farming. This indicated the need to actively use ITN to trap mosquitoes. As when the poorly maintained traps loss to catch animals

that damage farming, improper use of ITN make us loss the game over malaria. The mosquito is sketched as life stealing thief. A grade 6 male student from Botor-Tolay said,

*“I will tie a trap and spend the night under it,
Where do you get me? Why do you try to bite me?
If you hang the trap, mosquito don't bite you anymore
So, my people don't joke regarding bed net,
Utilize it properly, don't pierce and discard it
Hanging the trap on our bed, we will capture and trouble it
Finally it will cry anxiously and left in there...”*

Effectiveness Indoor residual spray (IRS): It was 4(0.7%) times sketched an outreach to attack mosquitoes that cause malaria. It was believed to effectively kill mosquitoes while resting indoor, and in peak breeding seasons.

*“..It is possible to eliminate malaria mosquitoes
By getting antimalarial chemical spray in the home.” (Grade 6 male student,
Botor-Tolay).*

Effectiveness of cleaning the surrounding environment: regular cleaning of compounds and surrounding environments was perceived as effective means of reducing risk conditions and chances of mosquito breeding. It was 12 (2.0%) times mentioned in the poems. An 8th grader from Limmu-Kossa stated in a local language:

*“...Naannoo jireenya keenya saatitti haa ilaalamuu
Lola cisaa yaafne yeroo yeroon ilaalle haa qulqullefamu
Naannoo jireenya keenya yeroo yeroon ilaalla
Naannoo jireenya koo irraa si fageessa
Naannoo qulqulessine of irraa eegannaa.”* This literally means that regular cleaning of the surrounding is effective way of protecting their locality from mosquito and malaria. In fact, the poet committed oneself and other to engage on cleaning and get protected.

Effectiveness of seeking treatment at health facility: the poems 5(0.8%) times were promoted the nearest health facility to effectively test, ruling-out, and manage malaria. Health posts were promoted as having malaria testing kits and drugs. A grade 6 male of 15 from Gera said the following:

*“...If you are infected with malaria,
Go to the nearest health facility
Where you can get a treatment
If we recognize we have malaria symptoms*

*We should not die by sleeping in bed
Immediately get lifesaving treatment, which is our duty.”*

Effectiveness of anti-malarial drugs: The poems are contented 6(1.0%) times messages about malaria drugs. Relapse of malaria disease was presented as a result of failing to complete taking anti-malaria drugs. Professional prescriptions are the only best means of getting proper and quality drugs.

A grade 5 female student from Botor-Tolay stated:

*“If you observe anyone with symptoms of malaria
Take the person to nearby health facility
Why are you eaten by malaria while knowing this fact?
Completing the drugs given by the health provider is must
Leaving the drugs unfinished is our fault
The drugs completely taken, then malaria disappears from our body.”*

A grade 8 male student of 17 from Nono-Benja wrote:

*“...When we see symptoms of malaria,
Visiting health facility within 24 hours
Following the health professional’s advice correctly
Taking the drugs as prescribed by the health professional
Refraining ourselves from giving the drugs to someone else,
We can be saved from malaria.”*

5.2.5 Thematic message 5: Calls to adopt malaria control practices, and social and behavior changes

Closely linked knowledge contents mentioned earlier, summative content analyses were conducted to describe the latent specifications/meanings/contexts underlying social and behavior change calls manifested across the poems. Accordingly, there were 161(26.8%) messages that explicitly called the exposed community and any other listeners/readers to adapt the practice of cleaning their surrounding environment, ITNs use, caring IRS, seeking treatment when symptoms are present and appropriate drug-use. Interestingly, there were contents that called to social change and collective engagement on preventing and eliminating malaria from their community and beyond. The latent meanings of these behavior and social changes were specified below.

Cleaning the surrounding environment: there were 47 (7.0%) contents across the poems. The central messages which left to community regarding malaria via the act of cleaning environment were multiple and fundamental. In the first place, the poems conveyed to community to have an

internal locus of controlling malaria in that they can manage the breeding and attack by mosquitoes.

A student of grade 6 from Botor-Tolay said:

*“... We do not give place to malaria
Let's clean up our environment
Let's remove mosquito's breeding site
So that put our enemy under the control.”*

Secondly, to achieve the control over mosquitoes and malaria, the community should manage small water bodies/swampy or any surrounding conditions suitable for breeding including broken utensils, leaves of some plants like insect, and other wastes. Accordingly, draining waters, filling swampy areas, cutting leaves, and burning of wastes were the suggested actions. An 8th grader from Limmu-Kosa indicated:

*“..Qodaa caccabelle boollatti awwaalamaa
Balfi garaagaraas diidatti gubamaa
Bishaan ciises yaa'ee gadhiifamaa
Lafa margaa kessatti baay'inaan argamaa
Lafti margaalle qe'erraa haamamaa
Naannoo jireenya keenyaa yero yeroon ilaalla.”* These lines appeal the community to dispose broken materials in pit, burn solid wastes, cut grasses, release any accumulated and irrelevant waters, and make these entire things regularly.

Taking precautionary measures for IRS: In support of efforts to kill mosquitoes and manage malaria, there were 18(3.0%) messages in the poems that commanded the community to adapt regarding anti-malarial chemicals (IRS). One is precautionary measures that prevent unintended effects (allergy, suffocations) of IRS by closing the house for few minutes after spray and properly ventilating for hours. A male student of grade 6 from Shebe-Sombo said:

*“...Anti-malarial chemical spray is the third method
Let's get out of home while spraying.
We will not get back home up until two hours
Never open the doors within 15 minutes of spray...”*

Another student of grade 8 from Nono-Benja stressed,

*“..When anti-mosquito chemical is sprayed,
Refrain yourself from painting and posting
Never paint and mold the wall with mud*

*Follow this command up until 6 months
The spray has anti-mosquito chemicals.
The sprayed drugs works up to 6 months,
You know that no painting or posting the walls
That is impossible, strictly forbidden.”*

Second, enhance the effectiveness of IRS by refraining from painting and posting on the walls till 6 month

Another student of grade 8 from Nono-Benja stressed,
*“..When anti-mosquito chemical is sprayed,
Refrain yourself from painting and posting
Never paint and mold the wall with mud
Follow this command up until 6 months
The spray has anti-mosquito chemicals.
The sprayed drugs works up to 6 months,
You know that no painting or posting the walls
That is impossible, strictly forbidden.”.*

Utilization of ITN: There were 23 (3.8%) latent meanings conveyed by the poems while calling the exposed community to utilize ITN. For that community where the students lived, ITN was defined as an important weapon to fight malaria. First, they advised ITN use should become a normal part of daily actions: adapted by everybody, every night, and at all seasons (irrespective of pick mosquito breeding times, low prevalence of malaria), and never missed when owned. At the time of limits, the poems encouraged the practice of giving priority to pregnant women and children. Illustration captured by a grade 5 student from Limmu-Kosa said,

*“...Let’s use bed net at every night
Tie it carefully up when we are awake.
Why do we damage it? Rather we care for it
We use it as it keeps our health
We eliminate malaria by using it.
We use it always and stay healthy
When not enough for all, play your obligation
Give priority for infants and pregnant women.”*

Second: in the poems, ITN was presented as precious material to care for through regular washing; drying under the shade, and stitching when torn; never misused for unintended purposes like rope, sucks, and wraps.

In the poems ITN was also presented as precious material to care for through regular washing, drying under the shade, stitching when torn, and never used for unintended purposes like rope, sacks, and wraps. Interestingly, the students also depicted their educational and supportive roles in the act of caring for ITN. A grade 7 male student from Nono-Benja stated,

*“...Get up, arise, the educated children
 It is your turn to teach your community
 Tell them to sleep under the bed net
 Not just sleeping under it, they should also care for it
 We should observe the nets and follow it every day
 We search it out and stitch whenever we see torn
 Never forget to tie-up and suspend after using it.
 It must also wash at every three-month
 We use soap for wash and shade for drying.”*

Seeking treatment and drug-use for malaria: By their poetic skills the students were 15 (2.5%) encouraged their audiences to seek treatment when distinguishable signs are present. The signs and symptoms were presented previously as knowledge content. The dominantly mentioned were fever, feeling cold, and headache. Two main messages were inherent in the poems regarding treatment. Malaria should be treated at health facility, as other local practices may not work. The treatment should be made early i.e. within 24 hours of onset. Following seeking of treatment is appropriate use of drugs. The poems conveyed the need to adhere to professionals’ prescriptions at any expense by completing the drugs according to the scheduled time of taking. There were some practices that seemed to be practiced regarding drugs that the poems called the community to stop doing. For example, interrupting the drugs following relief, saving for another time of illness, sharing them to others, and entirely discarding the drugs were the main ones.

A grade 5 female student from Shebe-Sombo said in a local language,

*“...Yoo fuudhantee fixne maaluma nuu gooti
 Abbaan ofitti dhukkuba taanaan dhukkubni maal gooti
 Siluma abbaan ofi dhukkubaaf dawaa ofiti
 Qoricha mana yaalaa nama keennameeni
 Fayyadamani osoo hin hanbisiin
 Hidda ishee ni kuuttu fayyaa ofi eegnani.”* This stanza literally indicated that it is

possible to total control malaria by taking care of ourselves, particularly by adhering to drugs as prescribed by health workers. One key note the poet underscored was that it not a disease that matters rather it is reluctance people have in observing the necessary healthcare.

Social changes towards malaria elimination: There were 63(10.5%) interesting messages in the poems that called the entire community and stakeholders to prevent and eliminate malaria through collective efforts and engagement. There were several clues that inherently defined the social change towards malaria elimination in terms of principles. The following were some of the principles: the need to have sense of ownership of the task of preventing and eliminating malaria

(e.g.: cleaning environment and management of mosquitoes), feeling responsibility (e.g.: considering oneself as having role in the task), social cohesion (e.g.: building networks and keep unity to accomplish pertinent practices mentioned earlier), and collective efficacy and engagement (e.g.: acting together and involvement of all segments). A grade 8 male of 17 from Gera stated the following,

*“We will eliminate malaria by working together and keeping unity
We will educate our community and take care of our acquaintances
Parents and children all contribute for elimination of malaria.
We will start working elimination as of this year
So that it won’t kill us again like any time ever before
We will not pass malaria unto the next generation
We will eliminate malaria by working hand in hand
Let teachers eliminate malaria so that the community develops
Let you teach and consult our farmers
Let’s do what we can do and work with health providers
Accept their advice and observe what they say.
Let’s get up in groups and individuals to eliminate it from our country.”*

Another grade 5 student from Gera district wrote:

*“...Let’s get up and make a campaign
To remove malaria from the country
Rise up, especially the educated students
Let’s start teaching from the uneducated student
Let’s go to our people to eliminate malaria
We drain stagnant waters by working together
Rise and stop it by standing in unity
Be strong everyone, and protect yourself”*

Another grade 8 male student from Bator-Tolay wrote:

*“... Rise up to eliminate malaria
Strengthen yourself and fasten your belt
Remove the ways of spread of the disease
Be united as working alone will make you tired
As old saying goes bonded strings will tie an elephant (read 2X)”*

6 CHAPTER SIX: DISCUSSION

The current qualitative study explored the message contents conveyed in malaria poems generated by students in primary schools targeted by one of school-based malaria SBCC project in Jimma zone, Oromia-the largest state in Ethiopia. The conventional and summative content analysis revealed five central themes of message contents. Knowledge about malaria and its prevention, risk and threat, Misconceptions and malpractices, effectiveness of preventive methods, and calls to adaptations of practices were the dominant ones. Metaphoric expressions and personifications were the commonest forms of literatures used in the poems.

Causations and mode of transmission of malaria was one of the main contents raised across the poems. Knowledge of correct causes of malaria i.e. the parasite plasmodium and transmitted through the bite of female anopheles mosquitoes was the commonly introduced content of the poems. Fever, chills, and headache were the commonest signs mentioned by the poems. ITNs and environmental cleaning were the main message contents transmitted towards increased knowledge of preventive actions. Myriads of malaria studies and behavior change oriented programs emphasized similar knowledge contents(42,43,45). Moreover, it is important to know the correct causation and prevention of malaria to enhance adaption of preventive and treatment actions (46,47).

The poems picked up misconceptions, beliefs, and malpractices presiding in the community. The dominant misconceptions were related to causes of malaria. Some of the lists include food shortages, hungry, dirty foods, foods items like sugarcane or maize, etc. Numerous studies reported similar misconceptions about causes (48,49). There were malpractices in community regarding malaria mainly focused on preventive actions. These include miss use of ITN, and sharing and interruption of drugs, Similarly, pieces of studies revealed such acts are rampant in Africa (50–52).

Students in primary schools developed and transmitted messages that enhance community appraisals of the threats from malaria. Some studies in Ethiopia indicated the incidence and perception of risk to malaria are significantly falling (4,22,53,54). This implies that if the messages disseminated to the community, risk perception of the community might be increased. In spite of falling trend, the poems presented about the need to feel risk and severity of malaria. Particularly, this study revealed that severity of malaria was the most dominant content presented

across the poems accounting to 101 (16.8%) of the entire specific messages. Premature deaths and wars were some of the metaphors used to initiate the feeling of risk and engage on practices.

Perceived effectiveness of preventive measures was one of the content in this study which includes bed net, environmental modification, and spraying chemicals. Specifically effectiveness of sleeping under bed was mostly included. This implies that if the poems disseminated to the community, perception of the people about effectiveness of preventive measure might be increased. But in this study message of vulnerability of malaria was low, as a result if the messages distribute to the community, peoples may be slightly motivated to act. So, it is important to encourage the students to develop messages that increases perception of community members remains susceptible to malaria. According to EPPM model, people who feel that using preventive measures is easy and effective but feel little fear about risk of the diseases, message should be design that increase the perception that community members remain susceptible to the diseases (55–57).

Calls to adapt malaria preventive and control practices by community and social changes were one of the major contents of the poems. Cleaning surrounding environments to destroy mosquito breeding sites (draining stagnant water and swampy, removing broken materials, and cutting grasses and leaves of some plants) was a leading call. Use of chemicals i.e. IRS was mentioned in the poems with precautionary (remove household utensils, ventilate houses, no plastering or painting walls until six months of spray, etc.) measures. The third most common call was sleeping under ITN by everyone at every night and season. Global and national strategies specify habitat modifications, ITN, and IRS as core physical and chemical mosquito control mechanisms (3,5,10,42,43). Though they were not dominant ones, seeking treatment for malaria symptoms and use completing drugs prescribed by health professionals were convey by the poems. Likewise, ENMP indicates symptoms of malaria should be treated by appropriate drugs after confirmed testing, with 100% adherence to prescriptions within 24 hours of onset of fever (3,42).

Interestingly, beyond calls to individual or household behavior changes, the poems sketched social changes for malaria prevention and elimination. The students raised critical values like sense of ownership, feeling responsibility, social cohesions, and collective engagement to eliminate malaria. Similarly, health communication interventions emphasize on two forms (behavior and social) of change. The social changes are marked by indicators like community

participation, engagement of local leaderships and networks, social cohesions, sense of ownership, sharing and feeling of responsibilities etc.(6,13,58)

Obviously, poems are known in artistic literature contents i.e. figurative speeches. There are numerous types of figurative languages to convey messages in any artistic communication: some of them are metaphors, similes, personifications, hyperbole, litotes, irony, paradox, synecdoche, pun, etc.(26,27,31). Two examples of metaphor (about ITN) and personification (about malaria mosquitoes) are used below. This is to explain how effectively messages can be conveyed in poems, by creating contexts and mental models or heuristics for learning or change. Metaphorically the poems represented ITN by traps that effectively catch harmful causative agents i.e. mosquitoes in this case. Such mental models could easily convince the public particularly in rural settings where traps are used to safeguard farming from animals that damage crops. Thus, audiences of the poems could visualize an active use of ITN as mechanism of putting mosquitoes in trap i.e. to prevent attack. Moreover, in the poems personification was allotted to mosquitoes. Mosquitoes put on characters of some evil doing people who attack while resembling friends in their wiles. This personification can easily elaborate that mosquitoes that lived in community, despised, and looked unto as safe can unexpectedly turn out to be harmful and killing. In doing so, the poems give warning to take care of malaria mosquitoes. It implies that the uses of poems would be advantageous for creating learning contexts by using local beliefs and mental models for conveying messages in convincing manner and figures of speeches including metaphoric expressions. So, it is important to utilize traditional means of communication (like poems) that keeps local contexts and conveys understandable messages that resonate to community in convincing manner. Evidences indicate that uses of local contexts and mental heuristics are effective ways of communicating perceptions, attitudes, and promoting practices(12,59–61).

Overall the poems generated by students in primary schools were rich in messages that also are promoted by a range of malaria prevention and behavior change programs. For example, most of the contents in the poems were targeted by RBM's SBCC indicators, and stated in malaria elimination framework and global technical strategy of 2016-30 (5,6,10,13,58). To mention some, knowledge, perceived susceptibility, severity, attitudes, self-efficacy, social norms, and practices related to ITN, IRS, environmental, and treatment are the dominant social and behavior

change indicators of these programs. This implies that involving primary schools and students would be an effective approach in malaria message development concerning knowledge, risk perceptions, attitude, and practices. Interestingly, a study indicated that there were behavior changes observed in settings where these poems were developed, particularly in knowledge, ITN usage, and precautions concerning IRS (22). Perhaps the poems had contribution for the changes. This implies that students in primary schools might be considerable sources of social and behavior change oriented malaria messages, particularly in resource-limited rural settings.

Strength and limitation of the study

To the best of the investigator's knowledge there was limited published works in Ethiopia. Therefore, findings were not well discussed with related literatures. Undeniably, primary school students cannot be like professional and experienced poets. Moreover, the content analysis presented in the current report emphasized denotative than hidden meanings. Nonetheless, there are still clues that the students' skills can be nurtured, utilized, and promoted.

7 Chapter Seven: Conclusion and recommendation

7.1 Conclusion

The poetic content analysis indicated that messages about severity of malaria distinguishable signs and symptoms, manifest calls to practice of malaria prevention and elimination, and effectiveness of ITN use were the commonest conveyed contents. This implies that involving primary schools and students would be an effective approach in developing malaria messages. Nonetheless, messages about vulnerability and seeking of treatment for fever were low. So, it is important to encourage the students to develop messages that increases perception of community members remains susceptible to malaria and to seek treatment for fever. Metaphoric expressions; war and death; and personification of mosquitoes as men doing evil in wiles were used in the poems to convey message about severity and ITN usage metaphorically represented as a trap to mosquitoes. It implies that the uses of poems would be advantageous for creating learning contexts by using local beliefs and mental models for conveying messages in convincing manner. So, it is important to utilize traditional means of communication (like poems) that keeps local contexts and conveys understandable messages that resonate to community in convincing manner.

7.2 Recommendation

To Jimma town health office, message developers and any organizations working in the area of malaria prevention and control might be important to follow the following recommendations.

- Messages focusing on vulnerability and seeking of treatment for fever should be designed.
- To utilize a primary school students in developing malaria messages
- To utilize traditional means of communication (like poems) that keeps local contexts and conveys understandable messages that resonate to community in convincing manner.

8 Chapter eight: References

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Annex

Annex I: Guiding questions for content analysis of messages of malaria poems produced and disseminated by primary school students

1. What are the key messages present across the malaria poems messages?
2. What are the key behaviors promoted by the malaria poems messages?
3. What types of figurative languages utilized in the poems messages?
4. What kinds of metaphors and similes are used to portray any aspect of malaria prevention and control in the malaria poems messages?
5. What are the manifest and latent meanings of messages present about key malaria preventive behaviors presented across the malaria poems messages?
6. What are the most commonly described contents in the poems.
7. What malaria causes of illness are portrayed and how do they constructed /framed in the selected poems?

Annex II: Code book structure

Table 3: Codebooks for Content analysis of message in the malaria poems developed by primary school students in Jimma Zone, Oromia Ethiopia, 2020

Codes	Definitions	Examples
Knowledge about malaria and its prevention	Description of information about malaria and its prevention measures in the poetic message of primary school students. It includes description of causes and modes of transmissions, mosquito breeding and biting behaviors, sign and symptoms, and ways of prevention, care of ITN, treatment and control of malaria.	<i>“The causes of malaria is plasmodium parasite and transmitted by female anopheles mosquito and there are ways of prevention of malaria like that of hanging bed net every day, spraying chemicals in the house and cleaning the environment “.</i>
Knowledge about sign and symptoms of malaria	Description of distinguishable signs and symptoms of malaria which ranged from feeling hot, headache, feeling cold, weakness, joint pain, relapse, vomiting, and etc.	<i>“These are the symptoms of malaria: it warms the body, causes headaches, makes you vomit and hates food, weakening the body, once you get better, it comes again and again, for infants and pregnant mothers by causing to feel cold it shakes the body, and it throws their head down.”</i>
Knowledge about ways of prevention and control	Contents that describe a means of preventing mosquito bites and malaria including sleeping under ITN, spraying house with IRS, disposing broken material that hold water, avoiding stagnant water,	<i>“For this (malaria) diseases, it has many ways of prevention methods: cleaning effectively/correctly breeding site of mosquito, don’t left the toilet open, avoiding broken materials that hold water, disposing</i>

	avoiding mosquito breeding site and keeping clean the environment	<i>and draining ponds that holds water, removing dead waste from the environment, ... hanging bed net by giving priority to sleep under bed net for pregnant women and under five children If there is shortage of bed net, because they are easily attacked and have weak body.... spraying chemicals in the house”.</i>
Knowledge about causation and mode of transmission of malaria	Contents that describe about how malaria diseases are happen /occurred. It includes that causation of malaria by plasmodium species and bite of anopheles mosquito when previous bite was made with someone who has the parasite plasmodium in their blood stream.	<i>“The way it (malaria) is transmitted is by female anopheles mosquito and the parasite is called plasmodium. It is transmit by sucking of one person’s blood which contains plasmodium parasite) to another person. Further it transmits the diseases for the peoples.”</i>
Knowledge about mosquito biting behavior	Description of contents about biting behavior of mosquito i.e. biting is mainly performed at night and morning time, feature of biting and feeding habits in by their poems messages.	<i>“Mosquito has a very wide mouth when it bites a person enters a person’s bloodstream and its bite is for the sake of reproduction and time of biting is during night and morning time.”</i>
Knowledge about mosquito breeding behavior	Contents that describe suitable breeding sites of mosquito like that of stagnant water, broken materials that hold water, grass, and swampy area in the students’ poetic messages.	<i>“It (mosquito) breeds on broken materials that hold water, stagnant water and grass (16, years old, grade 8, and male student in Limmu-Kosa district) And during winter and summer, it assembled and breeds on stagnant water and lays its eggs 50-70 at a time and completes its life cycle of metamorphosis. Then there will be plenty of them all over the world”.</i>
Knowledge about ITN care	Description of how ITN is cared in by their poems messages including washing of ITN with soap within 3 month and drying under shadow stitched when torn, and never used for any other purposes.	<i>“If ITN becomes dirty, wash with soap and dry it under shade and if it gets tear, repairing or mending it. And also bring up at 12 O’clock am LT...teach the people to not use for other purpose.”</i>
Misconception ,belief and malpractice in the community	Contents that describe presence of misconception, beliefs, and malpractice regarding malaria and its prevention and control methods, in by their poems’ messages and should be improved.	<i>“There are beliefs of boiling coffee as a treatment for malaria and using of previously saved drugs over the counter and using of bed net for tying cattle and laying grains in our community.”</i>
Misconception about causes	Description of contents in by their poems that is wrongly believed causes of malaria in their community like that of hungry, sleeping outdoors ,eating sugarcane, dirty foods, cold weather and etc. perceived as a causes of malaria.	<i>“Every person’s says where is the source (causes) of malaria... the diseases is not caused by lack/shortage of food, and sleeping outdoors”</i>
preventive and treatment malpractice	Contents that describe people believe in and follow local preventive/treatment modalities which need improvement. It	<i>“Why drug interruption becomes our behavior? Isn’t it true that we spend money to be saved? And also there is giving of</i>

	includes malpractices concerning treatments like using herbs, and previously saved drugs, buying drugs over the counter, sharing from each other and also using bed net for laying grains, tying cattle and toilet construction.	<i>previously used and saved drugs for other persons... also there is discarding of the drugs which got from health facility. Please utilize it appropriately in order to become a medicine (treatment)"</i>
Threat perception from malaria and risk condition	It refers to contents that describe risk of experiencing and severity or seriousness of malaria.it includes risk conditions, perception of risk, and severity.	<i>"Malaria affects and killed all my people in the past and caused to decreased Production and Productivity of the farm. Then it exposed to them for starvation."</i>
Perceived risk or vulnerability	Contents that describe perception of likelihood of experiencing malaria in by their poems messages which includes initiating the community to feel risk of infection by malaria or it serious form, and also indicating pregnant women and under-five children are at high risk of experiencing worsening forms of malaria due to their low immunity.	<i>"Malaria attacked all persons without permission and difference in age (children and aged persons)... every/all person are attacked or affected by malarial diseases it doesn't fear the fatty persons and undermine the thin/slim persons it affects all persons".</i>
Risk condition	Description of presence of risk condition that exposed to biting of mosquito and malaria in by their poems messages. It includes the presence of wastes, grasses, flat leaves of plants, swampy areas, stagnant waters, and broken utensils that are favorable for breeding of mosquitoes.	<i>"We stored water in the surface then it (mosquito) rests and stores the diseases on it. After that by biting it put the diseases on us. "Why do people stop pouring stagnant water in our area? Due to we didn't Clean our environment and disposing stagnant water .It breeds there then it bites us."</i>
Perceived severity	Contents that describe perception about seriousness of malaria that happened in community. It includes description of causing loss of human life, economical loss, damage or limit to a person's physical or mental abilities, and its effect on farming activities in by their poems messages.	<i>"Malaria is very heavy diseases by spreading the diseases bothered everyone. It kills and disabled the persons quickly without assuming or recognizing the presence of the diseases...and also it doesn't says father, mother, female and children it bans/destroy from the earth and cause to sorrow/cry every ones".</i>
Perceived effectiveness of preventive measure	Description of contents that describes ability of preventive measure in helping the community to keep from malaria. It includes perception of effectiveness of bed net, IRS, cleaning the environment, treatment and drugs.	<i>"Using bed net every night, cleaning environment and spraying chemicals in house are effectives in protecting bites of mosquito and malaria."</i>
Effectiveness of ITN	Description of perception about effectiveness of ITN in keeping bite of mosquito and malaria. It includes that active use of ITN can safeguard a family and community from risk of malaria and it can trap malaria causing mosquitoes. Considered as a preventive material in the fights against malaria.	<i>"You can protect yourself from malaria by sleeping under bed net ...I will suspend and sleep under bed net. Where you get me. Why do you bother to bite me? If you tauten bed net, it didn't get to bite for the second time".</i>
Effectiveness of IRS	Contents that describe perception about working of spraying IRS in house and on	<i>"It is possible to eliminate/prevent malaria disease, by spraying antimalarial chemical</i>

	water bodies in peak breeding seasons to kill mosquitoes that causes malaria in by their poems messages.	<i>in the home.”</i>
Effectiveness of cleaning the surrounding environment	Description of perception about regular cleaning of compounds and surrounding environments as effective means of reducing risk conditions and chances of mosquito breeding.	<i>By looking (cleaning) our environment hourly and destroying stored water in on time and by checking our villages’ sanitation regularly, we will far away the mosquito from our villages....We can prevent ourselves from malarial diseases, by keeping our environment clean”.</i>
Effectiveness of seeking at health facility	Contents that describe nearest health facility as effective ways of testing, ruling-out and managing malaria..	<i>“If you infected with malaria, by going to the nearest (local) health facility, you will get a treatment of malaria... If you see the symptoms of malaria, we should not die by sleeping in bed, but immediately by getting treatment saving life is a public duty”.</i>
Effectiveness of drugs	Description of contents that describe effectiveness of drugs in protecting deterring or avoiding of malaria. It includes that failing to complete anti-malaria drugs result in relapse, and professional prescriptions as the only best means of taking drugs.	<i>“If you look symptoms of malaria, take the persons to health facility, why do malaria eat us by knowing this (knowing of health facility as the best place of getting of treatment).Finishing a drugs which we were given by health provider is a must for us. It is our fault that leaving unfinished but if we finished the drugs, it becomes disappear from our body”</i>
Call to adopt malaria control practice and social and behavioral changes	Description of contents which explicitly called the exposed community and any other listeners/readers to adapt the practice of cleaning their surrounding environment, ITNs use, IRS, seeking treatment when symptoms are present and appropriate drug-use and social change and collective engagement on eliminating malaria from their community	<i>“We will eliminate malaria by working together and keeping unity. We will educate our community and take care of our acquaintances. Starting from father to son contribute for elimination of malaria. We’ll eliminate malaria from beginning this year. It did not kill us for the second time. We will not pass it on to the next generation. We will eliminate malaria by planning and working together or supporting each other (by connecting with hand by hand).”</i>
Clean the surrounding environment	Contents that describe performing of cleaning the environment to achieve the control over mosquito and malaria. It includes managing small water bodies/swampy or any surrounding conditions suitable for breeding including broken utensils, leaves of some plants like incent, and other wastes. Accordingly, draining waters, filing swampy areas, cutting leaves, and burning of wastes suggested as actions in the poem of students.	<i>“It (mosquito) breeds on broken materials that hold water, in stagnant water, and also in abundant in grass. So, if we get broken material, we will dig for it and buried in a pit (hole). For varies waste, it will be burned. Sleeping water will be avoided. Grass will be removed. And the environment will be checked for the sanitation regularly”</i>
Take precautionary measures for IRS	Contents of description that commanded the community to adapt IRS. It includes precautionary measures that prevent	<i>“Spraying anti-malarial spray is the third one (prevention methods).Let’s get out after spraying it. We will never enter in to home</i>

	unintended effects of IRS by closing house for few minutes after spray and properly ventilating for hours.	<i>up to two hour of spraying and we will not open the door up to 15 minutes.”</i>
Utilization of ITN	Description of contents that calling the exposed community to actively engaging in utilizing ITN every night, by giving priority to pregnant women and under five children. It includes calling of the community to use ITN as a normal part of daily action and adopt everybody to every night and at all seasons and at the time of limits to give priority for pregnant women and under five children never missed when they owned and caring of ITN by regular washing; drying under the shade, and stitching when torn.	<i>“We use bed net every night and also we will tie bed net and spend the night under it, where you get me? Why do you bother to bite me? After two month of owned bed net, we used for a rope, for tying calf; by forgetting our health we used it for cattle. These are not right way and why are we foolish. So, when we get the bed net we will use carefully in save. Why do we damage it? We will keep our health and eradicate malaria by using it. We'll tie the bed net and stay our healthy...if we are in trouble of bed net access, prioritizing infants and pregnant women are our obligation.”</i>
Seeking treatment and drug use for malaria	Contents that encouraging the audiences to seek treatment when distinguishable sign are present.it includes treating of malaria at health facility other local practices may not work and seeking treatment within 24 hours of onset Following seeking of treatment is appropriate use of drugs meaning practicing professionals' prescriptions at any expense by completing the drugs according to the scheduled time of taking.	<i>“What will it (malaria) do, if we take completely the drugs? If the person is a disease on his own. What to do malaria? First of all, the man is a treatment for his own diseases. So, a man who destroys his /her drugs will sorrow by downing his head... finishing the drugs which was given by health providers is a must for us. Leaving unfinished is our fault. If we take the drugs completely the diseases will disappear from our body.”</i>
Social change towards malaria elimination	Description of contents that calling the entire community and stakeholders to eliminate malaria through collective efforts and engagement. It includes practice of encouraging the need to have sense of ownership of the task of eliminating malaria (cleaning environment and management of mosquitoes), feeling responsibility (considering oneself as having role in the task), social cohesion (building networks and keep unity to accomplish pertinent practices mentioned earlier), and collective efficacy and engagement (acting together and involvement of all segments)	<i>“Let's get up and make a campaign to leave malaria from the country. Especially educated students, let's get up and teach uneducated student about malaria. And also come on my people, let's remove and eliminate malaria by disposing stagnant water and understanding each other's and also by raising or standing in unity. Everyone knows and protect yourself from the diseases (malaria).”</i>
Metaphors, similes, and personifications promoted malaria preventive practices	Contents that describes different figurative languages in order to convey beliefs, norms and practices related to malaria .It includes metaphors, similes and personification, irony ,litotes, metonymy, paradox, pun, synecdoche, and paradox.	<i>““If we expose ourselves to the diseases, who will fight us? If the person becomes diseases on his own, what malaria to do? A thief will enter the house through a door that he/she has opened. This mosquito has a lot of threating activities or works to do but when you see it seems like flies. It has a very wide mouth and feeds on human blood. It moves</i>

Metaphors	Contents that describes an expressions that are used to directly represent perceptions and practices according to mental models of the local community including proverbs, symbols, objects, situations, and phenomena.	<p><i>from person to person to lead its life.”</i></p> <p><i>A person looks malarial diseases as a bit diseases or lightest disease but if you don't go to health facility, it kills the persons... Let's get up and protect ourselves, don't lost human life While there is a solution.</i></p> <p><i>“Particularly, the people of Jimma, let's prevent (defeat) war of malaria. Why does it beat us while we can win it?”</i></p>
Similes	Description of contents in by their poems to express malaria and its relating things with a connective such as “like”. It includes an expression of anopheles mosquito, malaria and sign and symptoms of malaria related to another thing with a connective “like”.	<i>“It (malaria) makes me fevered like that of a strong sunny season... it makes me a colder and shivers like that of a heavy rainy season... The name of mosquito is anopheles mosquito... when you see (anopheles mosquito), it seems like flies.”</i>
personifications	Description of contents in the poems messages by using or assigning human characters to describe or explain situations or inhuman objects in relation to causes, signs, prevention and treatment of malaria.	<i>“From mosquito of malaria, biting is caused by female mosquito. It carries poison and finished the community. It doesn't fear the creator (God). And also in order to bans and sorrow/cry the people it works very hardly and replicates itself overly.”</i>
Codes	Definitions	Examples
Knowledge about malaria and its prevention	Description of information about malaria and its prevention measures in the poetic message of primary school students. It includes description of causes and modes of transmissions, mosquito breeding and biting behaviors, sign and symptoms, and ways of prevention, care of ITN, treatment and control of malaria.	<i>“The causes of malaria is plasmodium parasite and transmitted by female anopheles mosquito and there are ways of prevention of malaria like that of hanging bed net every day, spraying chemicals in the house and cleaning the environment “.</i>
Knowledge about sign and symptoms of malaria	Description of distinguishable signs and symptoms of malaria which ranged from feeling hot, headache, feeling cold, weakness, joint pain, relapse, vomiting, and etc.	<i>“These are the symptoms of malaria: it warms the body, causes headaches, makes you vomit and hates food, weakening the body, once you get better, it comes again and again, for infants and pregnant mothers by causing to feel cold it shakes the body, and it throws their head down.”</i>
Knowledge about ways of prevention and control	Contents that describe a means of preventing mosquito bites and malaria including sleeping under ITN, spraying house with IRS, disposing broken material that hold water, avoiding stagnant water, avoiding mosquito breeding site and keeping clean the environment	<i>“For this (malaria) diseases, it has many ways of prevention methods: cleaning effectively/correctly breeding site of mosquito, don't left the toilet open, avoiding broken materials that hold water, disposing and draining ponds that holds water, removing dead waste from the environment, ... hanging bed net by giving priority to sleep under bed net for pregnant women and under five children If there is shortage of bed net, because they are easily attacked and have weak body.... spraying chemicals in the house”.</i>

Knowledge about causation and mode of transmission of malaria	Contents that describe about how malaria diseases are happen /occurred. It includes that causation of malaria by plasmodium species and bite of anopheles mosquito when previous bite was made with someone who has the parasite plasmodium in their blood stream.	<i>“The way it (malaria) is transmitted is by female anopheles mosquito and the parasite is called plasmodium. It is transmit by sucking of one person’s blood which contains plasmodium parasite) to another person. Further it transmits the diseases for the peoples.”</i>
Knowledge about mosquito biting behavior	Description of contents about biting behavior of mosquito i.e. biting is mainly performed at night and morning time, feature of biting and feeding habits in by their poems messages.	<i>“Mosquito has a very wide mouth when it bites a person enters a person’s bloodstream and its bite is for the sake of reproduction and time of biting is during night and morning time.”</i>
Knowledge about mosquito breeding behavior	Contents that describe suitable breeding sites of mosquito like that of stagnant water, broken materials that hold water, grass, and swampy area in the students’ poetic messages.	<i>“It (mosquito) breeds on broken materials that hold water, stagnant water and grass (16, years old, grade 8, and male student in Limmu-Kosa district) And during winter and summer, it assembled and breeds on stagnant water and lays its eggs 50-70 at a time and completes its life cycle of metamorphosis. Then there will be plenty of them all over the world”.</i>
Knowledge about ITN care	Description of how ITN is cared in by their poems messages including washing of ITN with soap within 3 month and drying under shadow stitched when torn, and never used for any other purposes.	<i>“If ITN becomes dirty, wash with soap and dry it under shade and if it gets tear, repairing or mending it. And also bring up at 12 O’clock am LT...teach the people to not use for other purpose.”</i>
Misconception ,belief and malpractice in the community	Contents that describe presence of misconception, beliefs, and malpractice regarding malaria and its prevention and control methods, in by their poems’ messages and should be improved.	<i>“There are beliefs of boiling coffee as a treatment for malaria and using of previously saved drugs over the counter and using of bed net for tying cattle and laying grains in our community.”</i>
Misconception about causes	Description of contents in by their poems that is wrongly believed causes of malaria in their community like that of hungry, sleeping outdoors ,eating sugarcane, dirty foods, cold weather and etc. perceived as a causes of malaria.	<i>“Every person’s says where is the source (causes) of malaria... the diseases is not caused by lack/shortage of food, and sleeping outdoors”</i>
preventive and treatment malpractice	Contents that describe people believe in and follow local preventive/treatment modalities which need improvement. It includes malpractices concerning treatments like using herbs, and previously saved drugs, buying drugs over the counter, sharing from each other and also using bed net for laying grains, tying cattle and toilet construction.	<i>“Why drug interruption becomes our behavior? Isn’t it true that we spend money to be saved? And also there is giving of previously used and saved drugs for other persons... also there is discarding of the drugs which got from health facility. Please utilize it appropriately in order to become a medicine (treatment)”</i>
Threat perception from malaria and	It refers to contents that describe risk of experiencing and severity or seriousness of	<i>“Malaria affects and killed all my people in the past and caused to decreased Production</i>

risk condition	malaria.it includes risk conditions, perception of risk, and severity.	<i>and Productivity of the farm. Then it exposed to them for starvation.”</i>
Perceived risk or vulnerability	Contents that describe perception of likelihood of experiencing malaria in by their poems messages which includes initiating the community to feel risk of infection by malaria or it serious form, and also indicating pregnant women and under-five children are at high risk of experiencing worsening forms of malaria due to their low immunity.	<i>“Malaria attacked all persons without permission and difference in age (children and aged persons)... every/all person are attacked or affected by malarial diseases it doesn't fear the fatty persons and undermine the thin/slim persons it affects all persons”.</i>
Risk condition	Description of presence of risk condition that exposed to biting of mosquito and malaria in by their poems messages. It includes the presence of wastes, grasses, flat leaves of plants, swampy areas, stagnant waters, and broken utensils that are favorable for breeding of mosquitoes.	<i>“We stored water in the surface then it (mosquito) rests and stores the diseases on it. After that by biting it put the diseases on us. “Why do people stop pouring stagnant water in our area? Due to we didn't Clean our environment and disposing stagnant water .It breeds there then it bites us.”</i>
Perceived severity	Contents that describe perception about seriousness of malaria that happened in community. It includes description of causing loss of human life, economical loss, damage or limit to a person's physical or mental abilities, and its effect on farming activities in by their poems messages.	<i>“Malaria is very heavy diseases by spreading the diseases bothered everyone. It kills and disabled the persons quickly without assuming or recognizing the presence of the diseases ...and also it doesn't says father, mother, female and children it bans/destroy from the earth and cause to sorrow/cry every ones”.</i>
Perceived effectiveness of preventive measure	Description of contents that describes ability of preventive measure in helping the community to keep from malaria. It includes perception of effectiveness of bed net, IRS, cleaning the environment, treatment and drugs.	<i>“Using bed net every night, cleaning environment and spraying chemicals in house are effectives in protecting bites of mosquito and malaria.”</i>
Effectiveness of ITN	Description of perception about effectiveness of ITN in keeping bite of mosquito and malaria. It includes that active use of ITN can safeguard a family and community from risk of malaria and it can trap malaria causing mosquitoes. Considered as a preventive material in the fights against malaria.	<i>“You can protect yourself from malaria by sleeping under bed net ...I will suspend and sleep under bed net. Where you get me. Why do you bother to bite me? If you tauten bed net, it didn't get to bite for the second time”.</i>
Effectiveness of IRS	Contents that describe perception about working of spraying IRS in house and on water bodies in peak breeding seasons to kill mosquitoes that causes malaria in by their poems messages.	<i>“It is possible to eliminate/prevent malaria disease, by spraying antimalarial chemical in the home.”</i>
Effectiveness of cleaning the surrounding environment	Description of perception about regular cleaning of compounds and surrounding environments as effective means of reducing risk conditions and chances of mosquito breeding.	<i>By looking (cleaning) our environment hourly and destroying stored water in on time and by checking our villages' sanitation regularly, we will far away the mosquito from our villagesWe can prevent</i>

		<i>ourselves from malarial diseases, by keeping our environment clean”.</i>
Effectiveness of seeking at health facility	Contents that describe nearest health facility as effective ways of testing, ruling-out and managing malaria..	<i>“If you infected with malaria, by going to the nearest (local) health facility, you will get a treatment of malaria... If you see the symptoms of malaria, we should not die by sleeping in bed, but immediately by getting treatment saving life is a public duty”.</i>
Effectiveness of drugs	Description of contents that describe effectiveness of drugs in protecting deterring or avoiding of malaria. It includes that failing to complete anti-malaria drugs result in relapse, and professional prescriptions as the only best means of taking drugs.	<i>“If you look symptoms of malaria, take the persons to health facility, why do malaria eat us by knowing this (knowing of health facility as the best place of getting of treatment).Finishing a drugs which we were given by health provider is a must for us. It is our fault that leaving unfinished but if we finished the drugs, it becomes disappear from our body”</i>
Call to adopt malaria control practice and social and behavioral changes	Description of contents which explicitly called the exposed community and any other listeners/readers to adapt the practice of cleaning their surrounding environment, ITNs use, IRS, seeking treatment when symptoms are present and appropriate drug-use and social change and collective engagement on eliminating malaria from their community	<i>“We will eliminate malaria by working together and keeping unity. We will educate our community and take care of our acquaintances. Starting from father to son contribute for elimination of malaria. We’ll eliminate malaria from beginning this year. It did not kill us for the second time. We will not pass it on to the next generation. We will eliminate malaria by planning and working together or supporting each other (by connecting with hand by hand).”</i>
Clean the surrounding environment	Contents that describe performing of cleaning the environment to achieve the control over mosquito and malaria. It includes managing small water bodies/swampy or any surrounding conditions suitable for breeding including broken utensils, leaves of some plants like insect, and other wastes. Accordingly, draining waters, filing swampy areas, cutting leaves, and burning of wastes suggested as actions in the poem of students.	<i>“It (mosquito) breeds on broken materials that hold water, in stagnant water, and also in abundant in grass. So, if we get broken material, we will dig for it and buried in a pit (hole). For varies waste, it will be burned. Sleeping water will be avoided. Grass will be removed. And the environment will be checked for the sanitation regularly”</i>
Take precautionary measures for IRS	Contents of description that commanded the community to adapt IRS. It includes precautionary measures that prevent unintended effects of IRS by closing house for few minutes after spray and properly ventilating for hours.	<i>“Spraying anti-malarial spray is the third one (prevention methods).Let’s get out after spraying it. We will never enter in to home up to two hour of spraying and we will not open the door up to 15 minutes.”</i>
Utilization of ITN	Description of contents that calling the exposed community to actively engaging in utilizing ITN every night, by giving priority to pregnant women and under five children. It includes calling of the	<i>“We use bed net every night and also we will tie bed net and spend the night under it, where you get me? Why do you bother to bite me? After two month of owned bed net, we used for a rope, for tying calf; by forgetting</i>

	community to use ITN as a normal part of daily action and adopt everybody to every night and at all seasons and at the time of limits to give priority for pregnant women and under five children never missed when they owned and caring of ITN by regular washing; drying under the shade, and stitching when torn.	<i>our health we used it for cattle. These are not right way and why are we foolish. So, when we get the bed net we will use carefully in save. Why do we damage it? We will keep our health and eradicate malaria by using it. We'll tie the bed net and stay our healthy...if we are in trouble of bed net access, prioritizing infants and pregnant women are our obligation."</i>
Seeking treatment and drug use for malaria	Contents that encouraging the audiences to seek treatment when distinguishable sign are present.it includes treating of malaria at health facility other local practices may not work and seeking treatment within 24 hours of onset Following seeking of treatment is appropriate use of drugs meaning practicing professionals' prescriptions at any expense by completing the drugs according to the scheduled time of taking.	<i>"What will it (malaria) do, if we take completely the drugs? If the person is a disease on his own. What to do malaria? First of all, the man is a treatment for his own diseases. So, a man who destroys his /her drugs will sorrow by downing his head... finishing the drugs which was given by health providers is a must for us. Leaving unfinished is our fault. If we take the drugs completely the diseases will disappear from our body."</i>
Social change towards malaria elimination	Description of contents that calling the entire community and stakeholders to eliminate malaria through collective efforts and engagement. It includes practice of encouraging the need to have sense of ownership of the task of eliminating malaria (cleaning environment and management of mosquitoes), feeling responsibility (considering oneself as having role in the task), social cohesion (building networks and keep unity to accomplish pertinent practices mentioned earlier), and collective efficacy and engagement (acting together and involvement of all segments)	<i>"Let's get up and make a campaign to leave malaria from the country. Especially educated students, let's get up and teach uneducated student about malaria. And also come on my people, let's remove and eliminate malaria by disposing stagnant water and understanding each other's and also by raising or standing in unity. Everyone knows and protect yourself from the diseases (malaria)."</i>
Metaphors, similes, and personifications promoted malaria preventive practices	Contents that describes different figurative languages in order to convey beliefs, norms and practices related to malaria .It includes metaphors, similes and personification, irony ,litotes, metonymy, paradox, pun, synecdoche, and paradox.	<i>"If we expose ourselves to the diseases, who will fight us? If the person becomes diseases on his own, what malaria to do? A thief will enter the house through a door that he/she has opened. This mosquito has a lot of threating activities or works to do but when you see it seems like flies. It has a very wide mouth and feeds on human blood. It moves from person to person to lead its life."</i>
Metaphors	Contents that describes an expressions that are used to directly represent perceptions and practices according to mental models of the local community including proverbs, symbols, objects, situations, and phenomena.	<i>A person looks malarial diseases as a bit diseases or lightest disease but if you don't go to health facility, it kills the persons... Let's get up and protect ourselves, don't lost human life While there is a solution. "Particularly, the people of Jimma, let's prevent (defeat) war of malaria. Why does it</i>

		<i>beat us while we can win it?"</i>
Similes	Description of contents in by their poems to express malaria and its relating things with a connective such as "like". It includes an expression of anopheles mosquito, malaria and sign and symptoms of malaria related to another thing with a connective "like".	<i>"It (malaria) makes me fevered like that of a strong sunny season... it makes me a colder and shivers like that of a heavy rainy season... The name of mosquito is anopheles mosquito... when you see (anopheles mosquito), it seems like flies."</i>
personifications	Description of contents in the poems messages by using or assigning human characters to describe or explain situations or inhuman objects in relation to causes, signs, prevention and treatment of malaria.	<i>"From mosquito of malaria, biting is caused by female mosquito. It carries poison and finished the community. It doesn't fear the creator (God). And also in order to bans and sorrow/cry the people it works very hardly and replicates itself overly."</i>

Annex III: Networks done during Analysis

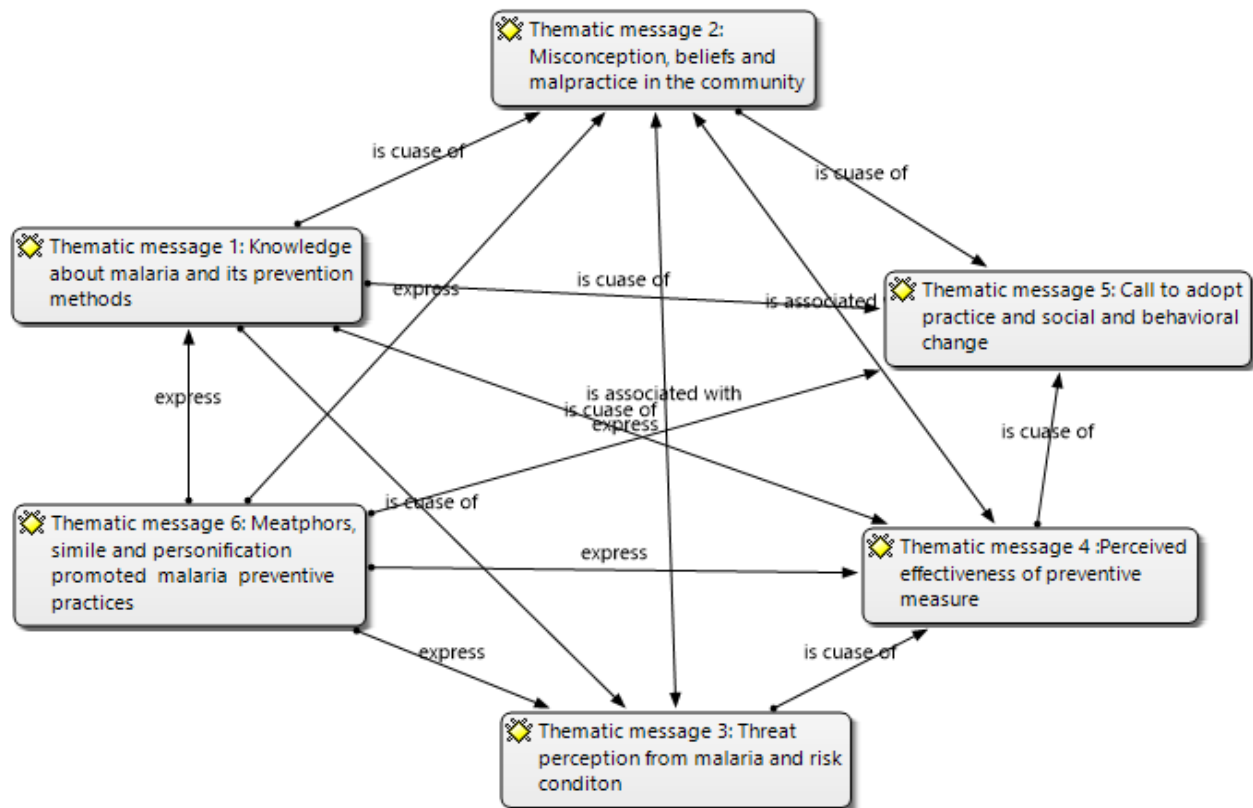


Figure 1: Networks developed from Content analysis of messages of malaria poems produced and disseminated by primary school students in Jimma Zone, Oromia, Ethiopia 2020

Table 2: Occurrences of thematic and categories of malaria message contents, in twenty students' poems Jimma zone, Oromia, Ethiopia, March, 2020.

Key malaria messages and categories	Counts (%)
Thematic message 1: Knowledge about malaria	216(36.0)
Signs and symptoms	66 (11.0)
Ways of prevention and control	59 (9.8.)
Causations and mode of transmission of malaria	51 (8.5)
Caring for nets	17 (2.8)
Mosquito breeding behavior	13 (2.2)
Mosquito biting behavior	10 (1.7)
Thematic message 2: Calls to adopt practices, and social and behavior changes	161(26.8)
Social changes towards malaria elimination	63 (10.5)
Cleaning the surrounding environment	42 (7.0)
Utilization of ITN	23 (3.8)
Taking precautionary measures for IRS	18 (3.0)
Seek treatment and drug-use for malaria	15 (2.5)
Thematic message 3: Threat perceptions from malaria and risk conditions	123(20.4)
Perceived severity	101 (16.8)
Risk conditions	15 (2.5)
Perceived risk or vulnerability	7 (1.1)
Thematic message 4: Perceived effectiveness of preventive measures	76(12.6)
Insecticide treated nets/nets (ITNs)	49 (8.1)
Cleaning surrounding	12 (2.0)
Use of drugs	6 (1.0)
Seeking at health facility or suggestive symptoms:	5 (0.8)
Indoor residual spray (IRS)	4 (0.7)
Thematic message 5: Misconceptions, beliefs, and malpractices in community	26 (4.3)
Preventive and treatment malpractices	23 (3.8)
Misconceptions about causes	3 (0.5)
*Total message occurrences	602(100.0)

*Counts of figurative speeches were excluded from the total, and independently reported in text.

DECLARATION

I declare that this research thesis report entitled “Content Analysis of Messages In primary School Students’ Malaria Poems in Jimma Zone, Oromia, Ethiopia: A qualitative study” is my own work that it hasn’t been addressed in study area as far as my knowledge touched and all resources I used has been indicated and acknowledged as complete reference. I understand that non-adherence to the principles of academic honesty and integrity, misconceptions/fabrications of any idea/data/source will constitute sufficient ground for disciplinary action by the University and also evoke penal action from the sources which have not been properly cited or acknowledged.

Name of student _____ Signature _____ Date _____

APPROVAL SHEET

As thesis research advisor, I hereby certify that I have read and evaluated this thesis report prepared under my guidance by Abdu Hayder entitled “Content Analysis of Messages In primary School Students’ Malaria Poems in Jimma Zone, Oromia, Ethiopia: A qualitative study”. I recommended that the report be submitted for implementation and further action as fulfilling the thesis requirement.

Name: Abdu Hayder

Signature: _____

1. Name of major advisor: Mr. Yohannes Kebede (MPH, Associate Professor)

Signature _____ Date _____

2. Name of co-advisor: Mr. Kasahun Girma (MPH, Lecturer)

Signature _____ Date _____

As member of the board of examiners of the MPH thesis report open defense, we certified that we have read and evaluated the thesis report prepared by Abdu Hayder and examined the candidates report. We recommend that the report be accepted for implementation and further actions as fulfilling the thesis requirements for the degree of Master of Public Health in Health Promotion and Health Behavior.

Examiner _____ Signature _____ Date _____