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KNOWLEDGE, ATTITUDE, PRACTICE, AND ASSOCIATED FACTORS OF PODOCONIOSIS AMONG ADULTS IN BAHIR DAR ZURIA DISTRICT, NORTH WEST ETHIOPIA.

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BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCE

SCHOOL OF PUBLIC HEALTH, DEPARTMENT OF HEALTH SYSTEM MANAGEMENT AND HEALTH ECONOMICS

KNOWLEDGE, ATTITUDE, PRACTICE, AND ASSOCIATED FACTORS OF PODOCONIOSIS AMONG ADULTS IN BAHIR DAR ZURIA DISTRICT, NORTH WEST ETHIOPIA.

BY;

MULUGETA ASHAGRIE

A RESEARCH THESIS SUBMITTED TO BAHIR DAR UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCE SCHOOL OF PUBLIC HEALTH DEPARTMENT OF HEALTH SYSTEM MANAGEMENT AND HEALTH ECONOMICS FOR THE PARTIAL FULFILMENT OF THE REQUIRMENTS FOR THE DEGREE OF MASTERS IN PUBLIC HEALTH.

MARCH, 2025

BAHIR DAR, ETHIOPIA

ASSESSMENT OF KNOWLEDGE, ATTITUD, PRACTICE AND ASSOCIATED FACTORS AMONG ADULTS IN BAHIR DARZURIA DISTRICT, NORTH WEST ETHIOPIA

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STUDY PERIOD	OCTOBER 5 TO DECEMBER,30, 2024
STUDY AREA	BAHIR DAR ZURIA DISTRICT NORTH WEST ETHIOPIA
TOTAL COST	54200 ETHIOPIAN BIRR

ACKNOWLEDGEMENTS

First I would like to thank Bahir Dar University College of Medicine and Health Science, School of Public Health, Department of Health System Management and Health Economics for giving me this golden opportunity to conduct this proposal. I would to like to express my heartfelt thanks to my advisors, Dr. Yared Mulu and Dr. Mohamed Hussien, who had been at an arm's length from the conception of the study protocol. I want to thank Bahir Dar Zuria Health Office for their cooperation to the development of this proposal .My acknowledgment also goes to my beloved parents for their tireless support and encouragement throughout the years of my study. I am also grateful to the staff of the Sekelet Health Center for their cooperation from starting until this time.

List of Acronyms and abbreviations

AA	Addis Ababa
HC	Health Center
HP	Health Post
IOCC	International Orthodox Christian Charity
LF	Lymphatic Filariasis
MFTPA	Mossy Foot Treatment and Prevention Association
NGO	Non-Governmental Organization
NTD	Neglected Tropical Disease
SNNP	Southern Nation Nationality and People
SPSS	Statistical package for Social Science
SSA	Sub Saharan Africa
WHO	World Health Organization

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ABSTRACT

Introduction: Podoconiosis is a chronic non-communicable form of elephantiasis that can contribute to significant disability and economic burden when not treated early. Increasing Knowledge, attitude, and practice prevents podoconiosis, reduces stigma and discrimination in the community, and increases economic productivity of once country. Evidence is scarce regarding knowledge, attitude, and practice of the residents and factors associated to podoconiosis in Bahir Dar Zuria District.

Objective: The purpose of this study was to assess knowledge, attitude, practice and associated factors of podoconiosis among adults in Bahir Dar Zuria district, Bahir Dar, Ethiopia 2024.

Methods: A community based cross-sectional study was employed among residents ages eighteen and above in Bahir Dar Zuria District from October 5 to December 30, 2024. Each Kebele was selected by lottery method and the sample size in the selected kebele was allocated proportional to seize. The data were collected by interviewer-administered and pretested questionnaires. The collected data were cleaned and entered to Epi data version 4.7 exported to SPSS 26Statical Package for analysis. Descriptive statistical summary measures such as frequencies, cross-tabs, and Chi-Square test ($\chi 2$) test were used for describing the study variables. In binary logistic regression p-value below 0.25 was included in multivariable analysis to get candidate variables and finally Variables with, a p-value of 0.05 were considered statically significant, and the odds ratios linked with these prospective variables were provided as a measure of strength of association.

Results: Most (86.9%) of the respondents knew about the term podoconiosis. Nearly 50 % of the participants understood prevention methods by avoiding marriage into a podoconiosis patient's family and 79% by avoiding contact with podoconiosis patients. In this study 82.0% of respondents had poor knowledge scores. Educational status and place of residences were independent predictors for knowledge score. Most (86.8%) of respondents had unfavorable attitude score towards podoconiosis. In multivariable logistic regression, knowledge score and place of residence were independent predictors. In terms of shoe-wearing practice, 337(79.9%) had worn shoes in their life

time. Attitude score, Knowledge score, and education were independent predictors of shoe-wearing practice.

Conclusion: Place of residence and education were independent predictors of knowledge. Most participants had poor knowledge scores and un-favorable attitudes towards podoconiosis causes, prevention, and treatment, including causation, care, treatment and prevention. Based on findings, awareness raising and behavioral change interventions, hygiene promotion, and further researches on knowledge attitude and practice towards podoconiosis were recommended.

Budget; 54,200 Ethiopian birr was needed to conduct this research finding

1 INTRODUCTION

1.1 Background

Podoconiosis is a chronic non-communicable, preventable and progressive form of elephantiasis that can contribute to significant disability and economic burden when not treated early and it produces lymphedema of the lower limbs. It is a form of elephantiasis that predominantly affects barefoot subsistence farmers in areas of red volcanic soil for more than 10 years duration(1). Although podoconiosis is not fatal, it causes social, economic, psychological and physical disability(2). It is characterized by progressive bilateral lower limb edema(3). Since the condition is caused by long-term soil exposure, it can appear in those as young as 15 years of age but usually does not manifest until the third decade of life(4) .The economic costs of the condition are also high, with direct treatment costs being equivalent to US$143 per patient per year. In addition, the physical challenges of the condition contribute to large productivity losses(5). The majority of patients are of working age; this has consequences for the wider community. Early symptoms mostly include itching of the skin of the forefoot and a burning sensation in the foot and lower leg. Early changes that may be observed are splaying of the forefoot, plantar edema with lymph ooze, increased skin markings, hyperkeratosis with the formation of moss-like papillomata, and 'block' (rigid) toes (6).

To diagnose podoconiosis, there are major and minor diagnostic criteria; below knee lymphedema, residence in endemic area during development of lymphedema ,barefoot walking for prolonged period time (more than 10 years) and some minor criteria like nodule ,toe fusion both feet affected, burning sensation on the feet, family history of the same illness (7). To diagnosis podoconiosis: definitive (3 major or 2major plus 2 minor or 1 major criteria) and probable (2major or 1major plus 2 minor or 5 minor criteria)(8, 7). There are different stages of lymphedema: mild, moderate, sever, and with acute attacks(9). Management of lymphedema include; hygiene, skin care elevation and exercise, footwear, wound care bandage, patient counseling.(10)Treatment is simple and cheap among that: foot hygiene, skin care, compression bandaging, socks and shoes, elevation and movement, and (in a minority of cases)

nodulectomy. However, many endemic communities and health professionals are unaware of this treatment because it is not available in many governmental health facilities (11, 12).

Nongovernmental organizations (NGOs) have been set up within Ethiopia to fill the gap, including the International Orthodox Christian Charities (IOCC), which started providing treatment podoconiosis in June 2010(13). Treatment is simple and effective yet evidence indicates that a proportion of patients become lost to follow-up. Evidence from International Orthodox Christian Charities (IOCC) treatment centers' registers suggests that a significant proportion of registered patients with podoconiosis fail to re-attend for treatment, putting them at risk of worsening disability associated with the lymphedema and attacks of acute adeno lymphangitis (14, 15).

1.2 Statement of the problem

The global elimination of lymphatic filariasis (LF) is a major focus of World Health Organization (WHO) (16). Although Podoconiosis is not associated with an increase in mortality, it causes physical, mental, social and economic impact(14). Many communities in endemic areas are not aware of cause, prevention, and treatment of podoconiosis as service is not given in many governmental institutions. (17, 18). Patients with podoconiosis are subjected to stigma, which can reduce their marriage, educational, and employment opportunities that resulting in their exclusion from places of worship and local meetings(5). A study conducted in Africa showed that they were half as productive as unaffected individuals, and their economic production loss and medical costs have been estimated to exceed US$16 million a year(4).

Another study conducted in medical schools podoconiosis-endemic African countries showed that, a significant number of the participants didn't know the cause, prevention, and treatment methods of podoconiosis. Based on that study, 24% of the participants believed that podoconiosis was caused by heredity, 28.8% believed it was caused by poverty, and 33.3% believed that children were riskier a group than other group of the community for podoconiosis, 33.6% by Truck drivers and other 11.9%. Participants knew prevention methods of podoconiosis were: eating a healthy diet (14.3%), Mosquito control (9.55 %), childhood vaccination (2.4 %), antibiotics (2.4%) and the rest of the participants didn't know how to prevent podoconiosis(19).

Although the treatment of podoconiosis is simple (self-care) and cheap, patients didn't get the opportunity in Ethiopia. Evidence from the clinic register suggests that a proportion of patients with podoconiosis didn't get treatment supplies. Lack of awareness about controlling mechanisms, was the first reason (20). The second problem addressed from the study were fear of stigma and discrimination and the last problem for treatment lost in podoconiosis were exposures for modifiable and non-modifiable problems (11, 21).

Research conducted in the southern region showed that the proportion of respondents holding at least one misconception about the causation was 93.5%. More than one half (55.8%) showed that stigmatization attitude towards the condition and misconception about prevention methods ranged from 52.0%-64.9%. Only 21.4% and 11.4% knew that matting floors and cementing floors could prevent podoconiosis, respectively. About 46.0% of community respondents had low Knowledge of podoconiosis, 37.1-55.7% showed stigmatizing and discriminating attitudes towards social interactions with podoconiosis patients, and 63.8% had unfavorable attitudes towards podoconiosis. Around 86.1% had worn shoes, and 54.2% were wearing shoes during the interview(22).

Based on 17553 household surveys in East and West Gojjam Zones, 1319 Patients were asked whether podoconiosis was prevented or not. About 37.5% believed podoconiosis was a preventive disease, and 40.4% believed the progression of the disease could be controlled. The rest, 40.3%, said that podoconiosis could not be prevented(23).

Despite patients exposed for disability and social stigma, there were no scientific data that show level of knowledge, attitude and practices of the community towards podoconiosis in the study area. This study will give information related to knowledge, attitude and practice for those governmental and non-governmental organization and it will reduce disability, stigma and discrimination related to podoconiosis in the study area as well as in Ethiopia and for podoconiosis endemic countries.

1.3 Significant of the study

This study provides information related to knowledge, attitude and practice about podoconiosis cause, prevention and treatment of the community in Bahir Dar Zuria District. Findings from this study also give valuable information to health care workers and plan how to increase residence knowledge of Bahir Dar Zuria District, and to get treatment service that reduce disease complication and health care cost. This study will also important for district health office, zonal and regional health administrators to plan and allocate resource and set intervention strategies. Therefore, it was imperative to study knowledge attitude and practice towards podoconiosis and associated factors of the community.

2. LITRATURE REVIEW

2.1 Community knowledge toward podoconiosis cause and prevention

Study conducted in podoconiosis endemic African countries showed that, 94% of the respondents knew that podoconiosis was prevented by wearing shoes, 44% of the respondents by washing daily, 14.3% said by eating healthy diet ,9.55% mosquito control, 2.4% children vaccination. From school participants 2.4% of the respondent didn't know the cause of podoconiosis(24).

Research conducted in southern region showed that, from 438 participants of the community 93.5 % had seen a patient with podoconiosis and 91.6 % had heard of the local terms podoconiosis. The proportion of respondents holding at least one misunderstanding about the causation was 93.5%. About 46.0% of community respondents had poor Knowledge about cause and prevention methods of podoconiosis(20).

Based on 17553 house hold surveys in East and West Gojjam zone, 1319 Patients were asked about the cause and prevention methods of podoconiosis. From those participants 41.3% didn't know the cause and prevention of podoconiosis while 18% responds said that bare foot walking was the cause of podoconiosis, 7% and 7.4% of the respondent said that heredity and condensation exposure of feet were the cause of podoconiosis respectively. Curse from God and mitch (inflammation resulting from sunshine exposure) were the response of the patient in household surveyed(10).

2.2 Community attitude toward podoconiosis patients

Research conducted in podoconiosis-endemic African countries showed that, more than one half (55.8%) had stigmatization attitude towards podoconiosis patients(24).Another study conducted in Rwanda showed that about 55.7% of the respondents had stigmatizing and discriminating attitudes towards social interactions with podoconiosis patients(25).

A research conducted in southern Ethiopia showed that, from 259 participants 64% were willing to live next door to affected person, 60 % were willing to share meal, 43.2% to make friends with affected person, 49.7% to work with affected person, 77.1% to marry someone from affected family(15).

Based another study conducted in Wolayita zone southern Ethiopia, 51.9% of the respondents felt that they may acquire podoconiosis and 37.1%-55.7% had stigmatizing and discriminating attitude towards podoconiosis patients like eating, working and living with them(20) .

A study conducted Bedelle zuria district, Oromia region showed that 63.8% of the respondents in the study had un favorable attitude to live , to marry and eat with podoconiosis patients(2).

In Amhara region 17553 house hold surveyed was conducted in East and West Gojjam zone, 1319 participants were asked their social interaction with podoconiosis patients and below one fourth(13.6 %) of the participants had stigmatization attitude towards podoconiosis at school, religious place, or in the market(10).

2.3 Community shoe-wear practice

Based on research conducted in southern Ethiopia, Wolayta zone, from 438 study participants, 86.1% of the respondent had ever worn shoes at least one in their life time and 54.2% were wearing shoes during interview. From those 56% of the respondents were males and 54% were females. Based on study conducted in Bedle zuria woreda average age of the respondents first wear shoes were 31 years. From the participants 41.8% vs. 58.2% females and 20.7% vs. 79.3% men were bare foot and were shoe during interview time respectively. The participants said that their homes were non-cemented, during farming time, they did not wear shoes(26).

The participants gave different reason why they didn't wear and wash their feet were, distances from water source were the first reasons, inadequate water source and did not get shoe that feet with their legs(19, 20). Based on study conducted in east Gojjam zone participants aver all self-care practice were 64% .Among participants practice 70% wore shoes and 10.9% washed their feet with soap daily (10) .

24. Factors associated with residents' knowledge on podoconiosis cause and prevention

Based research conducted in southern region, from 63% who had good knowledge, 45% were males and 55% were females. From this study the age of the participants above 40year were 84% 26% were less than 40 year. Respondents who had basic education were 18.0%, grades 1-

12 46.6% and 5.7% were attend university education. Marital status of the respondents was 70.9 % married and 2.7% divorced 26.4% didn't married(27).

Based on other research in Wolaita zone 91.6% of the participants knew the term podoconiosis and misconception about causation and prevention was 9.3%-62.9% and52%-64% respectively. From those participants 51.4% males and 48.6%females, 49.1% urban and 50.9% rural, 75.1% unemployed and 24.9% employed, 76.6% married and 25.3% single, 93.2% Christian 5.4% Muslim, 65% had less than 1000 birr monthly income and educational status can't read & write(20).

Based on survey conducted in east and north Gojjam zone 40.3% said that podoconiosis could not be prevented and 82.1% respondent's believed by wearing shoes. From those participants 50.8% were male and 88.9% were reproductive age group. From those participants 79.3% were didn't read and write and 74.5% were farmers(10).

2.5 Factors associated with Attitude towards podoconiosis

Study conducted in southern region showed that, from 63.9% of the participants who had favorable attitude towards podoconiosis, 63.1% were males and 36.9% were females, 67.7% were had high knowledge score and 32.3% were had low knowledge score (20).

Among another research conducted in Wolaita from 166 participants who had stigmatization attitude towards podoconiosis 51% female and 49% were males, 70 % were didn't read and write and 80% were married(9) . Another study conducted in east Gojjam zone showed that from 177 participants who had stigmatization attitude towards podoconiosis 53% were females and 47% were males 38% were didn't read , write, and 57% were live in rural area(10).

2.6 Factors associated with shoes wear practice

Study conducted in southern region, Wolaita zone showed that, from 86.1% who had worn shoes at list one in their life time and 54% who worn shoes during the interview time 54.6% were male and 45.4% were female. Participants from those who wear shoes, 70.3% were employed and 29.7% were un-employed, 62.2 were had high knowledge score (20).

Among another study conducted in east Gojjam zone, from 633 study participants who took treatment, 46.4 % were males, 31.4% were between ages between the ages of 56-65 years. In that study 80% were married and 84.4% could not read and write(23).

3. COCEPTUAL FRAME WORK

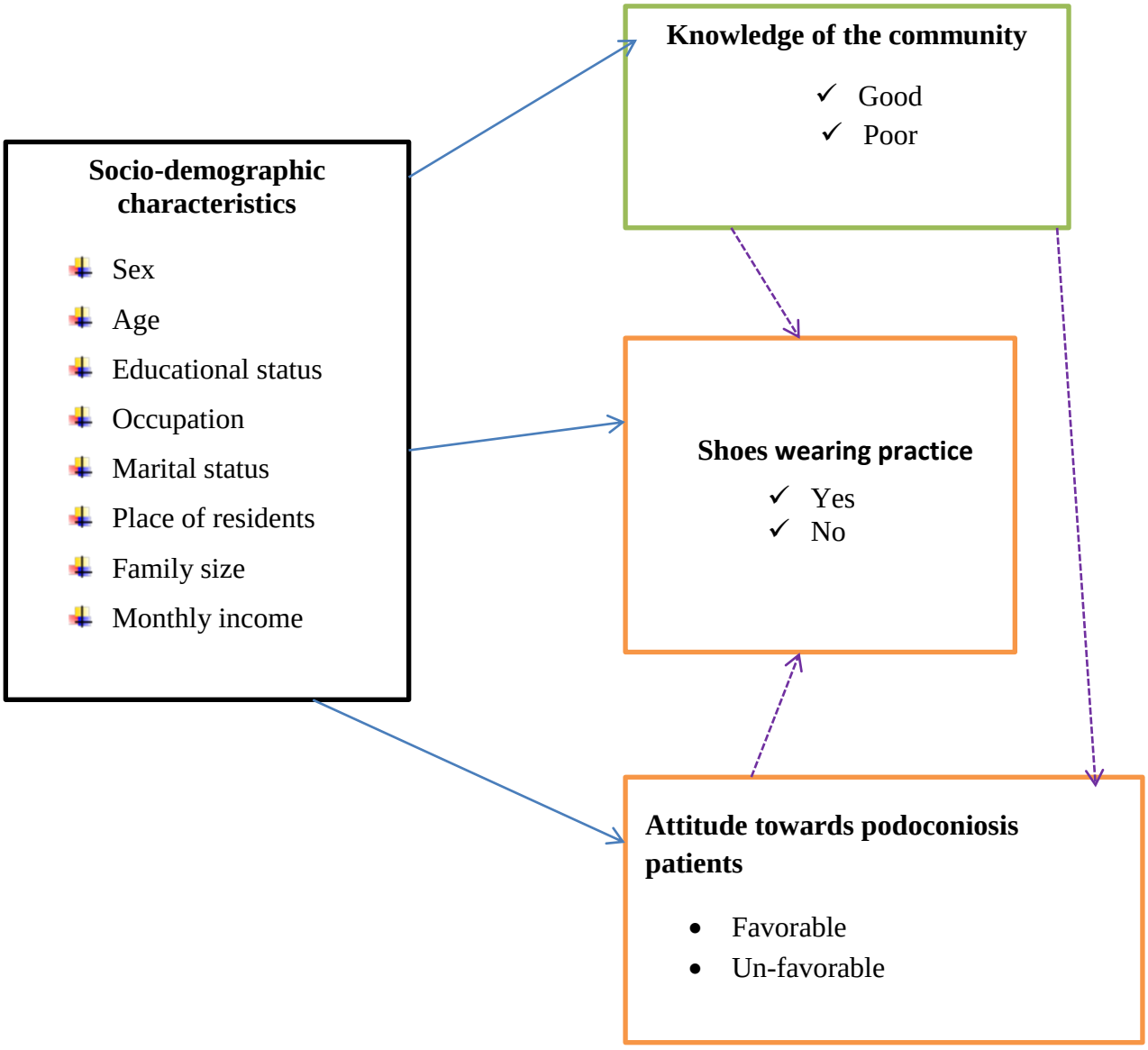

Figure1. Conceptual frame work of knowledge attitude, and shoes wearing practice of podoconiosis associated factors at community level in north Gojjam, North West, Ethiopia adopted from previous literature and guidelines(6)

4 OBJECTIVES

4.1 General objective

- To assess knowledge, attitude, practice and associated factors of podoconiosis among adults in Bahir Dar Zuria District, Bahir Dar,North West Ethiopia, 2024

4.2 Specific objective

- To measure knowledge of the adults towards podoconiosis in Bahir Dar zuria district, Bahir Dar, North West Ethiopia, 2024
- To measure attitude of the adults towards podoconiosis in Bahir Dar Zuria District, Bahir Dar, North West Ethiopia ,2024
- To determine practice of adults towards podoconiosis in Bahir Dar Zuria District, Bahir Dar, North West Ethiopia, 2024
- To identify factors associated with knowledge, attitude and practice among adults towards podoconiosis in Bahir Dar Zuria District, Bahir Dar, North West Ethiopia, 2024

5. METHODS AND MATERIALS

5.1 Study area

The study was conducted in Bahir Dar Zuria district in north Gojjam zone, North West Ethiopia. It is located at 565km North West of Addis Ababa, having latitude and longitudinal elevation between11025'N-11055'N and37004'E-37039'E, respectively with an average elevation of 1840m above sea level. The climatic zone of this district is woyina dega within an average annual temperature of 210c. In this district two types of soil namely red clay soil (63%) and brown (20%) are common. It covers 1,443.37 km2. It bordered on the south by Yilmana densa ,on the south west by Mecha, on the north west by Gilgel Abay river which separates Seman Achefer ,on the North by Lake Tana situates the city and special zone of Bahir Dar and on the east by Abay River which separates it from south Gondar zone and has a total population of 237,690 ,36 Kebeles, 9 health centers (HC) and 36 health posts (HP). It has 267 health professionals including health extension workers.

5.2 Study design and study period

Community based cross-sectional study was conducted from October 5 to December 30, 2014

5.3 Population

5.4 Source population

Source populations were all permanent residents whose age 18 and above in Bahir Dar zuria district.

5.5 Study Population

Study populations were all residents in selected kebele whose age 18 and above were our study population.

5.6 Inclusion and Exclusion Criteria

5.6.1 Inclusion criteria

- Those individual who live in selected kebele whose age 18 and above years old.

5.6.2 Exclusion criteria

- Those individual who were critically ill and an- able to participate.

5.7 Sample seize determination

The sample size was calculated by using single proportion formula given below;

$$n = \frac{Z\alpha/2^2\ P\ (1\text{-}p)}{(d)^2}$$

$n_1 = \frac{(1.96)^2 \text{ X } 0.56 \text{ X } (1\text{-}0.56)}{(0.05)^2} = 379$ where

$n_2 = \frac{(1.96)^2 \text{ X } 0.54 \text{ X } (1\text{-}0.54)}{(0.05)^2} = 381$

$n_3 = \frac{(1.96)^2 \text{ X } 0.52 \text{ X } (1\text{-}0.52)}{(0.05)^2} = 398$

n_1= sample size for good knowledge

$n_{2=}$ Sample size for favorable attitude

n_3= Sample size for shoes wearing practice

good Knowledge ,favorable attitude and shoes wearing practice were 56%, 54% and 52% respectively(podoconiosis study conducted in Wolayita zone, southern region of Ethiopia)(20).

Z=standard normal variable that at the confidential level of 95%

d= margin of error which is 5%

Sample size was also calculated for the second objective using epi-info version 7.2.5 and considering assumptions of 80% power, 95 % CI.

Variable	%outcome in unexposed	AOR	Sample size
Factors associated with attitude			
good knowledge score	32.3	2.23	258

Associated factors of shoes wearing practice during interview

Monthly income Birr/month	>301	1.45	340
Good knowledge	33.8	2.05	310

Therefore, the maximum sample size 398 from the first objective was taken. By adding 10% contingency at the original sample size 398 for the possible non response the final sample size became 438.

5.8. Sampling procedure

Simple random sampling technique was used to select 7 kebeles and the sample size was proportionally assigned to each selected kebele based on total population. From total 36 kebeles in Bahir Dar Zuria district, North West Ethiopia, seven kebeles (wonjeta, Robit, sekelet, Lata, Deque, Kinbaba and Lijomy) were selected randomly. By sampling proportional to size methods 38 study participants were selected from Sekelet kebele, 59 from Robit(11 urban and48 rural), 71 Lijjomy, 78 from Lata, 74 from Kinbaba(14 urban and 60 rural) ,41 from Deque and 58(10 urban and 48 rural) from Wonjeta kebele and finally after obtaining kebeles list systematic sampling methods to select households from selected kebele simple random sampling technique was used to select participants from selected households and Finally 438 participants were selected.

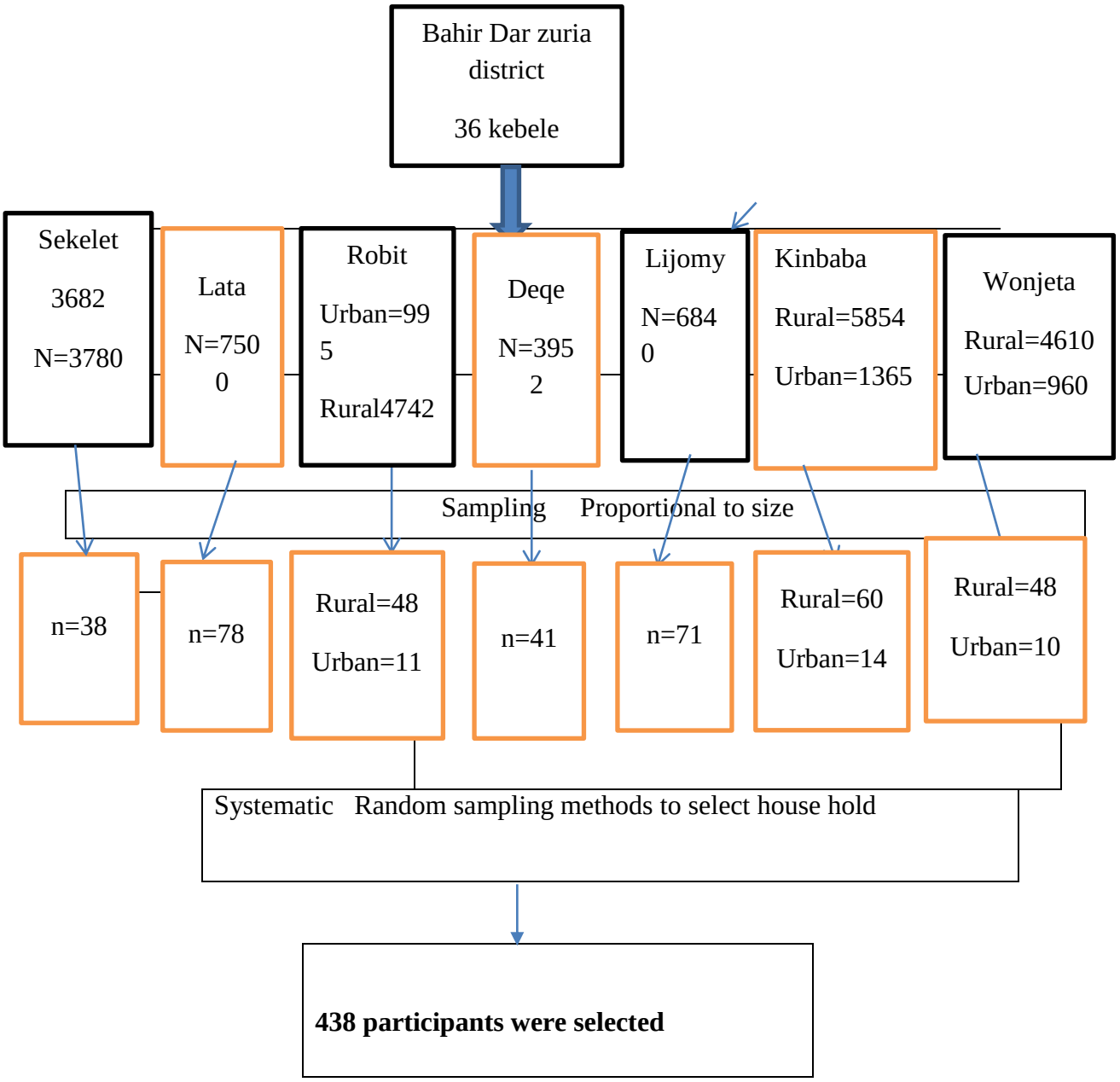

Figure 2; Schematic representation of sampling procedure

5.9 Study variable

5.9.1 Dependent variable

- Knowledge (good/poor)
- Attitude (favorable or unfavorable)
- Shoes wear practice (yes or no)

5.9.2 Independent variable

- Socio demographic factors
  - Age
  - Sex
  - Educational status
  - Occupation
  - Marital status
  - Family size
  - Income level

5.10. Operational definitions

Knowledge is assessed in terms of what the person knows about podoconiosis and whether this knowledge is true or false. A Person who score 75% or more knowledge question is said have a good knowledge(20).

Attitude is the predisposition to respond in a favorable or unfavorable manner towards a target (podoconiosis). Questions will be measured by using Likert scale as agree, neutral and disagree. Those individuals who score 75% or more of attitude questions is categorized as favorable attitude and participants who score below the75% categorized as in to unfavorable attitude(20).

Practice is those individual who wear shoes during interview time (yes or no)(22).

5.11 Data collection procedure

5.11.1. Data collection instruments

The data were collected by interview using structured and pretested questionnaires. The questionnaire has four main parts which was adapted and modified from different literature. The first part assesses the general socio-demographic characteristics; the second part knowledge related questions, the third and fourth attitude and practice of the residents towards podoconiosis respectively (10, 20, 25).

5.11.2 Data processing and analysis

The collected data was coded, cleaned, and entered to Epi-Data version 4.6 and exported to SPSS version 27 for analysis. Descriptive statistical summary measures such as frequencies, cross-tabs, and the Chi- Square test ($\chi 2$) test were used for describing the study variables. Bivariable and multivariable binary logistic regression analysis were performed to see the association between the outcome and independent variables. To measure reliability, Cronbach-S-Alpha rest was performed and each individual item measure above 0.7.

Variables with a p-value of 0.25 or below in Bivariable logistic regression were considered for multivariable logistic regression, Hosmer and Lemeshow was used to assess the model's fitness And variables with a p-value of 0.05 were considered statistically significant, and the odds ratios (OR) linked with these prospective variables were provided as a measure of strength, along with the relevant 95% confidence intervals (CI).

. 5.11.3 Quality control

The questionnaire was pretested among 22(5%) of the sample population. The pretest was conducted first, and the questionnaire was revised based on the results to guarantee clarity, sequence, and language. Three clinical nurses and one BSC nurses were recruited for data collector and supervisor respectively. The data collectors and supervisor were received one day training. Each day, the supervisor was monitor the data collection process and the researchers examined for completeness of information on a daily basis and any gaps discovered were promptly notified to the supervisor and data collectors.

5.12 Ethical consideration

Ethical approval confirmation was obtained from Bahir Dar University institutional review board. A support letter was taken from selected health facility's chief executive officer (CEO) or medical director, and the study participants were informed about the purpose of the study, the importance of their participation in the study, and written informed consent was obtained.

The study subjects were informed that any information they provided was kept confidential and personal information were not be left out for others to see. Data collectors did not take their names, and aggregated information was used. Their privacy on delivering the data were also be protected by facilitating a private interview site and they were informed they can decline any questions that they did not want to answer and the fact that the study was carried out in line with the Declaration of Helsinki.

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6. RESULTS

6.1 Community Socio-demographic characteristics

A total of 438(229 males and 209 females) participants were interviewed with age interval 18 and 82 in Bahir Dar zuria district participated. From the participant 146(33.3) were educate.

Table 1 Basic socio-demographic characteristic of respondents of the residents of Bahir Dar zuria district, Ethiopia, 2025

Socio-demographic variables	**Categories**	**Frequency (%)**
Age	18-27	24(5.5)
	28-37	235(53.7)
	38-47	116(26.5)
	48-57	41(9.4)
	58-67	17(3.9)
	>67	5(1.1)
Ethnicity	Amhara	436(99.5)
	Oromo	2(.5)
Place of residence	Urban	35(8)
	Rural	403(92)
Sex	Male	229(52.3)
	Female	209(47.7)

Address	Urban	35(8)
	Rural	403(92)
Occupation	Farmer	210(47.9)
	house wife	202(46.1)
	Government employee	6(1.4)
	Trader (Private business)	4(.9)
	Student	4(.9)
	Daily laborer	9(2.1)
	Unemployed	2(.5)
	Other	1(.2)
Literacy	Yes	146(33.3)
	No	292(66,7)
Educational level(146)	1-4	52(11.9)
	5-8	68(15.5)
	9-12	21(4.8)
	college or university	5(1.1)

Religion	Orthodox	431(98.4)
	Muslim	7(1.6)
Marital status	Single	74(16.9)
	Married	350(74.9)
	Windowed	9(2.1)
	Separated	3(.7)
	Divorced	2(.5)
Family size	1-3	147(33.6)
	4-6	258(58.9)
	7-10	30(6.8)
	>10	3(.7)
Monthly income	<1000birr	94(21.5)
	1000-1999	169(38.6)
	2000-2999birr	83(18.9)
	3000-4000birr	44(10.0)
	>4000birr	48(11.0)

6.2 Knowledge of residents about podoconiosis cause, prevention and treatment

In this study a total of 377 (86%) of the respondents were heard the term podoconiosis. In the questionnaire, respondents were asked cause of podoconiosis only 40.4% said by soil. In the study 63% of the participants' categorized podoconiosis as infectious disease. Related to prevention methods, 46.6 % said prevention methods by good personal hygiene, 46.1% by wearing shoes. From the participants 50% were had misunderstanding related to question avoiding marriage into podoconiosis patient's family and 46.1% by avoiding contact with podoconiosis patients were preventive methods of podoconiosis respectively. Multivariate regression was conducted from three independent variables (p value<0.25) and finally place of residence and educational status were independent predictor of knowledge towards podoconiosis.

Knowledge score of the community ranged from 3-16(out of 18) and those individual who scored below 10.0(below 75%) were categorized as having poor knowledge while scored 10.0 and above(75%) were considered to have good knowledge. In this study 82% of all respondents had poor knowledge and the rest 18% had good knowledge about podoconiosis.

Table 2 Result of knowledge related question of Bahir Dar Zuria District, Ethiopia, 2024

Knowledge questions/statements	**Response**	**N (%)**
Do you know podoconiosis?	Yes	377(86.1)
	No	61(13.9)
Podoconiosis is infectious disease	Yes	174(60.30)
	No	264(39.7)
Bare footed people highly affected by podoconiosis	Yes	136(31.1)
	No	302(68.9)
People having poor personal hygiene are highly	Yes	169(38.6)

affected by podoconiosis	No	269(61.4)
Is podoconiosis preventable?	Yes	203(46.3)
	No	235(53.7)
Podoconiosis could be prevented by avoiding contact with podoconiosis patients	Yes	347(79.2)
	No	91(20.8)
By avoiding marriage into podoconiosis patient's family prevents podoconiosis	Yes	223(50.9)
	No	215(49.1)
Wearing shoes could prevent podoconiosis	Yes	196(44.7)
	No	242(55.3)
Avoiding walking barefooted prevents podoconiosis	Yes	202(46.1)
	No	236(53.9)
Good personal hygiene prevents podoconiosis	Yes	203(46.3)
	No	235(53.7)
Podoconiosis is caused by heredity/familial defects	Yes	262(59.8)
	No	176(40.2)
Podoconiosis is caused by contact with podoconiosis patients	Yes	258(58.9)
	No	180(41.1)
Podoconiosis is caused by soil	Yes	177(40.4)
	No	261(59.6)
Podoconiosis is caused by flies	Yes	313(71)
	No	127(29)
Podoconiosis is caused by curse/spiritual causes	Yes	311(71)
	No	127(29)

Is it transmittable from person to person?	Yes	277(63.2)
	No	161(36.8)

6.3Attitudes of community towards podoconiosis

From total 438 participants, 327(75%) felt they might acquire the podoconiosis through their life time. Most respondents showed stigmatizing attitude to buy and sell an item with podoconiosis patients (80.8%), related to questions living together with individual who had podoconiosis, 22% were volunteer to live together with someone with podoconiosis. Less than one fourth of the participants (20%) categorized podoconiosis patients as work productive as that didn't have podoconiosis and 76.5% had positive attitude to support podoconiosis patients socially and emotionally.

A community attitude score was computed from responses for 16 attitude questions and statements. Favorable responses were scored 1 and unfavorable responses were scored 0. Those individuals who agreed 75% or more of attitude questions is categorized as favorable attitude and below were categorized unfavorable. Attitude scores 14 and below were categorized unfavorable and above 14 as favorable. Most (86.8%) of respondents had unfavorable attitude score towards podoconiosis .

In bivariate logistic regression analysis variables with a p-value ≤0.25 (Education, Knowledge score, and Place of residence) were included in multivariable analysis and finally knowledge score and place of residence were the candidate variables for favorable attitude. Participants with poor knowledge score were less likely to have a favorable attitude score as those with good knowledge score ((AOR=0.36, 95% CI 0.21-0.96 and P<0.01) and those individual who live in urban area were three times more likely to have favorable attitude as those with rural area (AOR=3.344, 95% CI ,1.409-7.939 and p<0.01) .

Table 3 Attitude related question result of the community, Bahir Dar zuria district, Ethiopia, 2024

Variables	Category	Frequency	Percent
I am at risk of acquiring podoconiosis	Disagree	107	24.4
	Neutral	2	.5
	Agree	329	75.1
Consistent footwear use can avoid or prevent podoconiosis	Disagree	130	29.7
	Neutral	3	.7
	Agree	305	69.6
Regular foot Washing prevents podoconiosis	Disagree	80	19.4
	Neutral	2	.5
	Agree	351	80.1
There is some treatment available for podoconiosis	Disagree	77	17.6
	Neutral	2	.5
	Agree	359	82.0
If you knew that, a shopkeeper or food seller had podoconiosis, would you buy food or an item from him?	Disagree	83	18.9
	Neutral	1	.2
	Agree	354	80.8
If served together with someone with podoconiosis, I feel happy	Disagree	93	21.2
	Neutral	2	.5
	Agree	343	78.3
People with	Disagree	86	19.6

podoconiosis can perform any work in comparable way to others	Neutral	5	1.1
	Agree	347	79.2
Wearing shoes will prevent podoconiosis	Disagree	105	24.0
	Neutral	10	2.3
	Agree	323	73.7
I often have tender, concerned feelings for people with podoconiosis	Disagree	99	22.6
	Neutral	7	1.6
	Agree	332	75.8
Podoconiosis cases should be supported socially and emotionally	Disagree	97	22.1
	Neutral	6	1.4
	Agree	335	76.5
If I had adequate knowledge on podoconiosis, I will participate on prevention activities	Disagree	67	15.3
	Neutral	11	2.5
	Agree	360	82.2
Little emphasis has been given to podoconiosis prevention and control by responsible organizations Valid Percent	Disagree	69	15.8
	Neutral	7	1.6
	Agree	362	82.6

Our society does not do enough to help	Disagree	290	66.2
	Neutral	10	2.3
	Agree	138	31.5
Podoconiosis cases should be isolated to prevent its transmission	Disagree	116	26.5
	Neutral	1	.2
	Agree	321	73.3
Podoconiosis is a curse or punishment from God for sins and is not preventable	Disagree	208	47.5
	Neutral	7	1.6
	Agree	223	50.9
Podoconiosis transmits from person to person	Disagree	277	63.2
	Neutral	10	2.3
	Agree	151	34.5

6.4 Shoes wearing practices of community towards podoconiosis

In terms of shoes wearing practice, 337(79.9%) had worn shoes in their life time and 247(56.4%), 145(33%) males and 102 (23%) females, 109(25%) educated and 138(32) were wearing shoes during the interview.

By logistic regression Attitude score, Knowledge score, and educational status of the respondents were independent predictors of wearing shoes during interview. Those individual who had poor knowledge score were less likely to wear shoes than good knowledge score (AOR=0.241, 95%CI, 0.119-0.488 and p<0.01), individual who had Unfavorable attitude were less likely to wear shoes than literate one (0.241, 95%, CI 0.119-0.488 and p<0.01) and educated individual were nearly two times as compare to non-educated one, (AOR= 2.374 9%CI, 1.466-3.844 and P<0.01)

Table 6.4 Multivariate analysis result of the dependent variables (knowledge score, attitude score and wearing shoes) Bahir Dar zuria district, Ethiopia, 2024

Variables	Responses	Knowledge score		Crude OR	Adjusted OR
		poor	Good		
place of residence	Urban	12	23	11.876(5.594-25.215)	7.875(3.523-17.422)**
	Rural	347	26	1.00	1.00
Educational status of the respondents	Yes	101	45	3.381(2.048-5.581)	2.056(1.166-3.626) *
	No	258	34	1.00	1.00
Sex of the respondents	Male	176	51	1.852(1.117-3.070	1.283(.736-2.235)
	Female	181	28	1.00	1.00

Variables	**Responses**	**Attitude score**		**Crude OR**	**Adjusted OR**
		Unfavorable	**Favorable**		
place of residence	Urban	19	16	7.238(2.767-9.673)	3.344(1.409-7.939)**
	Rural	361	42	1.00	1.00
Knowledge score					

	Poor knowledge	326	33	0.219(.121-.396)	0.356(0.182-0.696)**
	Good knowledge	54	25	1.00	1.00
Educational status	Yes	114	32	2.872(1.637-5.038)	1.684(.886-3.201)
	No	266	26	1.00	1.00

Variables	**Responses**	**Wearing shoes during interview**		**Crude OR**	**Adjusted OR**
		Yes	No		
Sex of respondent	Male	145	83	1.798(1.226-2.639)	1.372 (0.900-2.093)
	Female	102	105	1.00	1.00
Attitude score	Favorable	52	6	1.00	1.00
	Unfavorable	195	182	0.124(0.052-0.295)	0.169(.069-0.419)**
Knowledge score	Good	68	11	1.00	1.00
	Poor	179	177	0.164(0.084-0.320)	0.241(0.119-0.488)**
Educational status of the respondents	Educated	109	36	3.335(2.144-5.187	2.374(1.466-3.844)**
	Not educated	138	152	1.00	1.00
place of residence	Urban	31	4	6.602(2.288-19.050	2.051(0.628-6.694)
	Rural	216	184	1.00	1.00

* Significant at P<0.05,

** Significant at P<0.01.

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7. Discussion

The finding of the report showed that, 86% of the participants knew the term podoconiosis. This suggested that the awareness of the community were high. Study conducted in Southern region showed 91.6% knew the term podoconiosis. The difference might due to participants educational difference(33.3% vs. 57% were educated) (20).Further analysis was also conducted on cause ,prevention and treatments of podoconiosis community members had arrange of miss understanding about prevention methods ranged from 50.0%-79.2% i.e. by avoiding marriage into podoconiosis patient's family and by avoiding contact with podoconiosis patients respectively and which nearly similar cross sectional study conducted in east and north Gojjam zone, less than half of the participants knew prevention method of podoconiosis(37.5%) and 40.4% knew controlling methods of podoconiosis(10, 20)

When the knowledge score about podoconiosis was analyzed and adjusted for socio-demographic characteristics, education and place of residence were independent predictors. Individuals who live in urban areas had nearly three times good knowledge score than rural residence. This is higher than previous study in Oromia region, those individual who lived in urban area were had two times good knowledge than rural resident participants. This might be urban residence participants difference (8% vs5%).Educated participants had nearly two times good knowledge than non-educated participants. The previous study conducted in wolaita zone, were had similar finding (9, 28). In the previous study sex was independent predictor for good knowledge; males were had two times good knowledge score as compared to female participants. This difference might be due to participants' educational and topographic differences(20).

Most of the respondents (86.8%) had unfavorable attitude towards podoconiosis. Almost 80% of the respondents showed stigmatizing attitude towards buying , living together with someone with podoconiosis (22%) and 20% work productivity as compared to someone who didn't have productivity and 76.5% of the participants had positive attitude to support podoconiosis patient socially and emotionally. This result is supported by study conducted in southern region, 63% of the respondents had an unfavorable attitude towards podoconiosis and 37.1% -55.7% of the

respondents had stigmatizing attitude towards podoconiosis(20). Qualitative study conducted in southern region also gave supportive finding to this research(25, 29).

Multivariate analysis (bivariate logistic regression) was conducted for community attitude score; place of residence and knowledge score were independent predictor. Respondents who had a low knowledge score were less likely to have a favorable attitude as compared to those individual had high knowledge. This is again important, indicating likely effectiveness of awareness raising interventions on positively changing attitudes of the community towards podoconiosis and those individual who live in urban area were three times more likely to have favorable attitude as those with rural area. A study conducted in southern region showed similar result, knowledge score was independent predictors and those individual who had high knowledge score had nearly two times than low knowledge score. Around 79.9 % of the respondents in that interview were ever worn shoes and 56.4% of the participants were wear shoes during the interview time. The previous study in southern region Wolaita zone, southern region showed 30 of the participants were wear shoes. This might be explained by possible changes in shoe wearing practices with time and/or increased awareness on benefits of shoe wearing, study populations were selected in different area(30, 31).

Multivariate analysis (bivariate logistic regression) was conducted for community shoes wearing practice from the three independent variable (educational status, attitude score and knowledge score), educational status, knowledge score and attitude score were independent predictor. Educated Participant were nearly two times wear shoes as compared to non-educated Participants. Respondents who had poor knowledge score were less likely to wear shoes as compared to good knowledge score and attitude were one independent predictor for shoes wearing practice. Participants who had unfavorable attitude were less likely to wear shoes as compared to favorable attitude score. Similar research in southern region showed that ,respondents who that had high knowledge score 2.5 times as likely to wear shoes as compared with low knowledge score(30, 32). The finding also supported by study conducted in Nigeria and Uganda, those individual who had high were had two and three times shoes wearing practice respectively(25, 33).

8. STRENGTHS AND LIMITATIONS OF THE STUDY

7.1. Strengths of the study

The reliability of the data was maintained by prior training of the interviewers and the supervisors, regular supervision by the Principal Investigator and using pretested questionnaire. A Probability sampling technique was employed and same sex interviewers were used to minimize bias. Appropriate tests were employed and findings were compared with other related observations locally and internationally.

7.2 Limitation

I. Social desirability bias of the community could not be ruled out.
II. This study was based on cross-sectional data, which implies that the direction of causal relationships cannot assess.
III. Design effect was not used

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSIONS

- In this study a total of 377 (86%)respondents knew the term podoconiosis

  Miss understanding on causation, prevention and control of podoconiosis were affecting the community and a considerable proportion (82%) of respondents had low

  Knowledge on podoconiosis

- Respondents whose residence area in rural area and illiterate individual were found to have significantly lower knowledge on podoconiosis than males. This might indicate the need to consider on education
- Most (86.8%) of the respondents had unfavorable attitudes towards podoconiosis and tended to stigmatize and exclude people with podoconiosis from social activities and interactions
- Raising knowledge (high knowledge) on podoconiosis might be a key intervention to

  Change attitudes of community more favorably as it was independently associated with favorable attitudes and shoe wearing practice ($P<0.01$) and majority (56.4%) were wearing shoes during interview.

8.1. RECOMMENDATIONS

- **For Bahir Dar zuria district and non-governmental organization**

• Interventions aiming at education to reduce illiteracy

• Interventions to improve living conditions of the community (i.e. hygiene promotion, cementing floors, matting floors), to provide shoes, and treatment of podoconiosis patients, should be expanded and more attention given.

- **For health facility**
  - ✓ Awareness raising and behavioral change interventions should be initiated to improve community knowledge and attitudes towards causation, prevention and control of podoconiosis
  - ✓ Include podoconiosis as morning education program.

- **For researchers**
  - Moreover, to explore further factors related with knowledge, attitude and shoes wearing practice qualitative study is better to address patients with podoconiosis.

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ANNEX

6. Appendix I- Information Sheet

Assessment of knowledge, attitude, practice and associated factors of the community towards podoconiosis in Bahir Dar zuria woreda, Bahir Dar, North West Ethiopia

Dear participants;

My name is …….. This exercise is a partial fulfillment of the academic requirement for the award of my MSC in GMPH from Bahir Dar University. I would like to ask you for your assistance to answer the questions correctly and honestly as possible and remember that the information is entirely confidential. I will not going to record your name, hence there will be no way to link your responses to your name. Your responses will be reported only as aggregate data with other respondents. You are selected randomly to be one of the participants in the study. The study will be conducted through self-administer questionnaire. I will be asking you for a little of your time, about twenty-thirty minutes, to participate in this study. There is no incentive/payment given to you for participation. However, your participation is voluntary and you are free to with draw any time from the study. In the end, it is hoped that the information you give us could help for "Assessment of knowledge, attitude, practice and associated factors of the community towards podoconiosis in Bahir Dar zuria". If you need any further information you can contact the investigators through the following address.

Your cooperation and assistance is highly appreciated.

Best regard

Name:-MULUGETA ASHAGRIE, Cell Phone: 0928476880, BAHIR DAR, ETHIOPIA

Appendix II- English Consent Form

First of all I would like to thank you just to spend your time for me. As you know, podoconiosis is neglected tropical disease. So, I want to assess knowledge attitude and practice of the community to wards podoconiosis in Bahir Dar zuria woreda .You are one of the inputs for this study by responding to questions. This self-questionnaire will take about 20-30 minutes. You have the right not to participate or to withdraw any time in the self-questionnaire. The response

you give us will be used for the purpose of assessing knowledge attitude, practice and associated factors of the community to wards podoconiosis

Are you willing to participate in the study?

Yes, _____ (continue) No, _____ (Thank and stop)

Data collector name ----------signature _____

Part I Socio-demographic information of community

Code	Questions	Possible answers	Skip
101	Sex	1. Male 2. Female	
102	Where is your residence?	'Woreda'_____ 'Kebele'_____	
103	What is your age?	**1. _____** **99. I don't know**	
104	What is your current occupation?	1. Farmer 2. House wife 3. Government employee 4. NGO employee 5. Trader (Private business) 6. Student 7. Daily laborer 8. Unemployed 9. Other (specify): _____	

105	Are you able to read and write (in any language)?	1.Yes 2. No	**If yes go to code 103**
103	If yes, which level of education did you complete?	Basic education (only read and write) 2. Grade 1-12(specify): ____ 3. Above 12 grade 4. University/college education	
107	What is your religion?	1. Protestant 2. Orthodox 3. Muslim 4. Catholic 5. Not affiliated to any 6. Others (specify)_____	
108	What is your ethnicity?	1. Amhara 2. Oromo 3. Tigre 4. Other (specify)_____ 98. Unknown 99. Not willing to answer	
109	What is your current marital status?	1. Single (Never married) 2. Married	

		3. Widowed 4. Separated 5. Divorced 98.No data	
110	What is the family size of your household?	1 _____ 2. No other family member 98. Not willing to answer 99. No data	
111	What is your average monthly income (in *Birr*)?	1. <100 birr 2. 100-300 birr 3. 301-600 birr 4. 601-1000birr 5. >1000 birr 99. Not willing to answer_	

Part II: Community Knowledge, attitude and practice Questionnaire.

Knowledge Questions

Before you proceed, show the picture to the respondent

Code	**Questions**	**Possible answers**
301	Do you know this disease?	1.Yes

		2.No 3.I don't remember
302	Podoconiosis is infectious disease	1.Yes 2.No 3.I don't remember
303	Bare footed people are highly affected by podoconiosis	1. Yes 2. No I don't remember
304	People having poor personal hygiene are highly affected by podoconiosis	1. Yes 2. No 3 I don't remember
305	Is podoconiosis transmittable from person to person?	1.Yes 2.No 3.I don't remember
306	Podoconiosis swelling is preventable ?	1.Yes 2.No I don't remember
307	Podoconiosis could be prevented by avoiding contact with podoconiosis patients?	1. Yes 2. No 3. I don't remember
308	Podoconiosis Is preventable By avoiding marriage into podoconiosis patient's family prevents podoconiosis?	1. Yes

		2. No 3. I don't remember
309	Wearing shoes could prevent podoconiosis?	1.Yes 2.No 3.I don't remember
310	Avoiding walking barefooted during cold season prevents podoconiosis?	1.Yes 2.No 3.I don't remember
311	Good personal hygiene prevents podoconiosis?	1.Yes 2.No I don't remember
312	Podoconiosis is caused by heredity/familial defects?	1. Yes 2. No I don't remember
313	Podoconiosis is caused by contact with podoconiosis patients	1. Yes 2. No 3. I don't remember
314	Podoconiosis is caused by soil?	1. Yes 2. No I don't remember

315	Podoconiosis is caused by curse/spiritual causes	1.Yes 2.No I don't remember
316	Podoconiosis is caused by flies	1. Yes 2. No 3 I don't remember

III. Attitude assessment Questions to community

Please answer in the box corresponding to each question/statement

1- For I disagree 2- For Neutral/no idea 3- For I agree

Code	**Questions**	**Possible answers**		
401	I am at risk of acquiring podoconiosis	1	2	3
402	Consistent footwear use can avoid or prevent podoconiosis	1	2	3
403	Podoconiosis transmits from person to person	1	2	3
404	Regular foot Washing prevents podoconiosis	1	2	3
405	There is some treatment available for podoconiosis	1	2	3
406	If you knew that, a shopkeeper or food seller had podoconiosis, would you buy food or an item from him?	1	2	3

407	If served together with someone with podoconiosis, I feel happy	1	2	3
408	Podoconiosis cases should be isolated to prevent its transmission	1	2	3
409	Podoconiosis is a curse or punishment from God for sins and is not preventable	1	2	3
410	People with podoconiosis can perform any work in comparable way to others	1	2	3
411	Wearing shoes will prevent podoconiosis.	1	2	3
412	I often have tender, concerned feelings for people with podoconiosis	1	2	3
413	Podoconiosis cases should be supported socially and emotionally.	1	2	3
414	Our society does not do enough to help people with podoconiosis	1	2	3
415	If I had adequate knowledge on podoconiosis, I will participate on prevention activities	1	2	3
416	Little emphasis has been given to podoconiosis prevention and control by responsible organizations	1	2	3

IV. Practice Questions to community

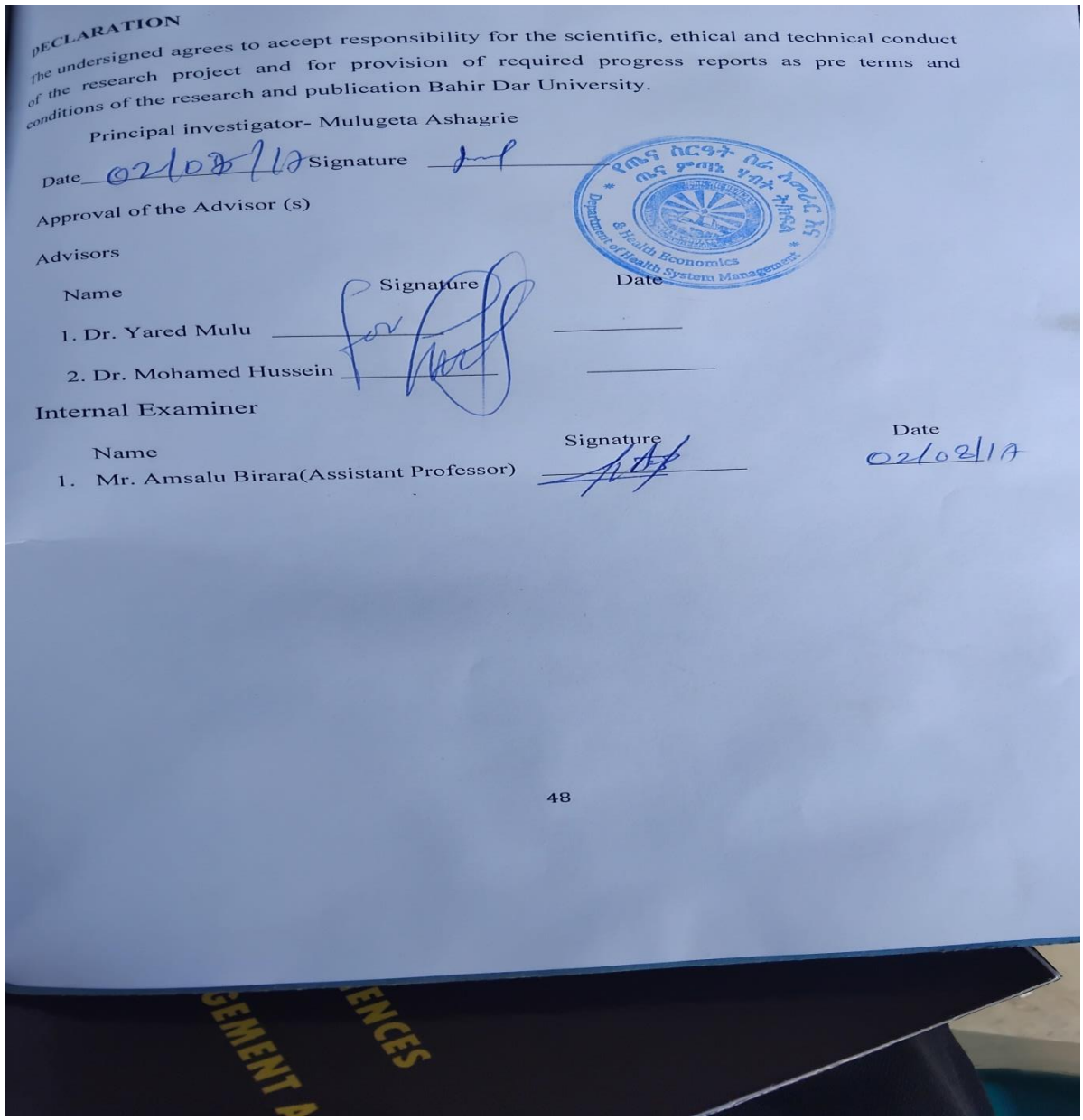
Code	Questions	Possible answers	Skip
501	Have you ever worn shoes?	1. Yes 2. No	If no, go to code 506

502	Observe whether wore shoes or not during interview	Yes No	
503	If yes for 501, how often do you use footwear?	regularly only at home regularly only at work places always except during working in garden/plowing 5. sometimes other specify	
504	What kind of footwear you commonly use?	plastic shoes/boots reaching legs plastic shoes/boots not reaching legs leather shoes/boots reaching legs leather shoes/boots not reaching leg other(specify)_____	
505	Are there any problems of using your footwear?	Yes No	If no, go to code 507
506	If yes what are the problems? Circle one for each alternative	1. bad smell 2. uncomfortable to walk, work odd to wear shoes in the community others(specify)_____	
507	Why you do not wear shoes?	1. I don't have any shoes 2. Uncomfortable to work and walk 3. No fitting size	

		4. unable to afford cost 5. bad smell 6. Other(specify) _____	
508	What do you do to prevent podoconiosis? Circle all that applies	1. I do nothing 2. wear shoes 3. good feet hygiene 4. cemented floors 5. matted floors 6. other(specify) _____	
509	Are you willing to wear shoes if you are provided with some?	1.Yes 2.No	If No go to 510
510	Why will you not use shoes?	1. Uncomfortable to walk or work 2. No fitting size 3. wearing shoe is strange in the community 4. bad smell from shoes 5. Other(specify) _____	

Thank you for participating in this study

Collected by _____ Sig. _____ Date _____



DECLARATION

The undersigned agrees to accept responsibility for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as pre terms and conditions of the research and publication Bahir Dar University.

Principal investigator- Mulugeta Ashagrie

Date 02/08/17 Signature

Approval of the Advisor (s)

Advisors

Name	Signature	Date
1. Dr. Yared Mulu		
2. Dr. Mohamed Hussein		

Internal Examiner

Name	Signature	Date
1. Mr. Amsalu Birara(Assistant Professor)		02/08/17

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