



ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
SCHOOL OF MEDICINE

KNOWLEDGE OF AND ATTITUDE TOWARDS LEPROSY AMONG NON
LEPROSY PATIENTS VISITING ALERT HOSPITAL FROM MAY 2021 TO
AUGUST 2021 G.C, ADDIS ABABA , ETHIOPIA

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ACRONYMS

- o A.A - Addis Ababa
- o AAU - Addis Ababa university
- o ALERT - All African Leprosy Rehabilitation and Training center
- o FMOH - Federal Ministry of Health
- o WHO- World health organization
- o E.C - Ethiopian Calendar
- o G.C- Gregorian Calendar
- o B.C- Before Christ
- o IRB - Institutional review board
- o OPD- Out patient Department
- o G2D- Grade 2 disability
- o NTD- Neglected tropical disease
- o MDT- Multi drug therapy
- o BCG- Bacillus calmette guerin
- o M.LEPRAE- Mycobacterium leprae
- o PB- Pauci bacillary
- o MB- Multi bacillary
- o SNNPR- Southern nations, nationalities and people's region

Abstract

Background: leprosy is a chronic infectious disease caused by *Mycobacterium leprae*, that predominantly affects the skin and peripheral nerves, resulting in neuropathy and associated long-term consequences, including deformities and disabilities. The disease is associated with stigma, especially when deformities are present.

Objective: To assess the level of knowledge and attitude towards leprosy among non leprosy patients visiting ALERT Hospital from May 2021 to August 2021 G.C.

Method: A cross sectional study was conducted among patients who visited ALERT hospital in the time frame mentioned above . The data was collected by using a structured self-administered questionnaire. Then was analyzed using SPSS Version 25. The results will be shared to ALERT hospital, AAU College of Health Sciences, department of Dermatovenereology, School of Public health and FMOH.

Results: Among 260 study participants, 249 (95.76%) of them had heard about leprosy. Among the study participants who had heard of leprosy, only 25 (10%) of them had high level of knowledge of leprosy. Binary logistic regression revealed that study participants who completed primary, secondary school and Diploma and above ($P=0.007, 0.003$ and 0.023 respectively) were significantly associated with high level of knowledge of leprosy.

Out of 249 study participants who had heard of leprosy, 183 (73.5%) had a favorable attitude toward leprosy. Study participants who are in age range between 18-25 and not educated ($P=0.011$ and 0.044) and those who completed grade 1–8 and farmers ($P= 0.003$) were significantly associated with favorable attitude toward leprosy. Having high knowledge of leprosy was NOT associated with favorable attitudes toward leprosy

Conclusion: This study revealed low overall knowledge of Leprosy among the non Leprosy patients visiting Alert Hospital . Having a high overall knowledge level on leprosy has not been shown to support a favorable attitude toward leprosy.

1.INTRODUCTION

1.1 Background

‘Leprosy, neglected tropical disease, is a chronic infectious disease caused by *Mycobacterium leprae*, an acid-fast bacillus. The disease mainly affects skin, peripheral nerves, mucosa of the upper respiratory tract and the eyes.’(National guidelines for TB,DR-TB and LEPROSY in Ethiopia,2017).Although treatment exists, access is limited and if it is not initiated early in the course of the disease, the control is limited and permanent disability can occur.(Lazo.porras et al.,2020).

Previously leprosy was more common in temperate climates (e.g. Europe), but currently it is mainly confined to tropical and subtropical regions.(Guidelines for the diagnosis, treatment and prevention of leprosy.,2018).‘Despite the elimination of leprosy as a public health problem (defined as achieving a point prevalence of below 1 per 10 000 population globally in 2000 and at a national level in most countries by 2005), leprosy cases continue to occur. Over 200 000 new leprosy cases were reported in 2016.’(National guidelines for TB,DR-TB and LEPROSY in Ethiopia,2017).Most of them come from developing countries such as Brazil, India and Indonesia. These nations accounted for 81% of new cases. (Lazo.porras et al.,2020).

‘In Ethiopia, a total of 3,970 new leprosy cases (with 85% MB) were registered in 2015. The proportion of children among new cases of leprosy was 14.2% and 31% were females. 10.6% of new cases of leprosy had disability grade II at diagnosis on the same reporting period.’ (National guidelines for TB,DR-TB and LEPROSY in Ethiopia,2017).

Leprosy affects both sexes and individuals in all age groups, but the age group mainly affected is between 15 and 45 years. Factors like to poverty increase the risk of leprosy.(National guidelines for TB,DR-TB and LEPROSY in Ethiopia,2017).

Means of transmission of leprosy is not completely understood, although it is said to be through inhalation of droplets containing the causative bacteria. ‘However, transmission via skin contact or other means cannot be entirely excluded. Leprosy has a reservoir in armadillos and a few other animals.’(WHO, Guidelines for the diagnosis, treatment and prevention of leprosy.,2018).

As host immunity plays a major role in disease progression and control up to 95% of patients exposed to *M. leprae* will not develop the disease. Incubation period after infection is variable and ranges from 2 to 20 years, or longer.(WHO, Guidelines for the diagnosis, treatment and prevention of leprosy.,2018).

Leprosy affects infected patients in different ways, depending on their immune response. Those with high level of immunity harbour a low number of bacilli and are called patients with PB leprosy(a case of leprosy with 1 to 5 skin lesions, without demonstrated presence of bacilli in a skin smear) and those with abundant bacilli in the body are termed as patients with MB leprosy(a case of leprosy with more than five skin lesions or with nerve involvement (pure neuritis, or any number of skin lesions and neuritis) or with the presence of bacilli in a slit-skin smear, irrespective of the number of skin lesions).(National guidelines for TB,DR-TB and LEPROSY in Ethiopia,2017).

‘Leprosy is diagnosed by finding at least one of the following cardinal signs:

(1) definite loss of sensation in a pale or reddish skin patch;
(2) thickened or enlarged peripheral nerve, with loss of sensation and/or weakness of the muscles supplied by that nerve; (3) presence of acid-fast bacilli in a slit-skin smear.’(WHO,Guidelines for the diagnosis, treatment and prevention of leprosy.,2018).

The main aim of treatment is to cure from the disease and prevention of drug resistance and relapse. Early detection and effective treatment of cases also reduces disability and disease burden in patient and their family. In addition, BCG vaccine is an effective tool for prevention of leprosy.(WHO,Guidelines for the diagnosis,treatment and prevention of leprosy.,2018).

Limited studies were done in Ethiopia regarding knowledge gap and attitude toward leprosy. Previous studies show that there is stigmatizing attitude toward leprosy affected individuals(Tesema and Beriso,2015;Urgesa et al.,2020) and low level of knowledge(Tesema and Beriso,2015; Abeje et al.,2016) among community members

in different regions. In these studies majority of the participants believe that leprosy is a hereditary disease and mainly transmitted through sexual or casual contact.

1.2. Statement of the problem

‘Leprosy is a neglected tropical disease (NTD), which still occurs in more than 120 countries, with more than 200 000 new cases reported every year.’ Among these 60.2 % was MB cases globally and ranges from 47.5% (in Comoros) to 94.8% (in Senegal) in the Africa region. Globally, 38.8% of reported new cases in 2015 were female while new child cases were 8.9%. The rate of new G2D was 6.7% globally which is mainly due to delay in case detection. (Lazo porras et al., 2020)

Leprosy associated physical deformities and disabilities are more common than other infectious diseases. Stigmatization and discrimination of persons affected by leprosy continues to hamper early detection of the disease. (Global leprosy (Hansen disease) update, 2019: time to step-up prevention Initiatives, 2020). self-stigma which result from leprosy associated disabilities can hinder persons’ activities, social involvement, and cause physical dysfunction. (Blok, De velas and Richardus., 2015).

‘Although the prevalence of leprosy in Ethiopia has declined over time after the introduction of effective multidrug therapy, the emergence of new cases is still challenging for the national health sectors. In Ethiopia, the presence of stigmatizing attitudes toward leprosy patients was also indicated.’ (Urgesa et al., 2020)

Negative attitude of the community toward leprosy would negatively affect the quality of life of leprosy patients. Patients with negative perceptions also last long undiagnosed, which favors the continuous transmission of infection and permits progression of the disease and more severe disability. (Urgesa et al., 2020).

Increasing the patient and community perception toward leprosy is one of the important interventions to control leprosy and its complications. In addition, enhancing positive attitudes toward leprosy-affected persons can reduce the community stigma and enhance their early health-seeking behavior and quality of life. (Urgesa et al., 2020).

However, community-based awareness of leprosy for better control and prevention of leprosy in Ethiopia has been neglected and not sufficiently studied. Therefore, the aim of this study was to assess the level of knowledge and attitude toward leprosy among non leprosy patients visiting ALERT hospital.

1.3. Significance of the study

Leprosy, caused by *Mycobacterium leprae*, is a neglected tropical disease mainly affecting the skin and peripheral nerves. Despite the existence of MDT, limited access and lack of early initiation of therapy results in partial control of the disease and permanent disability. 'Research on leprosy is scarce, limiting the development of new strategies. Additionally, in the general population leprosy is feared and misunderstood. Patients, who suffer this disease, since biblical times, are victims of ostracism, stigma and neglect in many cases.' (Lazo porras et al., 2020)

Significance of this study to identify knowledge gap about leprosy cause, transmission, treatment and prevention modalities among patients/community. Previous studies among different community members in Ethiopia (Abeje et al., 2016; Tesema and Beriso, 2015) showed that significant misconception about leprosy cause and transmission and stigmatizing attitude towards affected persons.

The findings of this study may help in improving Health Education about the cause, prevention measures and Identifying the knowledge and attitude gap will help to propose possible intervention.

2.Literature review

Leprosy is a chronic infectious disease which causes life time suffering of affected individuals and their families due to the resulting physical disability and also leads to social stigma and discrimination. It is still endemic in some developing countries, as the disease is transmitted person to person. 'From biblical times to the modern period, leprosy has been described as a horrifying disease due to the physical appearance of infected individuals. Leprosy results in disfigured limbs and creates marks of cultural dishonour that have caused "lepers" to remain on the darker side of society.'(Penna and Penna,2012) .

First confirmed cases of leprosy were reported from sacred Indian and Egyptian texts that describe an affected individual's loss of finger and toe sensations around 600 BC. 'However, the disease originated in Eastern Africa or the Near East and spread with successive human migrations. 'Then the spread of leprosy into West Africa and the Americas was by the Europeans and/or North Africans through the transatlantic slave trade within the past 500 years.(Penna and Penna,2012 and Sori,2019)

WHO set elimination goal for leprosy as a public health problem defined as "achieving a point prevalence of below 1 per 10 000 population globally in 2000 and at a national level in most countries by 2005",but leprosy cases continued to occur. In 2016 more than 200 000 new leprosy cases were reported globally .(Guidelines for the diagnosis, treatment and prevention of leprosy.,2018).

'In 2018, there were 15 countries reporting more than 1,000 new cases of leprosy.' These were Bangladesh, Brazil, DR Congo, Ethiopia, India, Indonesia, Madagascar, Mozambique, Myanmar, Nepal, Nigeria, Philippines, Somalia, Sri Lanka, and Tanzania. Only three countries (India, Brazil and Indonesia)contribute for more than 80 % of all the cases worldwide.(Lazo porras et al.,2020; Blok,De velas and Richardus,2015).

Ethiopia, one of the 17 nations reporting ≥ 1000 new cases per year in 2010, reported 4000-4500 new cases at health facilities annually between 2004 and 2010. Ethiopia is the second highest country in Sub Saharan Africa.(Sori,2019).

The total number of leprosy patients registered in the country was 5,303, and of these, 4,430 were new cases. Of the new cases, 1,308 and 331 were female and children respectively and 357 recurrent cases were recorded.(National guidelines for TB,DR-TB and LEPROSY in Ethiopia,2017; Sori,2019).

‘Although the World Health Organization (WHO) announced that Ethiopia reached the leprosy eradication target of 1 case/10,000 population in 1999, the incidence has not changed noticeably.’(National guidelines for TB,DR-TB and LEPROSY in Ethiopia,2017).

In Ethiopia, who ranked 7th among the 18 countries that account for >90% of all new cases globally in 2009; the reported average number of new cases was 4524 between 2001-2011. ‘This translated to a drop in national case announcement rate of 0.8/10,000 to 0.6/10,000.’(National guidelines for TB,DR-TB and LEPROSY in Ethiopia,2017; Sori,2019).

A 0.16 to 0.76/10,000 case notification rate in SNNPPR and Oromia respectively defines the regional discrepancy and among regions, 2,046 l(49%) were reported from Oromia followed by Amhara region with 1,409 cases (34%) and SNNPR region 348 cases (8%). These three main regions constituted 91% of all the cases reported in Ethiopia(Sori,2019).

After the introduction of Multi-Drug Therapy\ (MDT) in 1983, the prevalence of leprosy has markedly decreased from 19.8/10,000 populations in 1983 to 0.5/10,000 populations in 2012.A total of 126,592 new cases were detected and 149,592 patients were released from treatment after the introduction of MDT says MOH. However, detection of new leprosy cases have been consistent over the last ten years starting from 2001.(Sori,2019).

Leprosy is becoming localized to a limited number of countries and even within countries spatially unevenly distributed. The spread is highly dependent in susceptibility of individuals and the intensity of contact. Hence leprosy patients are often found to be spatially clustered in regions, neighborhoods, families and

households . Closest contacts to the index patient, particularly household contacts, are at high risk.(Blok,De velas and Richardus,2015).

A study done in India indicated that more than 30% of people affected by leprosy have mental health problems, prevalence of depression and anxiety symptoms was, 33% and 19% respectively. Presence of disability, female gender, lower income group and low education were significantly associated with depression and symptoms of anxiety. As the severity of disability increased, risk of developing depression and anxiety increased.(Govindasamy K.,2021).

Leprosy patients face significant stigma from their communities due to lack of adequate knowledge. For example, in a study done on community knowledge and attitude among 728 randomly selected households in Fedis District, Eastern Ethiopia showed that 608 (83.52%) had heard about leprosy, less than one-third (30.92%) stated that bacteria was the causative agent of leprosy and 256 (42.11%) considered leprosy a hereditary disease. Slightly lower than one in five (17.93%) reported leprosy is a curse from God and 100 (16.45%) perceived that it is a punishment for the sin of the family. Prolonged contact with leprosy patients was stated as the main route of transmission by 221 (36.35%) . 226 (37.17%) accurately responded that leprosy can be transmitted through aerosol droplets from patients. The majority, 472 (77.63%) responded that leprosy is a curable disease and most, 550 (90.46%), suggested that leprosy can be cured by modern medicine.Among participants 270 (44.41%) believed that it was shameful to share public transport with leprosy patients. Only 103(16.94%) would allow their children to marry someone from a family who had a history of leprosy. A quarter, 155 (25.49%), would allow their children to play with children from a family who had a history of leprosy. More than half, 341 (56.09%) would feel innocent to work with some who have leprosy in the same environment; although about 400 (65.79%) would feel ashamed to have someone with leprosy in their family. About half, 298 (49.01%) would allow sharing dishes/plates with leprosy patients(Urgesa et al.,2020).

In a study done in Kuyera Town, West Arsi Zone, Oromia Region Southeast Ethiopia on Assessment of Knowledge and Attitude of Community on Leprosy among 296 study participants 57 (19.31%) had high level knowledge on leprosy. Majority 205

(69.26%) knew that leprosy can lead to deformities and disfigurements, 143 (48.31%) believe the disease is caused by bacteria, 120 (40.54%) believe it is due to curse or punishment by God and 228 (77.03%) said it is hereditary. 105 (35.47%) believe leprosy is transmitted by having sexual contact with leprosy patients. 275 (92.91%) said leprosy can be treated by drugs. 107 (36.15%) did not want to sit with leprosy patients. Age, religion and educational status had association with knowledge of leprosy(Tesema and Beriso,2015).

In a study done to asses Performance of general health workers in leprosy control activities at public health facilities in Amhara and Oromia States, Ethiopia,a total of 601 general health workers responsible for leprosy control activities at public health facilities were included in knowledge and attitude assessment and 83 of them were subjected to practical evaluation, with on-site observation of how they handle leprosy patients . These included medical doctors (4 %), health officers and nurses with Bachelor degree in Science (27 %), clinical nurses with diploma (66 %) and health assistants (2.8 %). The median age of the respondents was 26.0 years and females made up of 45 %. Generally the knowledge and skills of the respondents were found to be poor while attitude towards leprosy was positive for the majority of the respondents. The result showed that 519 (86.3 %) had poor knowledge. Overall 155 (25.8 %) of the respondents had positive attitude towards leprosy while 205 (34.1 %) had intermediate (mixed) attitude and 241 (40.1 %) had negative attitude to the disease. Among 83 respondents assessed for diagnosis of leprosy only 15(18.0 %) diagnosed leprosy correctly(Abeje et al.,2016).

A study done on Community knowledge, perceptions and attitudes regarding leprosy in rural Cameroon, among 233 respondents about 82% of respondents had heard about, and 64.4% knew someone with leprosy. Information on leprosy was mainly from community volunteers (40.6%), friends (38.0%), and the media (24%). Only 19.7% of respondents knew the cause of leprosy, and a considerable proportion linked it to a spell (25.3%), unclean blood (15.5%) and heredity (14.6%). About 72% knew that leprosy is curable and 86.3% would advise medical treatment. Attitudes towards leprosy patients were generally negative. Only 42% would shake hands, 32.6% would share the same plate, and 28.3% and 27% respectively, would allow their child to play

or marry a person with leprosy. Further more, only 33.9% approved of participation of leprosy patients, and 42.9% of their employment(Tabah et al.,2018).

In a study done in India total of 446 participants were included in the study: 100 persons affected by leprosy, 111 close contacts, 185 community members and 50 health care workers. In addition, 24 indepth interviews were conducted and 35 people were included in focus group discussions. 12.5% of the participants had adequate knowledge of leprosy, while 22% had poor knowledge. Knowledge on cause (answered correctly by 10% of the participants), mode of transmission (5%) and symptoms of leprosy (16%) was especially poor(Van't Noordende AT et al.,2019).

A study done on community knowledge, attitude, and perceived stigma of leprosy amongst community members living in Southern Central Nepal, a total 423 individuals were interviewed and all respondents had heard about leprosy. Source of information on leprosy was mainly found to be health workers/hospitals (33.1%). Only 62.6% reported bacteria being its cause followed by other myths such as bad blood/curse/heredity/bad deeds (36%). Only 43.8% responded that leprosy is transmitted by prolonged close contact with leprosy patients and 25.7% reported religious rituals as the treatment. Only 42.1% had good knowledge and 40.9% had favorable attitude(Singh,Singh and Mahato ,2019).

A study done on Knowledge, Attitudes and Practices relating to Leprosy among Public Health Care Providers in Colombo, Sri Lanka, a total of 178 public health care workers were involved and 86% identified 'hypo pigmented patches', 36% identified 'skin nodules' and 20% identified 'thickened nerves' as suspicious signs of leprosy. More than one fifth of participants believed leprosy is easily transmitted by touch. 34.3% health care workers were scared of leprosy and 43.3% didn't want to reveal to a friend that if a family member gets leprosy. Another 27.5% didn't want to share materials with a patient. A significant minority 22.5% believed that patients should be kept apart from others.(Wijeratne and Østbye ,2017).

3.OBJECTIVES

3.1General Objectives

To assess knowledge and attitude of patients visiting ALERT hospital towards leprosy from MAY 2021 to AUGUST 2021 G.C

3.2 Specific objectives

To assess knowledge of non leprosy patients about the etiology of leprosy.

To assess knowledge of non leprosy patients on way of transmission and treatment of leprosy.

To assess attitude of non leprosy patients towards leprosy affected individuals.

4. METHODOLOGY

4.1 Study area and period

The study was conducted from May 2021- August 2021 in ALERT hospital which is located in south west of Addis Ababa, Ethiopia, specializing in leprosy. It was originally the All Africa Leprosy Rehabilitation and Training Center (ALERT) but the official name is now expanded to include tuberculosis: All Africa Leprosy and Tuberculosis Rehabilitation and Training Center. ALERT's activities focus on rehabilitation of leprosy patients, training programs for leprosy personnel from around the world and leprosy control. And currently provides a wide range of services in various departments including dermatovenerology, emergency, gynecology and obstetrics, pediatrics, ART, orthopedics, plastic surgery.

4.2 Study Design

Institution based, prospective cross sectional study design was used.

4.3 Source Population

patients seen at alert hospital, dermatology OPD.

4.4. Study Population

All patients seen at ALERT hospital dermatology clinic during study period.

4.5. Eligibility

4.5.1. Inclusion Criteria

All patients visiting dermatology outpatient department of ALERT hospital..

4.5.2 Exclusion Criteria

Patients who are on treatment and followup for leprosy and those who have previous history of treatment for leprosy.

Age <18 years of age

4.6 Sampling technique and Sample size

This is a single population proportion formula to determine the sample size.

$$N = \frac{(Z_{\alpha/2})^2 \times P(1-P)}{(d)^2}$$
 is used to estimate the sample size of clients to be interviewed.

A study done on assessment of Knowledge and Attitude of Community on Leprosy Patients in West Arsi Zone, Oromia Region Southeast Ethiopia showed 80% had low level knowledge and majority had negative attitude on leprosy.(Tesema and Beriso,2015).

P=80%

$$= \frac{(1.96)^2 \times 0.8 \times (1-0.8)}{(0.05)^2} = 236$$
 Considering 10% non-respondent rate;
total sample size is 260.

4.7 Data Collection

Data was collected from the selected study subjects using structured questionnaire that was administered by interviewers. The data collection was proceeded after a signed written consent was obtained.

4.8 Data processing and analysis

The collected data was first entered into SPSS version 25. Simple descriptive statistics and regression was implemented for data analysis using version 25 SPSS software program and results are presented using tables, graphs and interpretation.

4.9 Data quality Assurance

The completeness and consistence of the research was supervised by the principal investigator during the data collection process.

4.10 Variables

4.10.1 Dependent Variables

Knowledge and attitude of the study population regarding leprosy are the dependent variables.

4.10.2 Independent variables

Sex, age, religion, marital status, educational background, residential area and occupation are the independent variables.

4.11 Operational definitions

Knowledge is information stored in memory. Knowledge is assessed in terms of what the Person knows about leprosy and whether this knowledge is true or false.

High overall knowledge is scoring above or equal to the mean value for knowledge related questions.

Low overall knowledge is scoring below the mean value for knowledge related questions.

Attitude is the predisposition to respond in a favorable or unfavorable manner towards a target -leprosy.

Favorable attitude is scoring above or equal to the mean value for attitude related questions.

Unfavorable attitude is scoring below the mean value for attitude related questions.

4.12 Ethical Consideration

Prior to data collection ethical clearance was obtained from ethical review committee of Addis Ababa University, College of Public Health. The letter of cooperation was submitted to the clinical director of ALERT Hospital. Written informed consent was obtained from the study participants before data was collected .Information obtained from the data was only used for the purpose of this research and confidentiality was kept for all patients.

4.13 Dissemination Plan

The result of the study was submitted to AAU School of Dermatovenereology and Public health, ALERT hospital, Addis Ababa health bureau and FMOH.

5.RESULTS

5.1Socio - demographic characteristics of the participants

Two hundred sixty (260) patients participated in this study, their age ranged from 18 to 75 years with mean ($\pm$ SD) age of 46.5 ($\pm$ 40.3) and eighty seven(33.5%)are in the range of 26-35years(figure1). Majority, one hundred sixty five (63.5%) of the participants were female. One hundred seventy two (69.2%) of the patients are married and seventy seven (29.6%) of the patients are single.

Primary and secondary school were completed by seventy five (28.8%) and eighty three (31.9%) of patients respectively. Seventy three (28%)of patients completed higher education(Diploma and above). Majority of the patients, two hundred thirty three (89.6%)are urban residents.one hundred five (40.4%) of the participants are students,self or private employees,sixty one (23.5%) are government employees and fifty nine(22.7%)are house wife(Table1).

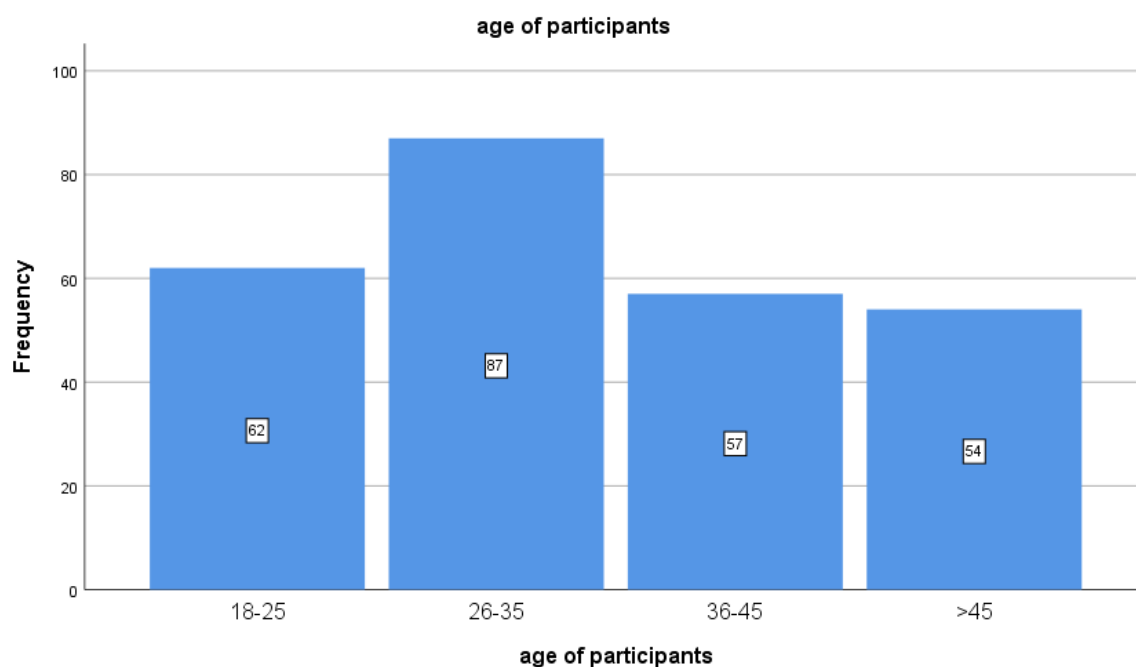


Figure 1; age frequency of participant

Table 1;Socio demographic characteristics of the study participants

Variables	Variables Category	Number / frequency	Percent
Sex	Female	165	63.5
	male	95	36.5
Age	18-25	62	23.8
	26-35	87	33.5
	36-45	57	21.9
	>45	54	20.8
Religion	Protestant	28	10.8
	Orthodox	179	68.8
	Muslim	52	20.0
	Catholic	0	0
	other	1	.4
Marital status	Single	77	29.6
	Married	172	69.2
	divorced	11	4.2
Residence	Urban	233	89.6
	Rural	27	10.4
Educational background	Non educated	29	11.2
	Primary	75	28.8
	Secondary	83	31.9
	Diploma	36	13.8
	Degree and above	37	14.2
occupation	Housewife	59	22.7
	Government employee	61	23.5
	Merchant	16	6.2
	Farmer	19	7.3
	other	105	40.4

5.2. Knowledge of the participants about Leprosy

Out of the 260 study participants, 249 (95.7%) of them had heard about leprosy. The remaining 11 (4.2%) study participants who had no information about leprosy were excluded from the analysis. For those who had heard of leprosy, their main sources of information were mainly mass media 128 (51.4%) and friends 73 (29.3%). Less than one-fourth (24.1%) of the participants stated that bacteria was the causative agent of leprosy and 87 (34.9%) of them considered leprosy a hereditary disease. Slightly higher than one in four (26.1%) of study participants reported that they don't know the cause and 13 (5.2%) perceived that it is due to curse by God (figure 2).

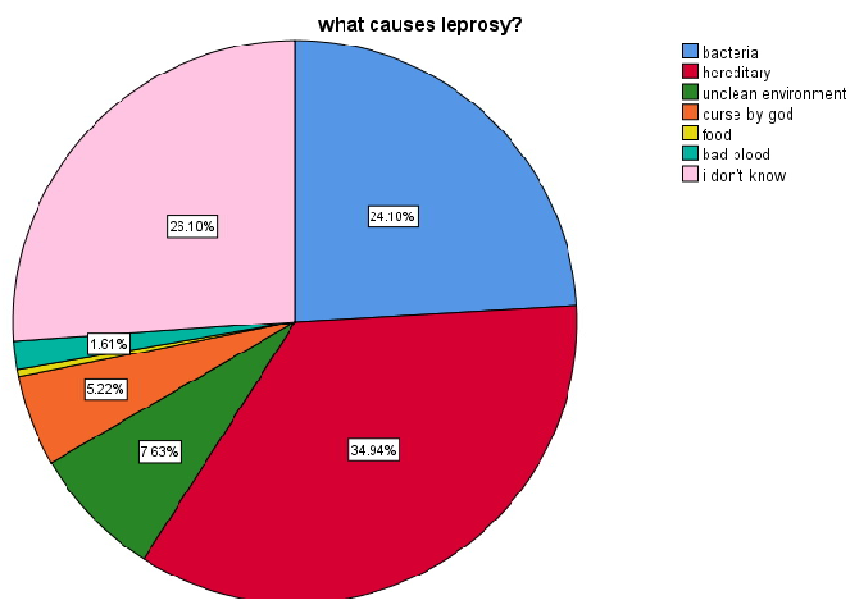


Figure 2; response of participants on the cause of leprosy

Concerning the leprosy cardinal symptoms, 106 (42.8%) and 53 (21.3%) of them reported that leprosy causes deformities and disfigurement and skin patches together with deformities and disfigurement (figure 3).

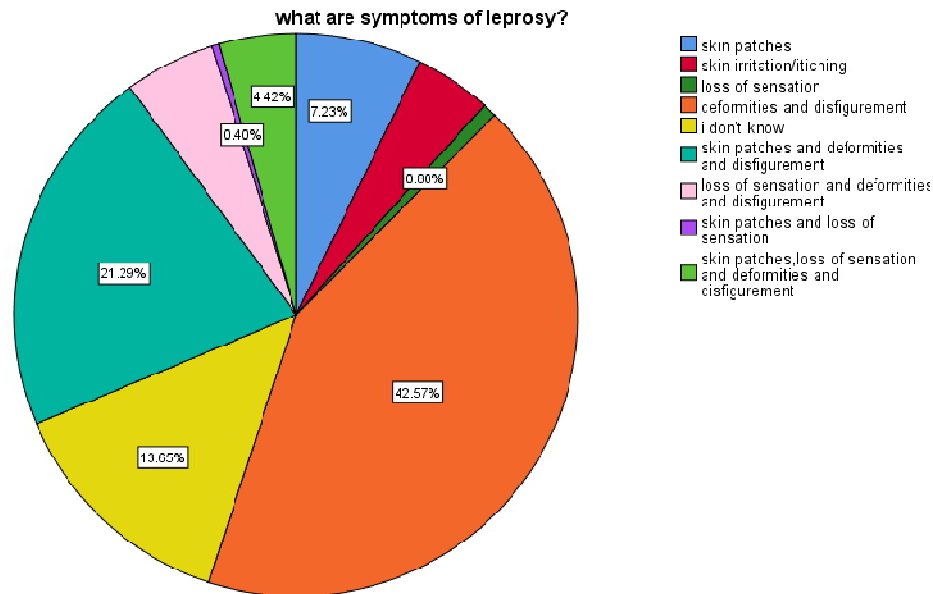


Figure 3; participants response on symptoms of leprosy

Prolonged contact with leprosy patients was stated as the main route of transmission by seventeen (6.8%) of study participants. Among the study participants who had heard about leprosy, only 7 (2.8%) of them accurately responded that leprosy can be transmitted through aerosol droplets from patients. Less than half (41.0%) of the participants didn't know the means of transmission and sixty five (26.1%) said due to causal contact (figure 4). The majority, 218 (87.6%), of the study participants responded that leprosy is a curable disease and most, 215 (86.3%), of them suggested that leprosy can be cured by modern medicine (Table 2).

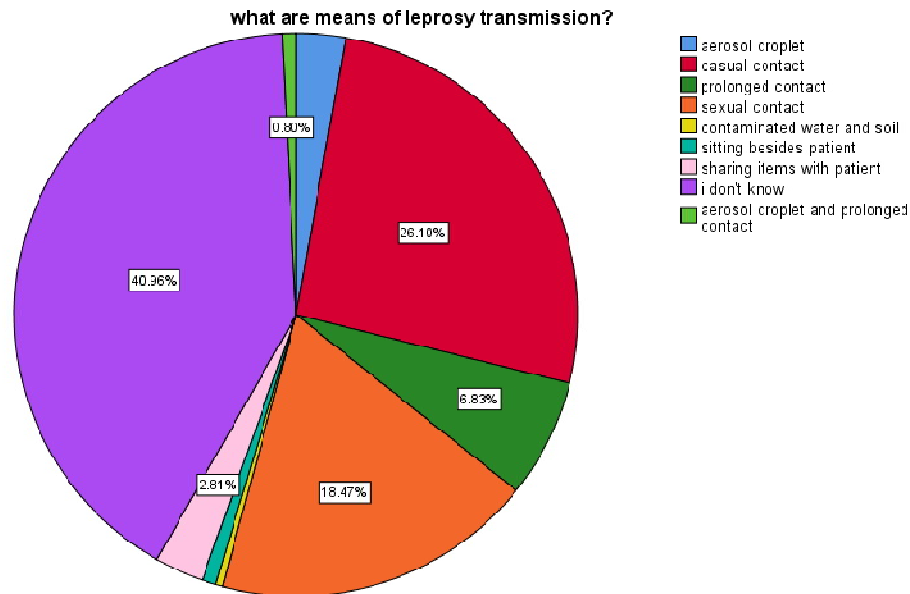


Figure 4; participants response on means of leprosy transmission

The overall knowledge of leprosy was assessed using a scoring system. A score of 1 was given to correct responses, and 0 was used for incorrect/do not know responses. A sum score was constructed by adding the items corresponding to each variable and a mean value was used to categorize the study participants into two categories. Accordingly, those who scored above or equal to the mean value were considered as having high overall knowledge, while those who scored below the mean were considered as having low overall knowledge. In this study, knowledge scores of the participants ranged from 2 to 13 and the mean ($\pm$ SD) knowledge score was 7.5 ± 7.8 . Overall, only 25 (10.0%) of the participants had a high level of knowledge regarding leprosy. In a Binary logistic regression analysis, study participants who completed grade 1–8 (AOR=0.117, 95% CI=0.025–0.557, $P=0.007$), who completed secondary school (AOR=0.098, 95% CI=0.021–0.452, $P=0.003$) and Diploma and above (AOR=0.199, 95% CI=0.49–0.802, $P=0.023$) were significantly associated with high level of knowledge of leprosy. (Table 3).

Table 2; knowledge of leprosy among the study participants

Knowledge related questions	Response	Frequency	Percentage
Have you heard about leprosy?	Yes	249	95.8
	No	11	4.2
Where did you hear?	Mass media	128	51.4
	Health worker	21	8.4
	Family	17	6.8
	Friends	73	29.3
	Formal school	6	2.4
	Do not remember	4	1.6
What causes leprosy?	Bacteria	60	24.1
	Hereditary	87	34.9
	Unclean environment	19	7.6
	Curse by god	13	5.2
	Punishment for sins of family	0	0
	Immoral conduct	0	0
	Food	1	0.4
	Bad blood	4	1.6
	I don't know	65	26.1
What is/ are symptoms of leprosy?	Skin patches	18	7.2
	Skin irritation/ itching	11	4.4
	Loss of sensation	2	.8
	Deformities &disfigurement	106	42.8
	Always deformities	0	0
	Skin patches and deformities and disfigurement	53	21.3
	Loss of sensation and deformitiesand disfigurement	13	5.2
	Skin patches and loss of sensation	1	.4
	Skinpatches ,loss of sensation &deformities disfigurement	11	4.4
	I don't know	34	13.7
What is/are means of leprosy transmission?	Aerosol droplet	7	2.8
	Casual contact	65	26.1
	Prolonged contact	17	6.8
	Sexual contact	46	18.5
	Contaminated water and soil	1	.4
	Sitting besides patient	2	.8
	Sharing items with patient	7	2.8
	Aerosol &Prolonged contact	2	.8
	I don't know	102	41.0
Is leprosy curable?	Yes	218	87.6
	No	14	5.6
	I don't know	17	6.8
What is/are treatment of leprosy?	Pharmaceutical treatment	215	86.3
	Traditional treatment	2	.8
	Religious rituals	5	2.0
	I don't know	27	10.8

5.3Attitude toward leprosy

Among the study participants who had heard about leprosy, 49 (19.7%) believed that it was shameful to share public transport with leprosy patients.112(45%) of the study participants would allow their children to marry someone from a family who had a

history of leprosy. More than half, 164 (65.9%), of the study participants would allow their children to play with children from a family who had a history of leprosy. More than two third, 199 (79.9%), of the participants would feel innocent to work with some one who have leprosy in the same environment; and about 9(3.6%) of them would feel ashamed to have someone with leprosy in their family. More than half, 156 (62.7%), of study participants would allow sharing dishes/plates with leprosy patients (Table 4).

Table 3; Association and Binary Logistic regression between knowledge of leprosy and socio demographic characteristics of the study participants

Variables	Category	Overall Knowledge Regarding Leprosy					
		low	high	P value	COR(95%CI)	P value	AOR(95%CI)
Sex	Female	145	12	0.105	1.988(0.866-4.565)	0.790	0.862(0.287-2.582)
	male	79	13				
Age	18-25	51	3	0.279	0.451(0.107-1.907)	0.066	0.129(0.015-1.144)
	26-35	77	9	0.844	0.896(0.300-2.680)	0.416	0.529(0.113-2.482)
	36-45	50	7	0.905	1.073(0.336-3.429)	0.947	0.954(0.236-3.849)
	>45	46	6				
Religion	Protestant	20	5	1.000	.000	0.999	.000
	Orthodox	157	17	1.000	.000	0.999	.000
	Muslim	47	2	1.000	.000	0.999	.000
	Catholic	0	0				
	other	0	1				
Marital status	Single	61	10	0.999	264832207(.000	0.999	.000
	Married	152	15	0.999	1594220196(.000	0.999	.000
	divorced	11	0				
Residence	Urban	202	21	0.358	0.383(0.049-2.966)	0.998	.000(.000)
	Rural	22	4				
Educational background	Non educated	26	1	0.016	0.074(0.009-0.612)	0.153	0.154(0.12-2.005)
	Primary	66	4	0.001	0.116(0.034-0.396)	0.007	0.117(0.025-0.557)*
	Secondary	79	3	0.000	0.073(0.019-0.280)	0.003	0.098(0.021-0.452)*
	Diploma	30	5	0.057	0.319(0.099-1.036)	0.023	0.199(0.49-0.802)*
	Degree and above	23	12				
occupation	Housewife	57	1	0.052	0.129(0.016-1.017)	0.141	0.167(0.015-1.812)

	Government employee	48	11	0.253	1.681(0.690-4.095)	0.504	0.651(0.185-2.293)
	Merchant	15	1	0.507	0.489(0.059-4.041)	0.847	0.797(0.079-8.022)
	Farmer	16	0	0.998	0.000(.000	0.998	.000(000
	other	88	12				1

Attitudes regarding leprosy were assessed using a scoring system. A score of 1 was given to correct responses, and 0 was used for incorrect responses. A sum score was constructed by adding the items corresponding to each variable and a mean value was used to categorize the study participants into two categories. Accordingly, those who scored above or equal to the mean value were considered as having favorable attitude, while those who scored below the mean value were considered as having unfavorable attitude. In this study, attitude scores of the respondents ranged from 1 to 8 and the mean ($\pm$ SD) attitude score was 4.5 ± 4.9 . Among 249 study participants who had heard of leprosy, 183 (73.5%) had a favorable attitude toward the disease. Study participants who are in age range between 18-25 (AOR=0.192, 95%CI=0.054-0.685, P=0.011), not educated (AOR=0.218, 95%CI=0.049-0.963, P=0.044), completed grade 1–8 (AOR=0.171, 95% CI=0.052–0.555, P= 0.003) and those who are house wives (AOR=2.901, 95%CI=1.0058.370, P=0.049) and farmers (AOR=16.28.95%CI=2.507105.72, P=0.003) were significantly associated with favorable attitude toward leprosy. Having high knowledge of leprosy was not associated with favorable attitudes toward leprosy.

Table 4; Attitude toward leprosy of study participants

Attitude related questions	Response			
	yes		No	
	frequency	percent	frequency	Percent
Would you admit sitting besides a leprosy patient in public?	200	80.3	49	19.7
Would you be ashamed if someone has leprosy in your family?	9	3.6	240	96.4
Would you share a plate with a leprosy patient?	156	62.7	93	37.3
Would you admit owing your family to marry someone from a family with leprosy?	112	45.0	137	55.0
Would you be ashamed to work with leprosy patient?	50	20.1	199	79.9
Would you allow your child to play with a child from a family with leprosy?	164	65.9	85	34.1
Would you help someone if they get leprosy in your family?	247	99.2	2	.8
Would you share items with a leprosy patient?	132	53.0	117	47.0

Table 5; Association and Binary Logistic regression between attitude toward leprosy and socio demographic characteristics and knowledge of the study participants

Variables	Category	Over all attitude regarding Leprosy					
		Unfavorable	Favorable	P value	COR(95%CI)	P value	AOR(95%CI)
Sex	Female	34	123	0.025	0.518(0.292-0.919)	0.061	0.485(0.228-1.033)
	male	32	60				
Age	18-25	18	36	0.618	0.811(0.355-1.850)	0.011	0.192(0.054-0.685)
	26-35	18	68	0.292	1.532(0.693-3.387)	0.615	0.775(0.285-2.096)
	36-45	15	42	0.768	1.135(0.490-2.632)	0.720	0.836(0.315-2.218)
	>45	15	37				
Religion	Protestant	6	19	1.000	.000(.000)	1.000	.000(.000)
	Orthodox	46	128	1.000	.000(.000)	1.000	.000(.000)
	Muslim	14	35	1.000	.000(.000)	1.000	.000(.000)
	Catholic other	0	1				
Marital status	Single	16	55	0.746	0.764(0.150-3.900)	0.493	1.957(0.287-13.365)
	Married	48	119	0.456	0.551(0.115-2.644)	0.370	0.447(0.077-2.602)
	divorced	2	9				
Residence	Urban	58	168	0.348	0.647(0.261-1.606)	0.089	0.344(0.101-1.176)
	Rural	8	15				
Educational background	Non educated	8	19	0.382	0.594(0.184-1.913)	0.044	0.218(0.049-0.963)
	Primary	27	43	0.060	0.398(0.153-1.038)	0.003	0.171(0.052-0.555)
	Secondary	15	67	0.829	1.117(0.411-3.035)	0.736	0.824(0.268-2.532)
	Diploma	9	26	0.570	0.722(0.235-2.220)	0.410	0.603(0.181-2.011)
	Degree and above	7	28				
Occupation	Housewife	12	46	0.101	1.888(0.883-4.037)	0.049	2.901(1.005-8.370)
	Government employee	16	43	0.438	1.324(0.651-2.691)	0.531	0.716(0.323-1.790)
	Merchant	3	13	0.261	2.134(0.569-8.012)	0.053	4.236(0.982-18.274)
	Farmer	2	14	0.115	3.448(0.740-16.068)	0.003	16.280(2.507-105.715)
	other	33	67				
Knowledge	High	4	21	0.217	2.009(0.663-6.088)	0.290	1.963(0.563-6.848)
	low	62	162				

6. Discussion

This study was conducted to assess the level of knowledge and attitude toward leprosy among non leprosy patients visiting ALERT Hospital Addis Ababa, Ethiopia. This study found that 10% and 73.5% of the participants had a high level of knowledge and favorable attitude toward leprosy, respectively. Having a high overall knowledge level on leprosy was not shown to support a favorable attitude toward leprosy.

The findings of this study show that only one in ten of the study participants were knowledgeable about leprosy. This is not comparable with the findings from previous studies conducted in Ethiopia in which 56.9% and 19.3% of study participants had high overall knowledge about leprosy (Urgesa et al., 2020; Tesema and Beriso, 2015).

A study conducted in Nepal revealed that 42.1% of the community had good knowledge of leprosy (Singh, Singh and Mahato, 2019). Another study done in India showed that 12.5% of participants had a good quality of knowledge regarding leprosy which is comparable to this study (Van't Noordende AT et al., 2019). This disagreement could be attributed to the difference in the leprosy burden or effectiveness of the leprosy control program among the regions and countries, where individuals with a high leprosy prevalence area showed a better knowledge than those from low prevalence area (Urgesa et al., 2020; Tesema and Beriso, 2015). The use of the different sources of information may also generate different levels of individuals' knowledge of leprosy.

Although the majority of the respondents (95.8%) had heard of the disease, only one in four (24%) mentioned bacteria as a cause, and this result is lower than previously done studies in Ethiopia in which 30.92% and 48.31% mentioned bacteria as a cause (Urgesa et al., 2020; Tesema and Beriso, 2015) and in Nepal 62.6% said bacteria is the cause (Singh, Singh and Mahato, 2019). In this study majority, 73.9%, of the respondents knew that leprosy can lead to deformities and disfigurements and 33.2% said that leprosy can present as skin patch and 10.8% responded presence of loss of sensation as a sign and symptoms of leprosy respectively. This is different from study done in eastern Ethiopia in which 50.99% responded white patches, 43.59% reported

numbness and 16.78% deformity and disfigurement as a sign and symptoms of leprosy(Urgesa et al.,2020). Study in Nepal indicated that 62.2% of the community responded skin patch, 48.9% of the respondents reported loss of sensation and 30% deformity and 66.7% ulcer(Singh,Singh and Mahato ,2019).In this study only 11.6% of the participants responded that leprosy is transmitted by aerosol droplets and prolonged contact with untreated patients and this is much higher than study done in India were only 2% responded by aerosol droplets(Van't Noordende AT et al.,2019), but lower than studies done in other parts of Ethiopia,by prolonged contact 36.35% and by aerosol 37.1%(Urgesa et al.,2020) and by prolonged contact with untreated person 46.62%(Tesema and Beriso,2015)and in study done in Nepal participants responded by prolonged contact in 43.8%(Singh,Singh and Mahato ,2019).

In this study 87.6% of the participants knew that leprosy can be treated. Of these participants, 86.3% knew that leprosy can be treated by pharmaceutical or modern medication. This is higher than in other study done in eastern Ethiopia, which reported 77.63% said it is treatable and 90.46% treatment by modern medicine(Urgesa et al.,2020),but lower than study done in southeast Ethiopia and India which showed 92.89% and 93% said leprosy is treatable and 90% and 97% by modern medication(Tesema and Beriso,2015;Van't Noordende AT et al.,2019).

Even though slightly less than three fourth(73.5%)of the participants had a favorable attitude toward leprosy,this is not comparable in previous studies done in Ethiopia(40.79%)(Urgesa et al.,2020) and Nepal(45.3%)(Singh,Singh and Mahato ,2019).In this study more than half(55%)of the study participants favored restricting their children from marrying someone who had a family history of leprosy and this is in agreement with a studies conducted in eastern and south eastern Ethiopia,even though the results were higher(which showed majority of the participants had unfavorable attitude in the previous studies),in which(77.47% and 51%)did not allow marriage(Urgesa et al.,2020 ;Tesema and Beriso,2015),and in this study more than half of the participants(53%)were willing to share items with leprosy patients, around two third(65.9%) allow their children to play with a child from a leprosy family,less than two third (62.7%) were willing to share a plate with a leprosy patient and all most all 96.4% and 99.2% wont get ashamed if someone has leprosy in their family and will help if someone develops leprosy in their family respectively.

But in other studies done in Ethiopia majority of the participants(55.3% and 96.62%)did not want to share items,did not allow their children to play with a child from a leprosy family(68.59%and32.7%) and (45.72% and85.8%) did not want to share same plate with a leprosy patient and more than half(65.79% and59.8%) will be ashamed if someone has leprosy in their family.(Urgesa et al.,2020 ;Tesema and Beriso,2015).

In this study,even though majority of the participants with high overall knowledge have favorable attitude, having a high level of knowledge was not associated with a favorable attitude toward leprosy ($P= 0.290$). This is not supported by a study conducted in eastern Ethiopia and India, which indicate the existence of a strong positive correlation between the knowledge and attitudes of the community toward leprosy patients($p=0.001$)(Urgesa et al.,2020;Van't Noordende AT et al.,2019).This unexpected finding might show that information, education, and communications conveyed through mass media that influence attitudes positively might be minimal, unlike information from experts.

In this study, educational status was significantly associated with the level of participants knowledge and attitude toward leprosy($p=0.003$ and 0.023 for primary & secondary and diploma level respectively). This finding is in harmony with the study done in other parts of Ethiopia, which revealed that educational status was significantly associated with the knowledge and attitude toward leprosy among the general community (<0.05)(Urgesa et al.,2020 ;Tesema and Beriso,2015).A study from Nepal also reported that respondents with higher educational status were shown to have a good knowledge and attitude of leprosy ($P< 0.001$)(Singh,Singh and Mahato ,2019). Therefore, it is essential to convey knowledge of leprosy among the community through an educational intervention that would bring updated knowledge and methods of leprosy control.

7.Limitations,Conclusion and Recommendation

7.1.Limitations

The study is conducted in ALERT with limited number of participants and time, it might not be representative of the whole community. Therefore,further studies that include people affected by leprosy and health professionals working on the leprosy control program are required.

7.2.Conclusion

Although more than half of the study participants had favorable attitude, only one out of ten participants had high level of knowledge of leprosy, with a significant proportion still perceiving leprosy as a hereditary disease. Having at least primary education was found to be associated with having high overall knowledge and a favorable attitude.

7.3.Recommendation

- ✓ Knowledge gap among community regarding leprosy cause and transmission should be addressed through health education
- ✓ As the media remains to be the major sources of information about the disease, transmitting more reliable information about leprosy by experts is also essential. These can improve knowledge, attitude and health-seeking behavior of the community and early case detection rate.
- ✓ Furthermore, filling the community knowledge gaps through education can reduce their misconceptions and positively influence the perception of leprosy,since educational background has significant association.

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9. Annex

Consent form

Name of study- Knowledge and Attitude towards leprosy among patients visiting ALERT Hospital.

After the purpose and nature of the study is explained to me by the investigator who is a doctor at ALERT Hospital.

I understand that,

1. I am participating voluntarily.
2. This study is assessing the knowledge and attitude of patients toward leprosy.
3. I will be required to fill a questionnaire that assesses my knowledge and attitude towards leprosy.
4. I have received enough information about this study and had an opportunity to discuss this study and ask questions about it. And my questions have been answered to my satisfaction.
5. I have freely consented to participate in this study.

Signature_____

Date_____

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የጥናቱ አላማ የአለርት ሆስፒታል ሐኪም በሆነው የጥናቱ አጥኝ በግልጽ ተብራርቶልኛል፤ በጥናቱ በፍቃደኝነት እንድሳተፍ በነጻነት ተጠይቄያለሁ፤ ስጋቶቼና ጥቅሞቼም በበቂ ሁኔታ ተብራርተዋል፤ ስለጥናቱ በቂ መረጃ በሚገባኝ ቋንቋ አግኝቻለሁ፡፡ ስለዚህ በጥናቱ ለመሳተፍ ተስማምቻለሁ፡፡

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Questionnaire
Addis Ababa University
College of Health Sciences
Department of Dermatovenereology

A **questionnaire** prepared to assess knowledge and attitude towards leprosy among patients visiting ALERT hospital.

I. General Information

Variables	Category
Sex	Female male
Age	18-25 26-35 36-45 >45
Religion	Protestant Orthodox Muslim Catholic other
Marital status	Single Married divorced
Residence	Urban Rural
Educational background	Non educated Primary Secondary Diploma Degree and above
occupation	Housewife Government employee Merchant Farmer other

II. Items related to knowledge towards leprosy

Knowledge related questions	Response
Have you heard about leprosy?	Yes No
Where did you hear?	Mass media Health worker Family Friends Do not remember
What causes leprosy?	Bacteria Hereditary Unclean environment Curse by god Punishment for sins of family Immoral conduct Food Bad blood I don't know
What is/ are symptoms of leprosy?	Skin patches Skin irritation/ itching Loss of sensation Deformities and disfigurement Always deformities I don't know
What is/are means of leprosy transmission?	Aerosol droplet Casual contact Prolonged contact Sexual contact Contaminated water and soil Sitting besides patient Sharing items with patient I don't know
Is leprosy curable?	Yes No I don't know
What is/are treatment of leprosy?	Pharmaceutical treatment Traditional treatment Religious rituals I don't know

III.Items related to attitude toward leprosy

Attitude related questions	Response
Would you admit sitting besides a leprosy patient in public?	Yes No
Would you be ashamed if someone has leprosy in your family?	Yes No
Would you share a plate with a leprosy patient?	Yes No
Would you admit owing your family to marry someone from a family with leprosy?	Yes No
Would you be ashamed to work with leprosy patient?	Yes No
Would you allow your child to play with a child from a family with leprosy?	Yes No
Would you help someone if they get leprosy in your family?	Yes No
Would you share items with a leprosy patient?	Yes No