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Research

Pulmonary Tuberculosis Prevalence and Associated Factors Among Adult Patients Visiting Finchwa Health Center, West Guji Zone, Southern Ethiopia

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Abstract

Background: Mycobacterium tuberculosis is the name of the microorganism that causes tuberculosis. The bacteria typically affect the lungs, but if not adequately treated, it can affect any part of the body, such as the kidney, spine, and brain. In Ethiopia, tuberculosis is a significant public health issue. However, no epidemiological research in the study area has been recorded.

Objective: The study was undertaken to assess the prevalence of pulmonary tuberculosis and associated risk factors PTB presumptive patients who visited the Finchawa Health Center from November 2022 to February 2023.

Methods: A cross-sectional study was conducted among 273 study participants. Structured questionnaire was used to gather sociodemographic and risk factor information. Sputum samples were taken from the study participants and analyzed under a microscope. Data were analyzed by using SPSS Version-25 software. Binary logistic regression analysis adjusted odds ratio (AOR) with respective 95% confidence interval (CI) and the threshold for statistical significance was set at p 0.05.

Result: The prevalence of smear-positive Tb among presumptive patients was 4.8% with 95% CI (2.24–7.29). Prevalence of PTB with HIV co-infections, and PTB with diabetes mellitus (DM) comorbidity were 38.5%, and 27.3%, respectively. In comparison to their counterparts, having a family size greater than five (AOR = 5.15, 95% CI. = 1.46-18.29), having a history of family contact (AOR = 6.7, 95% CI. = 1.78-22.99) and having a history of Tb infection (AOR = 4.76, 95% CI. I = 1.05-21.62) were all found to be predictors for developing smear-positive pulmonary tuberculosis.

Conclusion: The prevalence of smear-positive pulmonary tuberculosis in the Finchawa health center was found to be high. Therefore, zonal and town health departments should emphasize detailed tracing of presumptive, regular assessment of PTB suspects and refer to public health care institutions for early diagnosis and initiation of anti-TB treatment.

Keywords: *Finchawa Health Center, Presumptive patients, Pulmonary Tuberculosis, West Guji Zone, Southern Ethiopia*

Introduction

An infectious bacterial illness of the lungs, pulmonary tuberculosis (TB) affects the lungs. It could spread to different organs. *Mycobacterium tuberculosis* is the cause of pulmonary tuberculosis. Although they can affect any part of the body, bacteria typically attack the lung. When pulmonary tuberculosis (TB) is not appropriately treated, a considerable portion of patients present at extra pulmonary locations, such as the kidney, spine, and brain [1-3].

Consequently, people with tuberculosis can have a wide range of symptoms. Different types of tuberculosis, such as lymph node TB, bone and joint TB, disseminated TB, central nervous system TB, pericardial TB and respiratory tuberculosis, can have different symptoms. For instance, respiratory tuberculosis patients may have symptoms such as cough and pleurisy chest pain, and in advanced cases, breathlessness and systemic symptoms such as malaise, weight loss fever and night sweats are common [4].

The most frequent infectious pathogen-related cause of death in 2019 was still tuberculosis (TB). Globally, it is anticipated that 10.0 million people acquired TB disease in 2019, and that 1.2 million HIV-negative people and an additional 208,000 people living with HIV died from the disease. 88% of all TB patients were adults, and 12% were children under the age of 15 [5]. In 2019, the number of tuberculosis cases in the African region was predicted to be 2.5 million, or 25% of the global burden. This illness claims more than 500,000 lives in Africa every year [6].

Tuberculosis is still a significant public health issue in Ethiopia. The country is one of the 30 nations with the greatest TB incidence, with a mortality rate of 21 per 100,000 people in 2019 and an estimated income rate of 140 per 100,000 for tuberculosis. 111,039 cases of tuberculosis were reported in the nation that same year [7]. The fatality rate was 22 per 100,000 people in Ethiopia,, according to the 2019 WHO global TB report. However, the global treatment coverage rate for tuberculosis in 2018 was only 69%, meaning that more than one-third of patients went untreated [1].

Latent TB, which means that people have been infected by the TB bacteria but appear healthy and cannot spread the disease, affects about 25% of the world's population [4]. The majority of persons with tuberculosis are in their prime working years. All age groups, however, are at danger [8]. TB skin tests and TB blood tests, both of which are used to find TB germs in the body, are used to diagnose pulmonary tuberculosis (TB) [9].

A vaccination called BCG (bacilli Chalmette-Guerin) is used to prevent TB in order to reduce the degree of mortality and morbidity brought on by pulmonary tuberculosis preventive care [10]. It works better on kids, and it works inconsistently on adults. Other preventative measures, such as wearing a mask if a family member is known to be infected at home, keeping separate utensils and rooms, keeping the most vulnerable people away from the infected person, avoiding large gatherings, regularly washing hands or sanitizing when outside the house, keeping the house sufficiently ventilated, and cleaning AC ducts of both car and home are advised [11].

In general, it is possible to conclude that TB is one of the leading causes of morbidity and mortality in Ethiopia, including the study area. In the west Guji zone, no study has been conducted, and little is known about the topic. Therefore, this study aims to assess the prevalence of pulmonary tuberculosis and identify significant factors associated with it in the Finchawa Health Centre, West Guji Zone, southern Ethiopia.

Methods and Materials

Study Setting and Period

The study was conducted in the Finchawa Health Centre in Finchawa Town, west Guji Zone, Oromia region, southern Ethiopia, which is 506 km from Addis Ababa and 275 km north of Moyale. It has a total population of 12,829 and 2,873 households. The town has two kebeles, namely, the Kilta Misoma and Meda Finchawa kebeles. Finchawa town has 1 preparatory school, 1 high school, 3 elementary schools, 1 health centre, 2 health posts, 2 mosques, and 10 churches. Finchawa Health Centre is a governmental health institution that provides emergency service, maternal and child health, under-5 OPD, adult OPD, immunisation service, laboratory, ART, TB clinic, and other services. It provides services for 12,829 people and has 11 health professionals, 27 health extension workers, and 9 supportive workers. The study was conducted from November 2022 to February 2023.

Study design and population

A cross-sectional study was conducted to assess the prevalence of pulmonary tuberculosis and associated factors in adults at the Finchawa Health Center, West Guji, southern Ethiopia, in 2023. All adult patients who were suspected of pulmonary tuberculosis were tested at the Finchawa Health Center, southern Ethiopia, during the study period were study populations.

Eligibility criteria

All presumptive adult patients who voluntarily participated in this study were included. The individuals less than 15 years old, mentally ill patient, patients who started treatment and follow-up were excluded from study.

Sample Size and Sampling technique

The sample size was determined by using a single population proportion formula by considering the following assumptions: proportion of patients who were exposed to pulmonary tuberculosis, taken from a previous study performed in Addis Ababa health centres, Ethiopia, with p = 21.3% [12], 95% confidence interval of 1.96, and margins of error of 5% and 10% nonresponse rates.

$$n=\frac{Z^2_{\alpha/2}\,P(1-p)}{d^2}=\frac{(1.96)^2\,(0.213)(0.787)}{(0.05)^2}$$ =257 with 10% nonresponse rate the final sample size was 283.

Where, P=prevalence (21.3%) from a previous study performed in Addis Ababa health centers, Ethiopia, n= sample size, z=95% confidence interval, d=degree of margin errors

A consecutive sampling technique was employed to select study participants from the Pulmonary Tuberculosis Suspect Adult Individual Visiting Finchawa Health Center.

Data collection Method

Data collection procedures

The study populations are suspected tuberculosis patients who come to the Finchawa health centre. Data were collected using an interviewer-administered structured questionnaire that was developed from different studies and contains sociodemographic-related factors, health-related factors, and tuberculosis history-related factors. An appropriate modification of the data collection form concerning this study was made after pretested the questionnaire. It was prepared in English and translated into the Afaan Oromo language. The data were collected by three health professionals with a diploma and supervised by three health professionals working in health institutions. The data were collected by interviewing suspected tuberculosis patients who fulfilled the inclusion criteria (S1 file).

In addition, data collectors were trained for one day by the principal investigators on the objectives of the study, the selection of study participants, how to keep information confidential, the contents of the questionnaire, how to fill in the data collection format, and data quality management. The principal investigators and supervisors will conduct day-to-day follow-up during the whole period of data collection. Every day, after data collection, each questionnaire was reviewed and checked for completeness by the supervisors and the principal investigator so that the necessary feedback could be given to the data collectors the next day. The overall activity was supervised by the principal investigators of the study.

Laboratory examinations

A smear from a sputum sample was formed on fresh, clean frosted slides, stained with auramine O stain (0.1 percent auramine O, 0.5 percent acid alcohol, and 0.5 percent potassium permanganate), and analysed using the LED-FM (Primo Star iLED, Carl Zeiss Micro Imaging, Göttingen, Germany).

Operational definition

- Sputum smear positive: the presence of at least one acid-fast bacillus (AFB+) in at least one sputum sample [13].
- Sputum smear negative: absence of AFB in at least two sputum smear examinations [13].
- PTB presumptive: a patient who presents with symptoms or signs suggestive of TB [13].

Data quality control

Data quality was ensured by caring for the careful design of structured questionnaires, appropriate modifications, appropriate recruitment, and adequate training and follow-up for data collectors and supervisors. The data collection instrument was pretested for its relevance and clarity to address the research problems appropriately and corrected prior to the actual data collection period. Therefore, a pretest was conducted at the nearby health centre with 5% of the total sample and respondents who were characteristically similar to the study participants.

Intensive supervision was performed by principal investigators and supervisors during the whole period of data collection. The was interviewed by the principal investigators to confirm the reliability of the data before data collection, and the investigators also randomly cross-checked their accuracy and consistency at the end of each day. A corrective discussion was undertaken with all the research team members.

The data was checked for completeness and consistency and then coded, entered, and stored on the computer using Epi-data Manager v.4.2.2.1.

Data processing and analysis

Data were cleaned, coded, and entered into SPSS version 26 statistical software for entry and analysis. Descriptive statistics were used to assess basic client characteristics. Bivariate analysis using the binary logistic regression technique was performed to determine the crude association between the independent variables and the dependent variable. Factors that showed an association in bivariate analysis and that had a P value less than 0.25 were entered into multivariable binary logistic regression models to control confounding factors and identify significant factors. Additionally, biological plausibility and previous research were considered. The strength of the statistical association was measured by adjusted odds ratios and 95% confidence intervals, and a P value less than 0.05 was considered significant. The fitness of the model was checked by the Hosmer and Lemeshow test.

Ethical Approval and Consent To Participate

Ethical approval was obtained from Bule Hora University Institutional Review Committee (BHUIRC/2022) and support letters were given to Finchawa Health Center administration before data collection for permission. After the purpose and objective of the study were informed, verbal consent was obtained from study participants to ensure their voluntariness to participate in the study, and they were told that all had a right to withdraw at any time if they were not comfortable to participate in the study or to put an end for a single question, segment of questions or refusal to participate. Parents/care givers' permission was also obtained for participants 15-18 years old. To keep confidentiality of any information provided by study subjects, the data collection procedure was maintained by excluding their names of the respondents, their addresses, telephone number, the names of the providers or anything related to the study. Moreover, confidentiality of the information was assured by using anonymous questionnaires and keeping the data in a secure place.

Result

Sociodemographic characteristics of respondents

During our study period, 273 participants completed our study, with a 96.4% response rate. A total of 158 (57.9%) were male, while 115 (42.1%) were female. The mean age of the study participants was 36.02 (± 13.88) SD years. More than half (184, 67.4%) of the respondents were married. One hundred sixty-three (59.7%) participants were rural residents, while 44.6% were farmers by occupation. The average participant family size was 4.94, and they had an average of 2.94 living rooms, 258 (94.5%) of them having rooms windows. Forty-eight (17.4%) of the respondents had a history of alcoholism, and 251 (91.5%) had a history of consuming any type of raw milk (Table 1).

Table 1: Sociodemographic characteristics of the patients who visited the Finchawa Health Center, West Guji Zone, southern Ethiopia, from November 2022 to February 2023.

Variables	Category	Frequency	Percent (%)
Sex	Male	144	52.7
	Female	129	47.3
Age	15-24	78	28.6
	25-34	71	26.0
	35-44	52	19.0
	>=45	72	26.4
Residence	Rural	163	59.7
	Urban	110	40.3
Marital status	Single	86	31.5
	Married	184	67.4
	Divorced	3	1.1
	Widowed	0	0.0
Education status	No formal	41	15.0
	Primary	50	18.3
	Secondary	109	39.9
	Diploma and above	73	26.7

Table continued....

Variables	Category	Frequency	Percent (%)
Occupation	Farmer	89	32.6
	Student	119	43.6
	Employer	27	9.9
	Housewife	1	0.4
	Merchant	37	13.6
	Other	0	0.0
Family size	<=5	189	69.2
	>5	84	30.8
Weight	35-45Kg	77	28.2
	46-55Kg	145	53.1
	>=56	51	18.7

Clinical profile, individual characteristics and contact history of respondents

Of a total of 273 participants, 13 (4.8%) were infected with HIV/AIDS, and 11 (4%) had comorbid diabetes mellitus (DM). Regarding individual factors, 239 (87.5%) had heard about tuberculosis, and 222 (81.3%) knew it was a transmittable disease. A total of 24 (8.8%) had a history of tuberculosis infection during the previous two years, and 32 (11.72%) also had a family contact history (Table 2).

Table 2: Contact history, clinical profile, knowledge, alcohol and raw milk consumption of patients visited Finchawa Health Center, West Guji Zone, and southern Ethiopia, 2023.

Characteristics	Category	Frequency	Percent (%)
Contact history	Yes	32	11.7
	No	241	88.3
Alcohol intake	Yes	48	17.6
	No	225	82.4
Raw milk consumption	Yes	251	91.9
	No	22	8.1
HIV status	Yes	13	4.8
	No	260	95.2
DM status	Yes	11	4
	No	262	96
Tb infection history	Yes	24	8.8
	No	249	91.2
Heard about Tb	Yes	239	87.5
	No	34	12.5
Transmittable knowledge	Yes	222	81.3
	No	51	18.7

Prevalence of Smear-Positive Pulmonary Tuberculosis

In the current study, the prevalence of smear-positive pulmonary tuberculosis among 273 study subjects was 13 (4.8%) with 95% confidence interval (2.24–7.29) by the Auramine O fluorescence staining technique. The prevalence of smear-positive PTB was 4,800 per 100,000 among presumptive patients.

Smear-positive status of TB among sociodemographic characteristics of the patients

Of total positives, 7 (53.8%) and 6 (46.2%) were males and females, respectively. The majority of smear positives, 9 (69.2%), were rural dwellers and 11 (84.6%) were married. A high proportion of smear-positive pulmonary tuberculosis cases were reported among those > = 45 years old, 9 (69.2%), and among those respondents who had greater than 5 family members per household, 7 (53.8%). In addition, 5 (38.5%) smear positives were farmers [Table 3].

Table 3: TB smear-positive status among sociodemographic characteristics of the patients who visited the Finchawa Health Center, West Guji Zone, southern Ethiopia, 2023.

Variable	Category	Frequency	Percent (%)
Sex	Male	7	53.8
	Female	6	46.2
Age group	25-34	2	15.4
	35-44	2	15.4
	>=45	9	69.2
Residence	Rural	9	69.2
	Urban	4	30.8
Marital status	Single	2	15.4
	Married	11	84.6
Education status	No formal	2	15.4
	Primary	1	7.7
	Secondary	6	46.2
	Diploma and above	4	30.8
Occupation	Farmer	5	38.5
	Student	4	30.8
	Employer	1	7.7
	Merchant	3	23.1
Family size	<=5	6	46.2
	>5	7	53.8
Weight	35-45Kg	4	30.7
	46-55Kg	7	53.8
	>=56	2	15.4

TB among clinical profile of respondents

Prevalence of TB-HIV co-infections, TB-diabetes mellitus (DM) comorbidity and TB among previous TB infection history were 5 (38.5%), 3 (27.3%) and 6(25%) respectively (Figure 1).

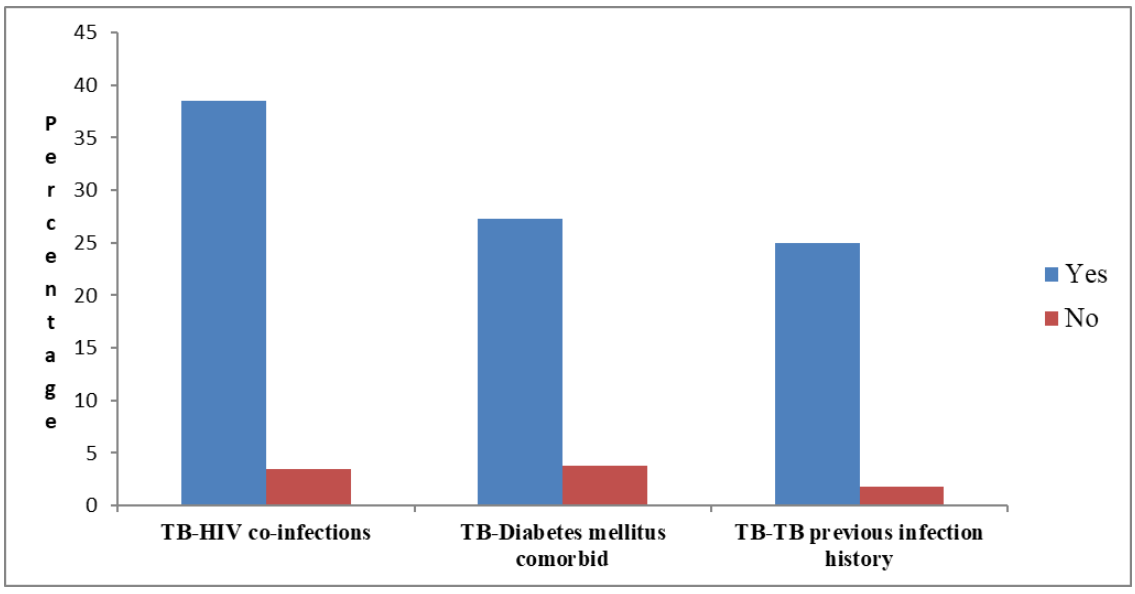

Figure 1: *PTB smear positive among HIV, Diabetes, and previous TB infected patients of Finchawa Health center, southern Ethiopia, 2023.*

Out of the study participants, 6 (12.5%) of those who consumed alcohol and 11 (4.38%) of those who consumed raw milk were TB smear-positive. A total of study participants who had not heard about Tb and those who did not know about TB transmission were 4 (11.8%) and 5 (9.8%), respectively (Table 4).

Table 4: TB smear-positive among contact history, TB information, alcohol and raw milk consumption patients visited Finchawa Health Center, southern Ethiopia 2023.

Characteristics	Category	Frequency	Positive (%)
Contact history	Yes	5	15.6
	No	8	3.32
Alcohol intake	Yes	6	12.5
	No	7	3.11
Raw milk consumption	Yes	11	4.38
	No	2	9.09
Heard about Tb	Yes	9	3.77
	No	4	11.76
Transmittable knowledge	Yes	8	3.60
	No	5	9.80

Factors associated with smear-positive pulmonary tuberculosis

Risk factors for contracting smear-positive pulmonary tuberculosis were assessed first based on bivariate logistic regression, where family size, family contact history, previous Tb infection history, HIV/AIDS positive status, DM status, knowledge about Tb, and raw milk consumption were significantly associated with infection in bivariate logistic regression analysis. Finally, in multivariable logistic regression, family sizes greater than five (AOR = 5.15, 95% C = 1.46-18.29), having a previous family contact history (AOR = 6.7, 95% C.I. = 1.78-22.99), and having a previous history of Tb infection (AOR = 4.76, 95% C.I. = 1.05-21.62) were found to be predictors for contracting smear-positive pulmonary tuberculosis when compared to their counterparts (Table 5).

Table 5: Factors associated with pulmonary tuberculosis smear-positive among presumptive patients visited Finchawa Health Center, West Guji Zone, and southern Ethiopia, 2023.

Factors	Category	Tb status		COR,95% CI	AOR,95% CI
		Positive No. (%)	Negative No. (%)		
Family contact history	Yes	5(30.8)	21(69.2)	7.11(2.14 - 23.69)	6.7 (1.78-22.99)*
	No	8(3.2)	239(96.8)	1	1
Family size	≤5	4(2.1)	183(97.9)	1	1
	>5	9(10.5)	77(89.5)	5.35 (1.60-17.88)	5.15 (1.46-18.29)*
HIV/AIDS status	Positive	2(15.4)	11(84.6)	4.11 (0.81- 20.86)	
	Negative	11(4.2)	249(95.8)	1	
Previous Tb infection	Yes	3(12.5)	21(87.5)	3.41(.87 - 13.37)	4.76 (1.05-21.62)*
	No	10(4)	239(96)	1	1

Note: * indicates statistically significant, Reference= 1

Discussion

In the present institutional-based study, the prevalence of smear-positive pulmonary tuberculosis among presumptive patients was 4.8% with a 95% confidence interval of 2.24–7.29. This finding is in line with a study done in Benishangul Gumuz, which reported 2.3% [14]. However, the results of this study were lower than those of facility-based studies in different parts of Ethiopia. Ataye District Hospital, northeast Ethiopia, reported an 8.98% prevalence of pulmonary tuberculosis [15]. Addis Ababa, 11.9% [16], Nigist Eleni Mohammed Memorial Hospital, Hossana, South Ethiopia, 9.7% [17], Saint Paul's Specialised Hospital in Addis Ababa, Ethiopia, 10% [18], and Adare General Hospital, 30.5% [19], Bale Goba and Robe hospitals reported 9.2% [20], Metehara Sugar Factory Hospital reported 14.2% [21], and Ambo hospital reported 9.9% [22]. The methodological variation between the studies used to screen for acid-fast bacilli in the aforementioned research, which has a lower sensitivity than a molecular method (GeneXpert), may be the likely explanation for this discrepancy. The skill of the laboratory, the quality of the smear, and the reagents themselves may all have an impact on the difference in the detection of acid-fast bacilli. In the current study, the TB prevalence among HIV seropositives was 38.5%. This finding is higher than the study conducted in Nepal, which reported 9.9% [23], the study done in Ghana, which reported 18.6% [24], Debre Markos Referral Hospital, Ethiopia, which reported 16.6% [25], and Addis Ababa, which reported 5.3% [26]. However, this finding is lower than the study conducted in Tanzania, which reported 58.3% [27], and Bale Goba and Robe hospitals, which reported 44.4% [20].The implications are that TB is the most opportunistic infection among people living with HIV and increases the chance of latent TB infection progressing to active TB disease. The variations could be attributed to ART status, differences in the awareness level of the patients, and access to health care facilities.

The study revealed that the prevalence of TB and DM comorbidity was 27.3%. This result was higher than studies conducted in South Africa (3.0% [28], Debre Tabor General Hospital (2.71% [29], Hawassa (5.3% [30], Addis Ababa (7.1% [26], and Dessie (6.2% [31]). The higher PTB and DM comorbidity in the study area may be due to lower regular monitoring of DM, a TB prevention programme, the immunity status of the patients, and financial constraints. On the other hand, PTB smear positivity among previous TB-infected individuals was 25%. It was comparable with the report of the study done in Bale Goba and Robe hospitals, at 22.2% [20], but lower than the report of the study conducted in Metehara Sugar Factory Hospital, at 33.3% [21]. It might be due to past TB infections that the immune system of the body declined and compromised its capacity to defend against opportunistic infections, including tuberculosis.

Regarding associated factors, having greater than five family sizes increases the chance of having PTB smear positivity by five times, which agrees with a study conducted in Metehara Sugar Factory Hospital that reported the prevalence of smear positivity increases as the number of family sizes per household increases [21]. Having a previous family contact history makes you 7 times more likely to have PTB smear positivity, which is similar to a previous study conducted in Bale Goba and Robe hospitals [20]. having a previous history of Tb infection nearly 5 times more likely to have PTB smear positive, which contrary to the study done Bale Goba and Robe hospitals reported previous TB infection found to be statistically insignificant ($p > 0.05$) with smear positive PTB [20].

Limitations of the Study

The limitation of this study was the use of direct smear microscopy alone for the diagnosis of TB. It may underestimate the prevalence of PTB in this study population. The chronic disease comorbidities are self-reported by the patient, not from medical records.

Conclusions and recommendations

The Finchawa Health Centre in West Guji was found to have a 4.8-fold higher prevalence of smear-positive pulmonary tuberculosis than the general Ethiopian population. Significant risk factors for smear-positive pulmonary tuberculosis include greater numbers of family members, prior infection history, and prior family history contact. In order to ensure early diagnosis and the start of anti-TB treatment, zonal and district health departments should emphasise thorough tracking of presumed PTB suspects and regular assessment of PTB suspects. Furthermore, to better understand its effect on the transmission of TB, including MDR-TB, large-scale studies using cutting-edge laboratory techniques should be carried out.

Abbreviations and acronyms

AIDS	Acquired Immunodeficiency Syndrome
AOR	Adjusted Odds Ratio
ART	Anti Retro Viral Therapy
BCG	Bacillus Chalmette Guerin
CDC	Central Disease Control
CI	Confidence Interval
DM	Diabetes Mellitus
EFMOH	Ethiopian Federal Ministry of Health
EMOH	Ethiopian Ministry of Health
EPT	Extrapulmonary Tuberculosis
FMOH	Federal Ministry of Health
HAART	Highly Active Anti-Retroviral Therapy
HIV	Human Immune Deficiency Virus
LED-FM	Light-Emitting Diode Florescent Microscopy
LTBI	Latent Tuberculosis Infection
MDR-TB	Multidrug Resistant Tuberculosis
MOH	Ministry of Health
TB	Tuberculosis
TST	Tuberculin Skin Test
PTB	Pulmonary Tuberculosis
WHO	World Health Organization

Availability of Data and Materials

Data for this research are available for this work and can be accessed from the corresponding author.

Competing Interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and publication of this paper.

Consent for Publication

Not applicable

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Contributions from Authors

AA: Executed conceptualization, created proposals, developed resources, managed projects, conducted research and monitoring, and interpreted results. **YA, GR, LA, DT,** and **AI** provided oversight, prepared and interpreted documents, preparation of the manuscript. Final manuscript was read and approved by all writers.

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Supplementary Materials

S1 file: Questionnaire. It is contain the details of the questions for data collection from the patients.

References

1. USAID W U. Global Tuberculosis Report. 2019.
2. Lienhardt C, Fielding K, Sillah J, Tunkara A, Donkor S, Manneh K et al. Risk factors for tuberculosis infection in sub-Saharan Africa: a contact study in The Gambia. Am J Respir Crit Care Med. 2003;168(4):48–55.
3. Shah S, Mujeeb S, Mirza A, Nabi K SQ. Prevalence of pulmonary tuberculosis in Karachi juvenile jail, Pakistan. EMHJ -Eastern Mediterr Heal J. 2003;9(4):667–74.
4. Chaisson RE, Bishai WR. Overview of Tuberculosis. In: Handbook of Tuberculosis [Internet]. Cham: Springer International Publishing; 2017. p. 1–15. Available from: http://link.springer.com/10.1007/978-3-319-26273-4_1
5. WHO. Global Tuberculosis Report 2020. 2020
6. World TB Day 2021 | WHO | Regional Office for Africa.
7. Ethiopia – TREAT TB.
8. Melkamu H, Seyoum B DY. Melkamu H, Seyoum B, Dessie Y. Determinants of tuberculosis infection among adult HIV positives attending clinical care in western Ethiopia: a case–control study. AIDS Res Treat. 2013;2013.
9. Slama K, Chiang C, Enarson D, Hassmiller K, Fanning A, Gupta P et al. Tobacco and tuberculosis: a qualitative systematic review and meta-analysis. Int J Tuberc Lung Dis. 2007;11(10):2007.
10. WHO. WHO consolidated guidelines on tuberculosis;drug-resistant tuberculosis treatment. 2020.
11. Pongwittayapanu P, Anothaisintawee T, Malathum K WC. Incidence of newly diagnosed tuberculosis among healthcare workers in a teaching hospital, Thailand. Ann Glob Heal. 2018;84(3):2018.
12. Deribew A, Negussu N, Melaku Z, Deribe K (2011) Investigation Outcomes of Tuberculosis Suspects in the Health Centers of Addis Ababa, Ethiopia. PLoS ONE 6(4): e18614. doi:10.1371/ journal.pone.0018614.
13. Ethiopian Federal Ministry of Health. Guidelines for Clinical and Programmatic Management of TB , TB/HIV , DR-TB and Leprosy in Ethiopia. TBL guidlene. 2021
14. Tilahun Addisu Duressa, Mekuriaw Alemu Mersha, Dawit Assefa, Eveline Klinkenbergt. Prevalence and Associated Risk Factors of Pulmonary Tuberculosis Among Prisoners in Benishangul Gumuz Region, Ethiopia. American Journal of Nursing and Health Sciences. Vol. 3, No. 1, 2022, pp. 1-8. doi: 10.11648/j.ajnhs.20220301.12
15. Gebretsadik D, Ahmed N, Kebede E, Mohammed M, Belete MA. Prevalence of tuberculosis by automated genexpert rifampicin assay and associated risk factors among presumptive pulmonary tuberculosis patients at ataye district hospital, north east ethiopia. Dovepress. 2020;13:1507–16.
16. Negesse A, Belay M, Medhin G, Ayalew S, Mihret A. Prevalence of pulmonary tuberculosis among patients presenting with cough of any duration in Addis Ababa , Ethiopia Email address. 2019
17. Tesfaye DJ, Tirore LD, Beshir WG, Shimelis T. Smear Positivity and Associated Risk Factors among Pulmonary Tuberculosis Suspects at Nigist Eleni Mohammed Memorial Hospital ,. Open Access Libr J Smear. 2015;18:1–8.
18. Nugussie DA, Mohammed GA, Tefera AT. Prevalence of Smear-Positive Tuberculosis among Patients Who Visited Saint Paul ' s Specialized Hospital in Addis Ababa , Ethiopia. Hindawi. 2017;2017.
19. Andarge DB, Anticho TL, Jara GM, Ali MM. Prevalence of *Mycobacterium tuberculosis* infection and rifampicin resistance among presumptive tuberculosis cases visiting tuberculosis clinic of Adare General Hospital, Southern Ethiopia. SAGE Open Med. 2021 Sep 15;9:20503121211045541. doi: 10.1177/20503121211045541. PMID: 34540228; PMCID: PMC8447093.

20. Tulu B, Dida N, Kassa Y, Taye B. Smear positive pulmonary tuberculosis and its risk factors among tuberculosis suspect in South East Ethiopia ; a hospital based cross-sectional study. BMC Infect Dis. 2014;7(285):1–6.

21. Yohanes A, Abera S, Ali S. Smear positive pulmonary tuberculosis among suspected patients attending metehara sugar factory hospital ; eastern Ethiopia Correspondence author : Afr Health Sci. 2011;12(3):325–30.

22. Gelalcha, AG., Kebede, A. and Mamo, H. Light-emitting diode fluorescent microscopy and Xpert MTB/RIF® assay for diagnosis of pulmonary tuberculosis among patients attending Ambo hospital, westcentral Ethiopia. BMC Infectious Diseases (2017) 17:613. https://doi 10.1186/s12879-017-2701-5

23. Adhikari N, Bhattarai RB, Basnet R, Joshi LR, Tinkari BS, Thapa A, et al. (2022) Prevalence and associated risk factors for tuberculosis among people living with HIV in Nepal. PLoS ONE 17(1): e0262720. https://doi.org/10.1371/journal. pone.0262720

24. Salisu HM, Ojule IN, Adeniji FO, Kwakye GK (2022) Prevalence and trend of TB/HIV coinfection in Suhum Municipality, Ghana. PLOS Glob Public Health 2(7): e0000378. https://doi.org/ 10.1371/journal.pgph.0000378

25. Mulu W., Abera B., Yimer M., Hailu T., Ayele H. and Abate, D. Rifampicin-resistance pattern of Mycobacterium tuberculosis and associated factors among presumptive tuberculosis patients referred to Debre Markos Referral Hospital, Ethiopia: a cross-sectional study. BMC Res Notes (2017) 10:8 DOI 10.1186/s13104-016-2328-4

26. Sinshaw W, Kebede A, Bitew A, Tesfaye E, Tadesse M, Mehamed Z, et al. Prevalence of tuberculosis, multidrug resistant tuberculosis and associated risk factors among smear negative presumptive pulmonary tuberculosis patients in Addis Ababa, Ethiopia. BMC Infectious Diseases (2019) 19:641 https://doi.org/10.1186/s12879-019-4241-7

27. Kamenju and Aboud, S. Tuberculosis-HIV co-infection among patients admitted at Muhimbili National Hospital in Dar es salaam, Tanzania PILI Tanzania Journal of Health Research Volume 13, Number 1, January 2011 25

28. Berkowitz N, Okorie A, Goliath R, Levitt N, Wilkinson RJ, Oni T. The prevalence and determinants of active tuberculosis among diabetes patients in Cape Town, South Africa, a high HIV/TB burden setting. Diabetes research and clinical practice. 2018;138:16-25.

29. Andualem T ME. Pulmonary tuberculosis and associated factors among diabetic patients attending health care at Debre Tabor General Hospital, Northwest Ethiopia. Ethiop J Heal Dev. 2021;35(2):2021.

30. Abera A, Ameya G. Pulmonary Tuberculosis and Associated Factors Among Diabetic Patients Attending Hawassa Adare Hospital, Southern Ethiopia. The Open Microbiology Journal. 2018;12:333.

31. Amare H, Gelaw A, Anagaw B GB. Smear positive pulmonary tuberculosis among diabetic patients at the Dessie referral hospital, Northeast Ethiopia. Infect Dis poverty. 2013;2(1):2013.

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