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Prevalence of Active Tb and Associated Factors Among Male Adults Attending Hargeisa Tb Hospital

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Abstract

Mycobacterium tuberculosis is a TB germ that spreads via air, and it is just like a cold. Pulmonary TB patients are very contagious and they transmit the disease through coughing or sneezing. Through this study, Hargeisa TB Hospital will be used as the setting for assessing TB prevalence and associated factors among male TB patients in Somaliland. 296 respondents were selected through animals' lining method for a cross-sectional study. SPSS version 23 was used for data analysis. The research revealed that 66.2% of the participants smoked three to six cigarettes a day, accounting for 55.7% of the total respondents who smoked. The percentage of alcohol consumed was 44.2%, whilst the percentage of illegal drug use was 34.1%. In addition, 52.4% of them occasionally rode public transit, which may have contributed to their tuberculosis infection. 65.5% of survey participants identified HIV as a significant TB risk factor, and 90% of them ranked HIV's significance in relation to the TB mortality rate. It is important to note, nevertheless, that although 92.9% of those tested tested positive for tuberculosis, only 60.8% of them finished the whole course of therapy. The study indicates that drug and alcohol abuse, smoking, and HIV co-infection are factors that influence TB rates in adult males. Recommendations include the focus testing, the proper use of medications, and fostering community interventions.

Keyword: Tuberculosis (TB); Alcohol Consumption; Drug Abuse; TB hospital; Hargeisa

Introduction

The illness TB is caused by the microbacterium known as Mycobacterium tuberculosis [1]. It is mostly transmitted by inhaling droplet nuclei containing the visulent type of bacteria into the lungs. Although tuberculosis (TB) may infect nearly every area of the body, lung TB accounts for over 80% of cases [2]. Even though it occurs less frequently, mycobacterium bovis—a type of microbe present in cow's milk— can also be fed to an uninfected person if it is not pasteurised. This means that the uninfected person can contract tuberculosis from the eating of the paste bacteria [3].

One of the earliest known illnesses in human history, tuberculosis (TB) has been detected in Egyptian mummies from 3000-2400 BC and in prehistoric human bones from 7000 BC. In India and the Americas, tuberculosis (TB), sometimes known as "phthisis" or "consumption," has a long history dating back to 2000 BC [4]. Up until the middle of the 1800s, the condition was mostly believed to be inherited. Those who suffered from it were segregated in sanatoriums in order to receive therapy with fresh air. The discovery of the TB bacillus, the disease's causal agent, by German scientist Robert Koch on March 24, 1882, marked a turning point in the field of tuberculosis research by permitting more precise diagnostic techniques [5].

However, in terms of morbidity and death, TB remains one of the most important health issues in the world. The illness is frequently referred to as the "White Plague" because to its severe symptoms, which include fever, pallor, cachexia, and bloody cough. Epidemiological research indicates that high alcohol use and TB are strongly associated, particularly in men. Alcohol usage was the cause of around 10% of all instances of TB, with excessive drinking being the cause of the disease's beginning and progression [6].

Global tuberculosis mortality is presenting a complex picture of patterns. The initial half of the TB fatalities curve showed a general drop until 2019, at which point the numbers spiked in 2020 and 2021, especially in most of the 30 countries with high TB burdens. However, throughout this time, the WHO African Region was the only one where the number of TB-related fatalities continued to decline, but the Eastern Mediterranean Region did observe a very tiny decline from 2020 to 2021 [1].

The high rate of tuberculosis in adult males is an ongoing health problem, particularly in resource-poor areas like Hargeisa, Somaliland [7]. The purpose of this study is to assess the incidence of active tuberculosis (TB) and associated variables among adult male patients who would be receiving care at the Hargeisa TB Hospital in 2024. Comprehending the sociodemographic, behavioural, and HIV-related elements linked to the elevated incidence of tuberculosis in adult males would yield crucial insights for tailored treatments and enhanced tuberculosis control tactics within the area.

Literature Review

One of the earliest known occurrences of a human disease and a major cause of death since antiquity, tuberculosis (TB) has been a problem since the apartheid era. The fact that various countries refer to the flees sickness by different names demonstrates its historical and global relevance. It is evident from the Buddhist literature that tuberculosis was considered a highly harmful disease since it was called "Yakshma," which translates to "a wasting disease." These descriptions of the symptoms of tuberculosis have been found in the medical literature of ancient China and the Arabic nations, indicating that the disease is, in fact, widespread [8].

According to [9] the word "tuberculosis" is derived from the Latin word "tuberculum," which implies a little lump and refers to the distinctive granulomas that develop in injured tissues. Numerous terms have been used to refer to tuberculosis over the years, including Phthisis, Lupus vulgaris, Consumption, and King's Evil, which illustrates the variety of clinical presentations of the illness and the historical perception of it.

According to scientific archaeological data, tuberculosis (TB) is a disease that has been plaguing humans for over a millennium. Skeletal remains from Neolithic sites in Europe, as well as from the ancient Egyptian, Greek, and Roman civilisations, have been shown to exhibit symptoms of a disease that is similar to the modern tuberculosis (TB) epidemic. The 8000 B.C. dating of prehistoric human bones from Germany is one example of this unmistakable proof of tuberculosis. In addition, Pott's illness, a kind of tuberculosis that affects the spine, has been found in Egyptian mummies that were buried between 2500 and 1000 B.C. The remains of an eight-year-old kid from an Inca mummy from around 700 A.D. may provide the strongest proof. The sole acid-fast bacilli consistent with Mycobacterium bovis was found in these remains, which also had radiographic symptoms of Pott's illness [10].

Robert Koch's discovery of Mycobacterium tuberculosis, the bacterium that causes tuberculosis, in 1882 marked a significant advancement in the understanding and treatment of the illness. This discovery served as a catalyst for the ongoing advancement of tuberculosis research and treatment, as tuberculosis remains a major global health concern [5].

Numerous biological, behavioural, and socioeconomic variables have been shown to impact tuberculosis (TB), according to research on the disease's presence and associated components. It has been noted that sex may contribute to TB susceptibility in addition to the real genetic predisposition since men and women respond differently to the immune system. Men have higher rates of tuberculosis (TB) for a variety of reasons, including biological variables and behavioural ones like consuming alcohol and smoking, which are recognised to be risk factors for the disease [11]. Socioeconomic considerations have a key role in influencing tuberculosis rates. Men are more likely than women to experience illness and health inequalities associated with circumstances like homelessness and im-

prisonment. Higher rates of tuberculosis transmission follow as a result. Furthermore, dangerous occupations that target men include mining and construction, where workers are exposed to silica dust, which significantly raises the risk of tuberculosis [12].

The primary cause of the Hargeisa area's lack of resources for tuberculosis treatment—which would result in a high rate of tuberculosis among men in the area—will be resource limits. Studies conducted in comparable contexts have demonstrated that at times of economic downturn and health challenges, such as limited access to healthcare, individuals identified with late-stage infection are more likely to re-infect, resulting in worsening health outcomes [13].

This study investigates the prevalence of active tuberculosis (TB) and associated factors among adult male patients attending Hargeisa TB Hospital in 2024, building on earlier studies. Since the targeted population is taken into account by the particular sociodemographic, behavioural, and HIV-related characteristics pertinent to this study, it is anticipated to yield more focused insights that can guide the implementation of efficient TB control measures in Somaliland.

Methodology

Research Design

This study used a cross-sectional study design to evaluate the prevalence of active tuberculosis (TB) and associated variables among adult males in a Hargeisa, Somaliland. Targeted treatments may be made easier because to the efficient and cost-effective design, which also provides insights into the correlations between numerous variables, including behavioural, health-related, and sociodemographic characteristics, and the prevalence of active tuberculosis.

Research Population

The target population was the male adult people who was the visiting at Hargeisa General TB hospital. Where source of the population of this study was the male adult population who was their visited in TB department at Hargeisa TB Regional hospital.

Simple Size

The study was utilizing the single population proportion formula technique to determine the study population sample size.

$$n = \frac{(Z_{\frac{\alpha}{2}})^2 P(1-P)}{d^2}$$

N = sample size.
P = is the population with active TB which is 26%.
Zα/2 = is the critical value at the 95% confidence interval level of certainty (1.96).
D = is the margin of error between the sample and population (5%).

$$n = \frac{(1.96)^2 * (0.26)(1-0.26)}{(0.05)^2} = 296$$

Therefore our sample size is 296 respondents.

Sampling Procedure

The study was using simple random sampling to select the TB patients from the TB department of Hargeisa TB hospital.

Inclusion criteria

This study included male adults with tuberculosis that visited a Hargeisa TB Hospital during the study.

Exclusion Criteria

The study excluded male Patients who are ill and those who cannot communicate and those who are rejected to praticipate the study.

Validity and Reliability of the Instrument

The survey was initially created in English and then translated into Somali (local language) and then translated back into English by two linguists to guarantee the precision of the Questionnaire administration: asking the respondents' questions. Data collection instrument was pretested to determine validity of the questions, and the questionnaire translation to the respondents was done in order for it to become valid and reliable.

Data Gathering Procedures

Data was collected by a used close ended questionnaire was administered by the researcher and was knowledgeable of the local language and English. The data was qualitative data collection by using structured questionnaire and the researcher interviewed the people. Questionnaire pre-testing was carrying out before the actual data collection to ensure validity and reliability of the study. The some researchers are explains by the purpose of the study to respondent to get accurate and reliable data. The choice of this questionnaire is that a questionnaire is easy to conduct and quick method at the side of data collection, it's also less time consuming.

Data Analysis

Quantitative data was entry and analyzed in SPSS (v21); data was clean by running frequencies of all the variable by check for incorrectly code of data. Incorrectly coded data was checked again with in the raw data in the questionnaire and correct. Statistical methods were used to analyzed the data was collected such as Descriptive statistics, for example numerical summations, graphs and tables.

Results

Demographic profile of the respondents

Variable	*Category*	*Frequency (n= 296)*	*Percentage (100%)*
Age of the respondents	15-25	55	18.6
	26-35	111	37.5
	36-45	70	23.6
	46-55	60	20.3
Education level of respondents	Primary	66	22.3
	Intermediate	80	27
	Secondary	95	32.1
	University	55	18.6
Occupation of the respondents	Employee	160	54.1
	Unemployment	136	45.9
Marital status of the respondents	Single	131	44.2
	Married	105	35.5
	Divorced	45	15.2
	Separated	15	5.1

Monthly Income of the respondents	Less than 50$	100	33.8
	50 - 100$	50	16.9
	100-200$	70	23.6
	More Than 200	76	25.7

Table 1: Demographic profile of the respondents.

The demographic profile of the respondents, as presented in Table 1, reveals that the age distribution of the respondents reflects a wide range of participant ages. Particularly, 111 respondents (37.5%), 70 respondents (23.6%), 60 respondents (20.3%), and 55 respondents (18.6%) belonged to the first age group, the second age group, and the third age group. With the biggest group falling into the second age group, this distribution implies a balanced representation across several age groups, suggesting that the study sampled a wide variety of ages, which can give unique viewpoints on the issue under inquiry The respondents' educational backgrounds varied: 66 (22.3%) had only completed elementary school, 80 (27%), had completed intermediate school, 95 (32.1%) had completed high school, and 55 (18.6%) had completed university education. According to the statistics, most of the respondents have finished their secondary school, which is followed by their intermediate and primary education. Based on their distribution, the majority of respondents appear to have had at least some formal education, which may have an impact on their knowledge of and comprehension of public health concerns. With relation to employment, 136 respondents (45.9%) were jobless and 160 respondents (54.1%) were employed. The sample appears to encompass a varied range of socioeconomic origins, which may have an influence on their health outcomes and access to healthcare services. This is shown by the roughly equal number of employed and unemployed persons. The respondents' marital status was as follows: Out of the total respondents, 131 (44.2%) were single, 105 (35.5%) were married, 45 (15.2%) were divorced, and 15 (5.1%) were separated. Since most of the respondents were single, their health and wellbeing may have been impacted by prospective familial support networks. The respondents' monthly income distribution was as follows: 100 (33.8%) made less than $50, 50 (16.9%) made between $50 and $100, 170 (23.6%) made between $100 and $200, and 76 (25.7%) made more than $200. Less than $50 was the income bracket in which the majority of respondents fell. This suggests that a sizeable section of the sample population may be struggling financially, which may have an impact on their general health and ability to receive healthcare.

Behaviors factors to the Active Tuberculosis Prevalence in Adult Males at the Hargeisa TB Hospital

Variable	*Category*	*Frequency (n= 296)*	*Percentage (100%)*
The respondents' use of cigarettes	Yes	165	55.7
	No	131	44.3
Number of cigarette per day	1-3	55	18.6
	3-6	196	66.2
	6-9	45	15.2
Consumed Alcohol for respondent	Yes	131	44.2
	No	165	55.7
Used Illicit drugs	Yes	101	34.1
	No	195	65.9
Regularly use public transportation	Yes	155	52.4
	No	141	47.6

Table 2: Behavioral Factors in the Hargeisa TB Hospital Associated with Adult Males.

Several important findings were drawn from a study on the incidence of hazardous behaviour and active TB in male people attending the Hargeisa TB Hospital in 2024. Of the 296 respondents, 165 people, or 55.7%, acknowledged smoking cigarettes, whereas 131 people, or 44.3%, did not. Among those who smoked, 66.2% (196 respondents) of the smokers reported smoking three to six cigarettes a day. The remaining group of responders, 18.6% (55), smoked one to three cigarettes a day, and 15.2% (45) smoked six to nine cigarettes a day. As a result, it can be said that a sizable portion of the populace was smokers, and that most of them smoked a daily average of about fifty cigarettes, which might be one of the causes of the high TB incidence. Regarding alcohol usage, 131 respondents, or 44.2%, acknowledged using alcohol, whereas 165 respondents, or 55.7%, did not. This suggests that alcohol usage, a recognised cause of tuberculosis, affects over half of the population. Furthermore, 195 respondents, or 65.9%, abstained from drug usage, whereas 101 respondents, or 34.1%, acknowledged using illicit drugs. Drug misuse is another behavioural factor that can lead to tuberculosis (TB), which is frequently associated with weakened immune systems and worsening health. Additionally, the study showed that whilst 47.6% of respondents (141) did not utilise public transit, 52.4% of respondents (155) did. Frequent usage of public transit may increase the risk of tuberculosis (TB), particularly in areas with movement but insufficient ventilation, which can promote the disease's spread. TB control strategies focus mostly on the behavioural factors described above, including regular use of public transportation, consuming alcohol, smoking, and using illicit substances. It draws attention to the necessity of focused initiatives that can assist in addressing these particular dangers.

Health related Factors in the Hargeisa TB Hospital Associated with Adult Males

Variable	***Category***	***Frequency (n= 296)***	***Percentage (100%)***
The respondent's greatest risk factor for tuberculosis is HIV.	Strongly agree	194	65.5
	Agree	59	19.9
	Neutral	25	8.5
	Disagree	12	4.1
	Strongly Disagree	6	2
HIV stages are more related to active TB for respondents	Stage one	20	6.8
	Stage two	165	55.7
	Stage three	111	37.5
HIV's Effect on TB Death Rates	Yes	266	90
	No	30	10
TB tests that the respondents had received	Skin Test	105	35.5
	Blood Test	76	25.7
	Tine Test	45	15.2
	Do not know	70	23.6
TB screening test was positive for respondents	Yes	275	92.9
	No	21	7.1
After a positive TB test, a prescription was received	Yes	280	94.6
	No	16	5.4
Treatment Completed	Yes	180	60.8
	No	116	39.2
Living with a TB-Positive Household Member	Yes	111	37.5
	No	185	62.5

Table 3: Health-Related Factors Associated with Adult Males in the Hargeisa TB Hospital.

Table 3 provides an overview of the respondents' TB health risk factors. HIV and TB are strongly correlated, as evidenced by the large majority (n = 194) who were highly convinced (65.5%) that HIV is their biggest risk factor for TB and the additional fifth (19.9%) who agreed. The fact that just 6.1% of the stakeholders objected and/or strongly disapproved shows how widely held the view is that HIV is the primary risk factor. Concerning the phases of HIV, 37.5% (n=111) of the investigators assert that they are in the third stage, whilst 55.7% (n=165) believe they are in the second. This suggests that a significant percentage are in the advanced stages, making them more susceptible to active tuberculosis. Furthermore, 90% (n=266) acknowledge that HIV contributes to greater TB death rates; hence, raising awareness and implementing intervention are the most crucial things to accomplish. Data results of the study clearly indicate that many people are in advanced, which intensifies their vulnerability to the interplay of active TB. Furthermore, nine out of ten of the developing nations with the highest rate of HIV infection mention that HIV infection has a significant impact on the death rate from tuberculosis (TB). For this reason, medical accuracy has been scientifically proven to be necessary, but research-based prevention and treatment remain the most unpredictable factors. People who are eating out or strolling along the street are typically the unwitting pandemic whistleblowers. In terms of TB testing, 15.2% (n=45), 25.7% (n=76) conducted blood tests, 35.5% (n=105) took skin tests, and 23.6% (n=70) were unsure about the findings. Since 92.9% of people (n=275) tested positive for tuberculosis (TB), and 94.6% of people (n=280) received prescription drugs once their positive diagnosis was verified, infectiousness is a serious problem. However, only 60.8% (n=180) have completed the whole 6-month therapy course, indicating incomplete treatment rates. Ultimately, 37.5% (n=111) of them either survive the TB-positive home or are a part of the TB household, indicating that there are circumstances in which exposure may occur.

Discussion

There is a significant prevalence of tuberculosis (TB) among adult males at the Hargeisa TB Hospital. The study's responder demographic profile suggests that socioeconomic variables like education might have a significant impact on the illness. The age distribution of the respondents demonstrates that participation is evenly distributed throughout the different age groups, with the majority of respondents (37.5%) falling into the 26-35 age range. The group's balance ensures that many viewpoints will be considered. Consequently, this will align with the results of previous study that emphasise the significance of age variety for tuberculosis research [14]. In TB research, age diversity is recognised to be important. Given that 32.1% of the respondents having finished secondary school, their educational backgrounds also represent a varied but considerable level of formal education. This is consistent with research suggesting that a greater level of education may help one comprehend and identify public health problems, such as tuberculosis [15]. However, as [16] pointed out in their study on the prevalence of tuberculosis in low-income settings, the high percentage of unemployment (45.9%) might be the cause of the financial hardships preventing people from accessing healthcare.

The participants may exhibit dangerous behaviours including drinking alcohol, smoking, or using illicit drugs. 44.2% of respondents said they drank alcohol, compared to 55.7% who said they smoked cigarettes. These habits are well-known risk factors for tuberculosis (TB), since they can impair immunity and increase a person's susceptibility to infection [17]. Among the responders, using public transport (52.4%) is another way that tuberculosis might spread through the air. Studies by [18] show that the surge in airborne TB transmission is caused by crowded and poorly ventilated venues. The main takeaways from these findings underscore the necessity of targeted interventions targeted at reducing the previously described hazardous behaviours in order to effectively manage tuberculosis.

The health-related variables would increase the research group's risk of tuberculosis. As many of the respondents are also in advanced stages of HIV infection, a significant majority (65.5%) strongly correlate HIV as the primary risk factor for tuberculosis (TB). This is consistent with prior research showing that HIV significantly increases the risk of developing active tuberculosis (TB) [19]. It should be highlighted that the urgent need for integrated HIV and TB treatment programs stems from the fact that 90% of respondents believe that HIV has an impact on the mortality rates from TB, a claim that is only corroborated by [20]. According to study by [21], even while the incidence of TB diagnosis is rather high (92.9%), the completion of the whole treatment cycle is still low (60.8%), which may result in TB strains that are resistant to drugs. The fact that 37.5% of TB-positive household members co-exist with TB-positive

persons highlights the clear need for comprehensive TB care, which should involve monitoring household contacts and preventative medication, as recommended by [22]. The new study's findings support earlier research showing that TB infection is caused by the interaction of behavioural, health-related, and demographic variables. The key to reducing the prevalence of tuberculosis and improving health outcomes in high-risk populations is to address these concerns with targeted public health initiatives and ensure that tuberculosis treatment courses are completed.

Conclusion

The main conclusions of the study on the health-related, behavioural, and demographic factors influencing the prevalence of tuberculosis (TB) in adult men at Hargeisa TB Hospital are critical insights. The primary age group of respondents is their age, however the population is made up of people of working age and a variety of educational backgrounds. This fairly income-based resemblance indicates that tuberculosis affects individuals from a variety of socioeconomic backgrounds, which in turn has an impact on their health and access to healthcare. Behavioural variables, such as alcohol and drug use, smoking, and other risk behaviours, were found to be important contributors to the high incidence of tuberculosis (TB). This suggests that frequent public health interventions targeting these risk behaviours are necessary. The fact that TB and HIV are frequently co-infected, particularly when HIV-related TB is at an advanced stage, emphasises the critical need for integrated care and preventative measures for efficient co-infection treatment. The non-fulfillment of treatment regimens, which suggests possible impediments to treatment adherence, is concerning despite the high proportion of positive TB tests and treatment prescriptions. Additionally, the concerning proportion of respondents who live with a household member who has tuberculosis suggests that community-level actions are essential to halting the spread of tuberculosis. Overall, these findings support the need for broad, multifaceted responses to the TB epidemic, including co-infection management, medication adherence, and behavioural modification.

Recommendations

1. ***Increase Public Knowledge and Education on TB Prevention***: The programs should first completely separate themselves from a traditional hospital environment before using a variety of public relations strategies to spread the word. The primary focus of the ads should be on substance abuse, alcoholism, and smoking, as these behaviours weaken the immune system and lead to tuberculosis. Second, AZT is mentioned as a possible TB treatment. Thus, reducing the spread of tuberculosis would also benefit from interventions to address treatment resistance through medication adherence.
2. ***Boost Accessibility and Use of TB and HIV Testing Services***: Provide regular access to TB and HIV testing for everyone, particularly individuals who use public transit regularly and those who are HIV positive. One way to effectively reach out to these areas is through the use of lateral testing or mobile clinics.
3. ***Execute Specific Interventions for High-Risk Populations***: Create specifically focused intervention programs for those who have been recognised as high-risk, such as smokers, individuals with a history of drug addiction, and patients with advanced HIV. In order to guarantee effective adhesion therapy, these programs might include individualised counselling, support groups, and closer supervision.
4. ***Strengthen Treatment Adherence Support Systems***: Boost the current frameworks to support tuberculosis patients in finishing their treatment regimens and, as a result, ensure their recovery. This might be accomplished by offering rewards to those who adhere to treatment plans and reminding clients of their counselling follow-up appointments.
5. ***Encourage Environmental and Behavioural Modifications***: Encourage improvements to the environment and behaviour, such as reducing the usage of public transit during rush hours and improving ventilation in busy areas. Furthermore, it is important to promote healthy lifestyle options, such as drug addiction treatment and programs for quitting smoking.

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Volume 8 Issue 4 April 2025