Prejudice and misconceptions about tuberculosis and HIV in rural and urban communities in Ethiopia: a challenge for the TB/HIV control program

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Abstract
Background: In Ethiopia, where HIV and tuberculosis (TB) are very common, little is known about the prejudice and misconceptions of rural communities towards People living with HIV/AIDS (PLHA) and TB.

Methods: We conducted a cross sectional study in Gilgel Gibe Field Research area (GGFRA) in southwest Ethiopia to assess the prejudice and misconceptions of rural and urban communities towards PLHA and TB. The study population consisted of 862 randomly selected adults in GGFRA. Data were collected by trained personnel using a pretested structured questionnaire. To triangulate the findings, 8 focus group discussions among women and men were done.

Results: Of the 862 selected study participants, 750(87%) accepted to be interviewed. The mean age of the respondents was 31.2 (SD ± 11.0). Of the total interviewed individuals, 58% of them were females. More than half of the respondents did not know the possibility of transmission of HIV from a mother to a child or by breast feeding. For fear of contagion of HIV, most people do not want to eat, drink, and share utensils or clothes with a person living with HIV/AIDS. A higher proportion of females [OR = 1.5, (95% CI: 1.0, 2.2)], non-literate individuals [OR = 2.3, (95%CI: 1.4, 3.6)], rural residents [OR = 3.8, (95% CI: 2.2, 6.6)], and individuals who had poor knowledge of HIV/AIDS [OR = 2.8, (95%CI: 1.8, 2.2)] were more likely to have high prejudice towards PLHA than respectively males, literates, urban residents and individuals with good knowledge. Exposure to cold air was implicated as a major cause of TB. Literates had a much better knowledge about the cause and methods of transmission and prevention of TB than non-literates. More than half of the individuals (56%) had high prejudice towards a patient with TB. A larger proportion of females [OR = 1.3, (95% CI: 1.0, 1.9)] and non-literate individuals [OR = 1.4, (95% CI: 1.1, 2.0)] had high prejudice towards patients with TB than males and literate individuals.

Conclusion: TB/HIV control programs in collaboration with other partners should invest more in social mobilization and education of the communities to rectify the widespread prejudice and misconceptions.

Background
The high burden of TB/HIV co-infection and the emergence of multi-drug resistance TB (MDR-TB) are a growing concern for developing countries particularly for Africa[1]. Most (79%) of the TB/HIV co-infected patients reside in Africa[1].

In 2008, Ethiopia ranked 7th and 3rd in terms of the total number of incident cases of pulmonary and extra pulmonary TB among the 22 highly affected countries in the world[1,2]. Tuberculosis is the first cause of hospitalization and the third cause of adult mortality in the country. The numbers of TB cases are increasing every year and a total of 1,166,863 TB cases have been identified and registered for Directly Observed Short Course Therapy (DOTS) in the last 10 years[3]. Ethiopia is also one of the Sub-Saharan African countries heavily affected by HIV/
AIDS with a point prevalence of 2.2%. Currently, there are an estimated 1.3 million PLHA in Ethiopia. The rate of TB HIV co-infection is high in Ethiopia, ranging from 25% to 57%, in different regions of the country[4-8].

Behavioral factors such as poor health care seeking behavior [9-13], poor adherence to anti-retroviral[14-16] and anti-TB [17-19] treatments, stigma and discrimination towards patients with TB [20-22] and HIV[23-25] are major challenges for TB/HIV control programs in low income countries. Empowerment of the community at grass root level through effective advocacy, communication and social mobilization[26] is a crucial step to achieve the TB and HIV related millennium development goals [27].

To design effective behavioral intervention strategies, the level of prejudice and misconceptions of the community towards PLHA and patients with TB should be evaluated. Several studies about stigma and misconceptions among patients with TB [20,21,28-35] and PLHA [23,24,36,37] have been done previously. In Ethiopia, where more than 85% of the population reside in rural areas, very little is known about this subject. We conducted a quantitative and qualitative community based survey in a predominantly rural area of southwest Ethiopia to address this knowledge gap.

**Methods**

From February to March, 2009, a cross sectional community based survey was conducted in GGFRA located 260 Km southwest of Addis Ababa, the capital of Ethiopia. The GGFRA was established in 2005 to serve as a research center and field attachment site of Jimma University. The research centre comprises of eight rural and two urban Kebeles (lowest administration unit in Ethiopia) which are located around the reservoir of Gilgel Gibe hydroelectric dam. The total population of the field research center is 50156 with 10,859 households.

**Study Population**

The source population consisted of adults older than 14 years of age who lived in the 10 Kebeles of the GGFRA. From the source population, a total of 862 adults were proposed to be included for the quantitative survey by considering the following assumptions: prevalence of prejudice towards PLHA of 50%, 95%CI, margin of error of 3.5% and a non-response rate of 10%. The total sample size was proportionally distributed to the ten study Kebeles. In each Kebele, households were selected by simple random sampling using the unique household number. In a household, one adult person was selected randomly for the interview. To get the target study participants, households were visited repeatedly. If the respondent was not found in three visits, the next household was included to replace another respondent. Individuals younger than 15 years old or temporary residents were excluded from the study. To triangulate the findings of the quantitative survey, eight (4 among women and 4 among men) focus group discussions (FGD) were conducted. For each FGD, 8-10 individuals who were supposed to have adequate information were selected in consultation with the chairpersons of the study Kebeles.

**Measurements**

Quantitative data were collected by trained personnel who completed grade 12. They used pretested structured questionnaire. The questionnaire included socio-demographic variables, knowledge about HIV/AIDS (15 items), prejudice or stigma towards PLHA (10 items), knowledge concerning TB (5 items), prejudice towards a patient with TB (14 items) and health care seeking behavior of the community for TB. The knowledge and prejudice questions for HIV [38,39] and TB[20,38] were adopted from published questionnaires. The internal consistencies of the HIV and TB prejudice scales were 0.71 and 0.83 respectively.

Knowledge on the transmission of HIV was measured by 8 questions with yes/no responses: Is HIV transmitted by a mosquito/ fly?, by eating raw beef (a common tradition in Ethiopia) prepared by a person who lives with HIV?, by eating together with a patients with HIV?, from a pregnant woman to her child?, by breast feeding?, by eating an uncooked egg laid by a chicken which swallowed a used condom?, by unprotected sexual practice?, and through an injury by unsterile sharp objects? Prejudice about HIV was evaluated by 10 questions: should a person living with HIV/AIDS be isolated?; are you willing to share a meal with a person living with HIV/AIDS?, to buy food from a hotel owned by a person living with HIV/AIDS?, to take Anti-retroviral Treatment (ART)?; do you allow a family member to marry without an HIV counseling and testing?; do you believe an HIV positive student can continue his education?; do you believe an HIV infected teacher should pursue his/her work? The TB prejudice scale included the beliefs of the respondents on the isolation of TB patients; disclosure of TB to others; perception about the social, sexual and marital problems of TB patients. Based on these questions, the degree of prejudice on HIV and TB was scored. An answer consistent with prejudice towards HIV or TB was scored with one point. An answer not consistent with prejudice towards HIV or TB was scored as zero points. A total prejudice score for HIV or TB was created by summing the scores of all questions. The HIV prejudice score ranged from 0 to 10, with the higher the score, the greater the degree of prejudice towards HIV. Individuals who had a prejudice score of
equal to or greater than the mean score of the study population were categorized as having high prejudice towards HIV or TB. On the other hand, individuals who scored a prejudice score below the mean were categorized as having low prejudice towards HIV or TB. Since the prejudice scores of HIV and TB were normally distributed, the means were used to classify the study population as having high or low prejudice.

Similar scoring was done for the knowledge questions concerning HIV and TB. Qualitative data were collected by experienced public health and health education experts using FGD guides which consisted of stigma, knowledge, attitude, and health seeking behaviors of the community for TB.

Data analysis
Data were double entered using Epi-data version 3.1 (Epi-data, Norway, 2006). For analysis, the data were exported to SPSS version 16.0 statistical software (SPSS Inc. Chicago, 2007). Descriptive analysis was done to measure knowledge, stigma and health care seeking behavior. Pearson’s Chi-square was used to assess the association between socio-demographic variables and knowledge with prejudice. To control for the effect of confounding variables, stepwise logistic regression was done. Variables which had a statistically significant association (P < 0.05) in the Pearson’s Chi-square test were included in the final logistic regression model. All FGD interviews were transcribed by public health and health education experts immediately after the interview. The transcribed data were commented by the investigators. After several readings, key categories & themes were identified. The data were interpreted and presented verbatim.

Ethical considerations
The proposal was approved by the ethical review committees of Jimma University, Armauer Hansen research institute and the Institute of Tropical Medicine, Belgium. Written consent was obtained from the study participants.

Results
Socio-demographic characteristics of the study population
Of the 862 selected study participants, 750(87%) accepted to be interviewed; 112(13%) declined. Majority (70%) of those who refused to accept the interview were males. The mean age of the respondents was 31.2 (SD ± 11.0). Of the total interviewed individuals, 85.2%, 75% and 58% were Muslims, married and females respectively. Six hundred and forty five (86%) of the study participants were Oromo by ethnicity. The median monthly income of the individuals was 400 Ethiopian Birr (34 USD)/per month (Table 1).

| Variable                  | Number (%) |
|---------------------------|------------|
| Sex                       |            |
| Male                      | 315 (42)   |
| Female                    | 435 (58)   |
| Literacy status           |            |
| Literate                  | 290 (38.3) |
| Non-literate              | 460 (61.7) |
| Age in years              |            |
| 15-24                     | 216 (28.8) |
| 25-34                     | 250 (33.3) |
| 35-44                     | 164 (21.9) |
| >=45                      | 120 (16.0) |
| Mean age (SD)             | 31.2 (±11.0) |
| Religion                  |            |
| Muslim                    | 639 (85.2) |
| Orthodox Christian        | 95 (12.7)  |
| Protestant                | 16 (2.1)   |
| Ethnicity                 |            |
| Oromo                     | 645 (86.0) |
| Yem                       | 42 (5.6)   |
| Amhara                    | 32 (4.3)   |
| Gurage                    | 17 (2.3)   |
| Keffa                     | 5 (0.7)    |
| Dawro                     | 3 (0.4)    |
| Tigre                     | 2 (0.2)    |
| Other                     | 4 (0.5)    |
| Occupation                |            |
| Farmer                    | 372 (49.6) |
| Housewives                | 184 (24.5) |
| Government employee       | 69 (9.2)   |
| Day laborers              | 25 (3.3)   |
| Student                   | 41 (5.5)   |
| Merchant                  | 47 (6.3)   |
| No job                    | 12 (1.6)   |
| Marital status            |            |
| Married                   | 563 (75.1) |
| Single                    | 125 (16.7) |
| Divorced                  | 24 (3.2)   |
| Widowed                   | 38 (5.1)   |
| Monthly Income            |            |
| <400 Ethiopian Birr (<34 USD) | 410 (58.0) |
| =>400 Birr (=>34 USD)     | 297 (42)   |
| Area of residence         |            |
| Rural                     | 531 (70.8) |
| Urban                     | 219 (29.1) |
Knowledge and perception towards HIV/AIDS
Almost all of the study participants (97.5%) had heard of HIV/AIDS. More than half of the respondents did not know the possibility of transmission of HIV from a mother to a child or by breast milk. A larger proportion of non-literate individuals were more likely to have misconceptions about transmission of HIV than literates (Table 2).

The majority of the FGD participants believed that HIV/AIDS is a punishment from God for unacceptable human sexual behavior.

"These days, extramarital sexual practices are becoming more common. As a punishment for this sexual infidelity, Rabbi/God has given the human being an incurable disease called AIDS". A 50 years old Muslim in a rural Kebele.

The majority of the male FGD participants described that unprotected sexual practices with multiple partners such as polygamous marriage in their village could play a major role for the transmission of HIV/AIDS. On the other hand, the majority of the female participants believed that the mosquito that transmits malaria and flies could transmit the virus. The role of flies as a transmission agent for HIV was exemplified by a 35 years old woman:

"Flies can transmit AIDS from an HIV infected person’s wound to a healthy person. Fortunately, in our village, there are no patients with HIV who could transmit the disease to us.”

Table 2: Perception of the study participants concerning the cause of HIV/AIDS (n = 731), southwest Ethiopia

| Indicators of conception                                               | sex                  | P-value | Literacy status | P-value |
|-----------------------------------------------------------------------|----------------------|---------|----------------|---------|
|                                                                       | Male No(%)           | Female No(%) | Non-literate No(%) | Literate No(%) |         |
| Vector can transmit HIV                                                | 0.02                 | 0.001   |
| Yes                                                                  | 20(6.4)              | 46(11.0) | 53(12.0)       | 13(4.5)     |
| No                                                                   | 294(93.6)            | 371(89.0) | 389(88.0)   | 276(95.5)   |
| Eating uncooked egg laid by a chicken that swallowed a used condom can transmit HIV | 0.23                 | 0.15    |
| Yes                                                                  | 70(22.3)             | 78(18.7) | 82(18.6)       | 66(22.8)    |
| NO                                                                   | 244(77.7)            | 339(81.3) | 360(81.4)   | 223(77.2)   |
| Eating raw meat prepared by a person who lives with HIV can transmit HIV | 0.83                 | 0.08    |
| Yes                                                                  | 62(19.7)             | 85(20.4) | 98(22.2)       | 49(17.0)    |
| No                                                                   | 252(80.3)            | 332(79.6) | 344(77.8)   | 240(83.0)   |
| Eating together with an HIV infected person can transmit HIV          | 0.04                 | 0.004   |
| Yes                                                                  | 23(7.3)              | 49(11.8) | 55(12.4)       | 17(5.9)     |
| NO                                                                   | 291(92.7)            | 368(82.2) | 387(87.6)   | 272(94.1)   |
| Unsterile syringes and sharp objects can transmit HIV                 | 0.15                 | 0.08    |
| Yes                                                                  | 298(94.9)            | 383(91.8) | 406(91.9)   | 275(95.2)   |
| NO                                                                   | 16(5.1)              | 34(8.2)  | 36(8.1)       | 14(4.8)     |
| Breast feeding can transmit HIV to the baby                          | 0.59                 | 0.005   |
| Yes                                                                  | 138(43.9)            | 175(42.0) | 171(38.7)   | 142(49.1)   |
| NO                                                                   | 176(56.1)            | 242(58.0) | 271(61.3)   | 147(50.9)   |
| HIV can be transmitted from mother to child during pregnancy and labor | 0.73                 | 0.001   |
| Yes                                                                  | 138(43.9)            | 178(42.7) | 168(38.0)   | 148(51.2)   |
| NO                                                                   | 176(56.1)            | 239(57.3) | 274(62.0)   | 141(48.8)   |
| Unprotected sex can transmit HIV                                      | 0.09                 | 0.004   |
| Yes                                                                  | 263(83.8)            | 329(78.9) | 343(77.6)   | 249(86.2)   |
| NO                                                                   | 51(16.2)             | 88(21.1)  | 99(22.4)     | 40(13.8)    |
Prejudice towards HIV/AIDS

One hundred and seventy six (24%) participants had high prejudices towards PLHA. A higher proportion of females [OR = 1.5, (95% CI: 1.0, 2.2)], non-literate individuals [OR = 2.3, (95%CI: 1.4, 3.6)], rural residents [OR = 3.8, (95%CI: 2.2, 6.6)], individuals who had poor knowledge on HIV/AIDS [OR = 2.8, (95%CI: 1.8, 2.2)] and individuals with lower income [OR = 1.7,(95%CI:1.1,2.6)] had high prejudice towards PLHA than respectively males, literates, urban residents, individuals who had good knowledge and a higher income (Table 3).

HIV/AIDS was a highly stigmatized disease in the community. Almost all of the FGD discussants described that people in their villages do not want to eat, drink, share utensils or clothes and participate in a social group such as "Iddir" with PLHA. Iddir (funeral insurance) is a community based organization whereby people contribute money or food regularly to support the family of a deceased individual. The major reason of stigma towards PLHA was the fear of transmission of the virus through direct contact. To substantiate this idea, a 42 years old woman said,

“In fact, there is nobody who is infected with ‘AIDS’ in our village. If there is one, nobody will dare to visit his/her house, eat together, shake hands and exchange materials like clothes and utensils.”

The idea of isolation and discrimination of PLHA from social groups was illustrated by a 36 years old woman:

“HIV infected person should not be a member of an Iddir. Nobody shakes hands with that person or touches the money contributed by him/her.”

Real example of discrimination against a person who was believed to have HIV/AIDS was discussed by the female FGD participants in one of the Kebeles.

“In our village there was a man who was very emaciated and developed sores in his mouth. We used to run and hide when we saw him for fear of the transmission of HIV by hand shaking. Currently, his health is improved and most of us are embarrassed to see his eye." A 36 years old woman at a rural Kebele

Utilization of voluntary counseling and testing and condom

Three hundred and thirty nine (45%) and 512(70.2%) participants had heard of ART and voluntary counseling and testing. Of those who knew HIV counseling and testing, 212 (28%) were tested at least once. Six hundred and thirty four (84.5%) individuals have heard of condoms. In the 12 months prior to the survey, 521(69.5%) of the study participants had sexual intercourse, 27(5.2%) with more than one partner. Only 1.3% of individuals who had one sexual partner and 11% of those who had multiple sexual partners had utilized a condom at least once in the last one year.

Knowledge and perception towards TB

A total of 708 (94.4%) participants had ever heard of TB. Literates had a much better knowledge about the cause, symptoms, and methods of transmission and prevention of TB than non-literate individuals (Table 4).

In the qualitative study, we identified different concepts of causation of TB. The majority of the FGD participants believed that TB was caused by exposure to cold air. A 43 years old man expressed the link between TB and cold air as:

"People contract TB when they are exposed to cold air. The cold air, particularly which comes through open window will cause severe injury to the lung; cough gradually develops which ultimately becomes TB.”

The qualitative findings revealed other causes of TB such as alcohol, Khat (natural stimulant from Catha edulis plant) and exchange of drinking and eating utensils with a TB patient. It was believed that locally made strong alcohol called ‘Katikala’ and Khat could cause TB through their direct toxic effect on the lung. Participants believed that TB patients should have separate eating plates and drinking cups since the microorganism could not be removed from the plate or dish by washing alone.

Prejudice towards TB

Three hundred and ninety nine (56%) individuals had high prejudice towards a patient with TB. A larger proportion of females and non-literate individuals had high prejudice than males and literate individuals (Table 5).

TB was considered a less stigmatized disease as compared to HIV/AIDS. On the other hand, a significant number of the FGD participants believe that TB and HIV have similar symptoms and people afraid of TB patients because of the associated HIV infection.

Health seeking behavior and perception on the quality of service of the health institution

A total of 49(6.5%) study participants had cough of 2 weeks or more during the survey and 23(46.9%) of them did not seek help in the health institutions or other places. Of those who had cough, 34.7% visited health centers is poor and people often do not visit them.

"People would prefer health facilities for the treatment of Samba. However, the poor quality of service in the health
Discussion

The results of this study reveal several misconceptions and prejudice towards PLHA and patients with TB. More than 50% of the participants in this study do not know the possibility of transmission of HIV from a mother to child or by breast feeding. This figure is higher than previous reports from Ethiopia[38,39]. However, less than 10% of the study population believe that HIV can be transmitted by a mosquito/fly which is lower than the misconception reported in the 2005 Ethiopian Demographic Health Survey (40%) and the Ethiopian behavioral surveillance survey (20%) [38,39]. These differences could be attributable to several factors including the population being studied and the study periods. Our study primarily focuses on rural residents who might have different culture and views concerning TB and HIV as compared to urban and adolescent population[39].

The study reveals high stigmatizing attitude and the existence of real discrimination against PLHA in the community. A larger proportion of rural residents,
females, non-literate individuals and those who have poor knowledge about HIV have high prejudice towards PLHA. This is consistent with the findings of a previous report in Ethiopia[38]. Inaccessibility of the HIV/AIDS interventions to the rural and disadvantaged segments of the population might explain the deep rooted prejudice in these communities. This prejudice can make PLHA reluctant to disclose their HIV status to their family[40,41]. PLHA may also suffer from verbal and physical abuse by the community and family members[42]. The low level of perception on the existence of HIV infection in the locality and the poor utilization of HIV/AIDS interventions such as condom and HIV counseling and testing will create a fertile ground for the rapid spread of HIV. On the other hand, the pervasive prejudice, discrimination of PLHA and low awareness concerning HIV/AIDS will be an important barrier for the HIV control program if it wants to expand ART to the grass root level and increase its uptake. Previous literatures had shown that low awareness and stigma were the major barriers for the free access of ART and other HIV/AIDS related cares[40,41,43]. The government of Ethiopia has launched Health Extension Program (HEP) to achieve the health related Millennium Development Goals (MDG)[44]. As part of the HEP, more than 30,000 health extension workers are trained. These health cadres are expected to provide a minimum preventive and promotive health packages to each household in a Kebele. HEP is a good opportunity for the TB/HIV control program to tackle the aforementioned challenge.

The majority (94%) of our study participants have heard of TB which is similar to other reports[33,34]. However, more than 50% of females and non-literate individuals do not know the cause of TB. Misconceptions concerning

| Indicators of conception | Sex | P-value | Literacy status | P-value |
|--------------------------|-----|---------|----------------|---------|
|                          | Male | Female | Non-literate | Literate |
|                          | No (%) | No (%) | No (%) | No (%) |
| **Ever heard of TB (n = 750)** | 0.07 | 0.001 |
| Yes | 303(96.2) | 405(93.1) | 422(91.7) | 286(98.6) |
| No | 12(3.8) | 30(6.9) | 38(8.3) | 4(1.4) |
| **Cause of TB (n = 708)** | 0.6 | 0.001 |
| Microorganism | 147(48.5) | 204(50.4) | 170(40.3) | 181(63.3) |
| Not microorganism | 156(51.5) | 201(49.6) | 252(59.7) | 105(36.7) |
| **Methods of Transmission of TB (n = 708)** | |
| Contaminated food and water | 56(18.5) | 71(17.5) | 0.7 | 80(19.0) | 47(16.4) | 0.4 |
| Through air during coughing and sneezing | 276(91.1) | 370(91.4) | 0.9 | 371(87.9) | 275(96.2) | 0.001 |
| Unsterile milk | 25(8.3) | 36(8.9) | 0.8 | 21(5.0) | 40(14.0) | 0.001 |
| Poor personal hygiene | 21(6.9) | 20(4.9) | 0.6 | 20(4.9) | 17(4.0) | 0.2 |
| **Symptoms of TB (n = 708)** | |
| Cough of 2 or more weeks | 239(79.7) | 315(77.8) | 0.5 | 322(76.5) | 232(81.7) | 0.09 |
| Fever | 90(29.7) | 135(33.3) | 0.3 | 116(27.5) | 109(38.1) | 0.003 |
| Weight loss/becoming thin | 143(47.2) | 158(39.0) | 0.029 | 162(38.4) | 139(48.6) | 0.007 |
| Hemoptyis | 171(56.4) | 219(54.0) | 0.5 | 222(52.6) | 168(58.7) | 0.5 |
| Excessive night sweating | 60(19.8) | 61(15.1) | 0.09 | 58(13.7) | 63(22.0) | 0.004 |
| Chest pain | 62(20.5) | 60(14.8) | 0.05 | 72(17.1) | 50(17.5) | 0.8 |
| Shortness of breath | 63(20.8) | 53(13.1) | 0.006 | 73(17.3) | 43(15.0) | 0.4 |
| Poor appetite | 63(20.8) | 54(13.3) | 0.02 | 54(12.8) | 63(22.0) | 0.002 |
| **Prevention of TB (n = 708)** | |
| Cover mouth during coughing or sneezing | 238(78.8) | 306(76.1) | 0.5 | 316(75.6) | 228(79.7) | 0.3 |
| Proper disposal of sputum | 180(59.6) | 243(60.4) | 0.6 | 229(54.8) | 194(67.8) | 0.002 |
| Ventilation of houses | 60(20.5) | 63(15.7) | 0.2 | 56(13.4) | 69(24.1) | 0.001 |

### Table 4: Perception of the participants on the cause, method of transmission and prevention of Tuberculosis in southwest Ethiopia
the cause of TB such as cold air and locally made brew[31] and lack of awareness on the major symptoms of TB can lead to a significant delay to seek help from health institutions. Less than 20% of the non-literates and females know ventilation and proper disposal of sputum as prevention methods of TB. Lack of awareness on the major modes of transmission of TB can be a potential hurdle for effective TB control in the community. The availability of two health extension workers in each Kebele can be a good opportunity to educate the rural community about TB.

The level of high prejudice towards TB in this study (56%) was lower compared to a report from China (89%)[33] and Thailand(65%)[45]. A higher proportion of females and non-literate individuals had prejudice towards a patient with TB which is consistent with other reports elsewhere[20,32,33,45]. The high level of public prejudice can affect the health care seeking behavior of TB patients[35,45]. Dissatisfaction of the community with the services of the health institutions was the major reason for not seeking help in the health institutions. The widespread prejudice, misconceptions, and the negative attitude of the community on the quality of care of the health institutions will be serious barriers for the TB control program to increase the low case detection rate(i.e. 27%) of pulmonary TB in the study area[3].

Despite the use of triangulation methods, the study has some limitations. First, the study was conducted in a predominantly rural population which might not be representative of the whole population of Ethiopia. Second, we did not do an assessment on the quality of care of the health institutions to triangulate the findings of the qualitative study. Third, we did not include TB or HIV patients to assess the real stigma and discrimination on patients’ perspective.

**Conclusions**

In conclusion, widespread prejudice (stigmatizing attitude) towards PLHA and patients with TB, misconceptions on the modes of transmission of HIV and TB and a negative perception of the quality of health services can be serious bottlenecks for the TB/HIV control programs to achieve the TB and HIV related millennium development goals (MDGs). TB/HIV control programs in collaboration with other partners should invest more in social mobilization and education of rural communities to rectify this. Enhanced HEP (by giving additional training for the HEW on TB and HIV) and outreach education campaign by trained health workers can be used as strategies to educate the rural community.

**Competing interests**

The authors declare that they have no competing interests.

**Authors’ contributions**

AD was involved in the conception and design of the study, coordinated the field work, analyzed the data and drafted the manuscript. GA was involved in the conception, design of the study, field work and review of the article. LA

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**Table 5: Factors associated with prejudice towards a patient with tuberculosis (n = 708), southwest Ethiopia**

| Variables | Prejudice towards TB patient | Crude OR (95% CI) | Adjusted OR (95%CI) |
|-----------|-----------------------------|-------------------|---------------------|
|           | High | Low |                   |                   |                   |
| **Sex, no (%)** |                  |                  |                   |                   |
| Male      | 156(51.5) | 147(48.5) | 1                   | 1                   |
| Female    | 243(60.0) | 162(40.0) | 1.4(1.0,1.9)*       | 1.3(1.0, 1.9)*     |
| **Literacy status, no (%)** |                  |                  |                   |                   |
| Literate  | 146(51.0) | 140(49.0) | 1                   | 1                   |
| Non-literate | 253(60.0) | 169(40.0) | 1.4(1.0,1.9)*       | 1.4 (1.1, 2.0)*    |
| **Age in years, no (%)** |                  |                  |                   |                   |
| 15-24     | 120(59.1) | 83(40.9)  | 0.8(0.5,1.3)        | *                   |
| 25-30     | 133(55.9) | 105(44.1) | 0.7(0.4,1.1))       |                   |
| 35-44     | 73(47.4)  | 81(52.6)  | 0.5(0.3,0.8)*       |                   |
| >=45      | 73(64.6)  | 40(35.4)) | 1                   | *                   |
| **Residence, no (%)** |                  |                  |                   |                   |
| Urban     | 108(50.9)| 104(49.1) | 1                   | *                   |
| Rural     | 291(58.7) | 205(41.3)| 1.4(0.9,1.8)        |                   |

*Excluded in the final model
was involved in the design and reviewed the article. CJ, MT, JS, AA, KW, FD, MB, and AA participated in the design, field work and reviewed the article. RC critically reviewed and approved the article. All authors read and approved the final manuscript.

Acknowledgements

The study was funded by the Flemish Institution University Cooperation (IUC) program. The authors appreciate the study participants for their cooperation in providing the necessary information.

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Received: 26 March 2010 Accepted: 6 July 2010

Published: 6 July 2010

References

1. WHO: Global tuberculosis control, 2009:96-32 [http:// whqlibdoc.who.int/publications/2009/9789241598886_eng.pdf]. WHO
2. Ministry of Health: TB, leprosy and TB/HIV prevention and control program manual. Addis Ababa, Ethiopia, 2000.
3. Ministry of Health: Proceedings of the fifth National TB workshop in Jimma University, Ethiopia, 2009.
4. Kassu A, Mengistu G, Ayale B, Dero E, Melkonnen F, Ketema D, Moges F, Mesfin T, Getachew A, Ergicho B, et al.: Coinfection and clinical manifestations of tuberculosis in human immunodeficiency virus-infected and -uninfected adults at a teaching hospital, northwest Ethiopia, J Microbiol Immunol Infect 2007, 40(2):116-122.
5. Ayenew A, Leykun A, Colebunders R, Deribew A: Predictors of HIV testing among tuberculosis patients in North West Ethiopia: a case-control study, PLoS ONE 5(3):e9702.
6. Datiko DG, Yassin MA, Chekol LT, Kabeto LE, Lindtjorn B: The role of TB-HIV co-infection depends on the prevalence of HIV infection in a community., BMC Public Health, 2008, 8:266.
7. Bruchfeld J, Aderay G, Palme IB, Bjorvatn B, Britton S, Feleke Y, Kallenius G, Lindquist L: Evaluation of outpatients with suspected pulmonary tuberculosis in a high HIV prevalence setting in Ethiopia: clinical, diagnostic and epidemiological characteristics., Scand J Infect Dis 2002, 34(5):331-337.
8. Yassin MA, Takele L, Gebreabentset S, Girma E, Lera M, Lendoeb E, Cuevas LE: HIV and tuberculosis coinfection in the southern region of Ethiopia: a prospective epidemiological study., Scand J Infect Dis 2004, 36(9):670-673.
9. Saganthi P, Chadha VK, Ahmed J, Umadevi G, Kumar P, Srivastava R, Magesh V, Gupta J, Sharda MA: Health seeking and knowledge about tuberculosis among persons with pulmonary symptoms and tuberculosis cases in Bangalore slums., Int J Tuberc Lung Dis 2008, 12(11):1268-1273.
10. Chomat AM, Wilson IB, Wanke CA, Selvakumar A, Cucheran A, Maganani MM, Batsfei F: Adherence to antiretroviral therapy for human immunodeficiency virus/acquired immune deficiency syndrome among drug users: a systematic review., Addiction 2008, 103(8):1242-1257.
11. Kempf MC, Psu M, Durncheva A, Westfall AO, Kilby JM, Saag MS: Gender differences in discontinuation of antiretroviral treatment regimens., J Acquir Immune Defic Syndr 2009, 52(3):336-341.
12. Malta M, Strathdee SA, Maganani MM, Batsfei F: Adherence to antiretroviral therapy for human immunodeficiency virus/acquired immune deficiency syndrome among drug users: a systematic review., Addiction 2008, 103(8):1242-1257.
13. Daniel OJ, Alusa DA: Treatment outcome of TB/HIV positive and TB/HIV negative patients on directly observed treatment, short course (DOTS) in Sagamu, Nigeria., Niger J Med 2006, 15(3):222-226.
14. Pindiyaphatirage J, Senarathne W, Wickremasinghe R: Prevalence and predictors of default with tuberculosis treatment in Sri Lanka., Southeast Asian J Trop Med Public Health 2008, 39(6):1076-1082.
15. Jaggarajan K, Sudha G, Chandrasekaran V, Nirup J, Thomas A, Santha T, Muniyandi M, Narayanan PR: Reasons for non-compliance among patients treated under Revised National Tuberculosis Control Programme (RNTCP), Tiruvallur district, south India., Indian J Tuberc 2007, 54(3):130-135.
16. Somma D, Thomas BE, Karim F, Kemp J, Arias N, Auer C, Gosoniu GD, Abouiala A, Weiss MG: Gender and socio-cultural determinants of TB-related stigma in Bangladesh, India, Malawi and Colombia., Int J Tuberc Lung Dis 2008, 12(7):656-666.
17. Dodor EA, Kelly S: ‘We are afraid of them’: attitudes and behaviours of community members towards tuberculosis in Ghana and implications for TB control efforts., Psychol Health Med 2009, 14(2):170-179.
18. Baral SC, Karli DK, Newell JN: Causes of stigma and discrimination associated with tuberculosis in Nepal: a qualitative study., BMC Public Health 2007, 7:211.
19. Aga F, Kylma J, Nannonen M: Sociocultural factors influencing HIV/AIDS caregiving in Addis Ababa, Ethiopia., Nurs Health Sci 2009, 11(3):244-251.
20. Cloete A, Simbayi LC, Karlchman SC, Stebel A, Henda N: Stigma and discrimination experiences of HIV-positive men who have sex with men in Cape Town, South Africa., AIDS Care 2008, 20(9):1105-1110.
21. Visser MJ, Makin JD, Vandomme A, Sikkema KJ, Forsyth BW: HIV/AIDS stigma in a South African community., AIDS Care 2009, 21(2):197-206.
22. WHO: Stop TB partnership. The Global Plan to Stop TB, 2006-2015. In WHO/HTM/STB/2006.35 WHO, 2006.
23. WHO: Millennium Development Goals, the health indicators: scope, definition and measurement methods. WHO/EHP/HPS/03.2003.
24. Atre S, Kudale A, Moranker R, Gosoniu D, Weiss MG: Gender and community views of stigma and tuberculosis in rural Maharashtra, India., Glob Public Health 2009, 1-16.
25. Hoa NP, Dwan VK, Co CV, Thorson AE: Knowledge about tuberculosis and its treatment among new pulmonary TB patients in the north and central regions of Vietnam., Int J Tuberc Lung Dis 2004, 8(5):603-608.
26. Sharma N, Malhotra R, Taneja DK, Saha R, Ingle GK: Awareness and perception about tuberculosis in the general population of Delhi., Asia Pac J Public Health 2007, 19(2):10-15.
27. Mangesho PE, Shayo E, Makunde WH, Keto GB, Mandara CI, Kamugisha ML, Kilele AM, Ishengoma DR: Community knowledge, attitudes and practices towards tuberculosis and its treatment in Mpwapwa district, central Tanzania., Tanzan Health Res Bull 2007, 9(1):38-43.
28. Mushraq MJ, Majrooh MA, Ahmad W, Rizwan M, Lugaan MQ, Aslam MJ, Siddiqui AM, Akram J, Shad MA: Knowledge, attitudes and practices regarding tuberculosis in two districts of Punjab, Pakistan., Int J Tuberc Lung Dis 14(3):303-310.
29. Lu SH, Tian BC, Kang XP, Zhang W, Meng XP, Zhang JB, Lu SH: Public awareness of tuberculosis in China: a national survey of 69.253 subjects., Int J Tuberc Lung Dis 2009, 13(12):1493-1499.
30. Mesfin T, Tasee T, Tareke I, Mulugeta G, Richard M: Community knowledge, attitude and practices on pulmonary tuberculosis and thier choice of treatment in Tigray, north Ethiopia., Ethiop J Health Dev 2005 2005, 19:12-27.
31. Cramm JM, Finkenflugel HJ, Moller V, Nieboer AP: TB treatment initiation and adherence in a South African community influenced more by perceptions than by knowledge of tuberculosis., BMC Public Health 2010, 10:22.
38. Central Statistical Authority: Ethiopia Demographic and Health Survey 2005. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ORC Macro; 2006:PI79-199.
39. Ministry of Health, Ethiopia: Behavioral Surveillance Survey 2005. Addis Ababa, Ethiopia; 2006:PS2-73.
40. Wolfe WR, Weiser SD, Bangsberg DR, Thior I, Makhema JM, Dickinson DB, Mompati KF, Martlink RG: Effects of HIV-related stigma among an early sample of patients receiving antiretroviral therapy in Botswana. AIDS Care 2006, 18(8):931-933.
41. Skinner D, Mfecane S: Stigma, discrimination and the implications for people living with HIV/AIDS in South Africa. Sahara J 2004, 1(3):157-164.
42. Dlamini PS, Kohi TW, Uys LR, Phetlhu RD, Chinwa ML, Naidoo JR, Holzemer WL, Greeff M, Makoeae LN: Verbal and physical abuse and neglect as manifestations of HIV/AIDS stigma in five African countries. Public Health Nurs 2007, 24(5):389-399.
43. Chakrapani V, Newman PA, Shunmugam M, Kurian AK, Dubrow R: Barriers to free antiretroviral treatment access for female sex workers in Chennai, India. AIDS Patient Care STDS 2009, 23(11):973-980.
44. Ministry of Health, Ethiopia: Health Extension Program in Ethiopia. Federal Ministry of Health, Addis Ababa, Ethiopia; 2007.
45. Jittimanee SX, Nateniyom S, Kittikraisak W, Burapat C, Akosel S, Chumpathat N, Sirinak C, Sattayawuthipong W, Varma JK: Social stigma and knowledge of tuberculosis and HIV among patients with both diseases in Thailand. PLoS One 2009, 4(7):e6360.

Pre-publication history
The pre-publication history for this paper can be accessed here: http://www.biomedcentral.com/1471-2458/10/400/prepub

doi: 10.1186/1471-2458-10-400
Cite this article as: Deribew et al., Prejudice and misconceptions about tuberculosis and HIV in rural and urban communities in Ethiopia: a challenge for the TB/HIV control program BMC Public Health 2010, 10:400

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