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Assessment Of Knowledge And Practices Related To Tuberculosis And Associated Factors Among HIV Positive People In Addis Ababa, Ethiopia

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ABSTRACT

Problem statement: TB and HIV have lethal combination making the fight against the diseases harder. Ethiopia is one of the highly affected countries in the world. Poor knowledge & practice of people on TB is believed to pose major challenge on the control program.Objective: The main objective of this study was to assess the knowledge, associated factors to knowledge and practice related to tuberculosis of HIV positive people living in Addis Ababa. Methods: A health facility based cross-sectional survey using a structured & pretested questionnaire was conducted from January to February, 2011 on PLHIV in Addis Ababa. The study subjects were selected by multistage probability sampling. Univariate, Bivariate and multivariate logistic regression analysis was done. Results: Complete data was collected from 636 study subjects, response rate of 96.2%. Out of which 624 (98.1 %; 95%CI: 96.8%-98.9%) have heard about TB and 50.2% (95% CI: 46.3%-54.0%) were found to have satisfactory overall knowledge on TB. Those who have Primary education [Adjusted OR (95%CI) = 1.74 (1.15, 2.62)] and secondary & above [Adjusted OR (95%CI) = 4.08 (2.62, 6.35)] were highly likely to have satisfactory knowledge than illiterates. Of the 624 respondent, 64.1% didn't often open windows of cars during travel. Of those who had pulmonary TB (194), 22.7% didn't cover mouth & nose during coughing and sneezing & their main reason was "not giving attention". From those who got medical treatment for TB (228), 14.5% didn't complete it and from those who took preventive treatment (231), 8.7% didn't complete it. The frequently mentioned reason was drug side effect. The intended health seeking practice was 96.8%. Conclusion and Recommendation: This study suggests that PLHIV in Addis Ababa have some gaps in knowledge and acceptable practices. Therefore, a very clear and target oriented health promotion, that takes illiterates in to consideration, for the PLHIV is necessary.Aims and Objectives- To know the most common type of calcanei in North Indian population and itsclinical importance. There are three articular facets on superior surface of calcaneus- anterior, middle andposterior. Three types of calcanei are noted according to number and arrangement of the articular facets-type A, B and C. Methodology - The present studywas done on 300 dry adult human calcanei of unknownsex taken from Department of Anatomy Sri Guru Ram Das Institute of Medical Sciences and ResearchVallah (Amritsar). Results- In our study Type B was found as the most common type. Type A is the nextmost common. Interpretation- The talocalcaneal joint is important in arthritis and coalition, flat foot, valgus deformity, congenital anomalies and intra articular fractures.

KEY WORDS- knowledge, HIV, tubersculosis

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Introduction

Tuberculosis (TB) and Human Immunodeficiency Virus (HIV) are the world widely recognized high burden infectious diseases. They do have synergic effect that posed major challenge to the control efforts done to the diseases globally. The co-infection is particularly common in developing world (1). Africa takes the lion share of the co-infection burden. Approximately 80% of the HIV-positive TB incident cases in 2009 were in Africa region (2). Ethiopia is one of the highly affected countries by the TB/HIV co-epidemic. In 2009, 17% of the new cases of TB in

the country were among HIV positive people (2).
Raising knowledge and practice of communities on TB is found to be key action to help bring the TB disease under control. Community's interest and willingness to demand better quality health service for TB is insured by raising knowledge and attitude of the community.This will reduce onward transmission, improve health and saves lives (3).

Lack of knowledge and practice on TB has impact on high transmission, delayed health seeking behaviour & treatment adherence. This poor practice of community on TB leads to persistent infectiousness, drug resistance, treatment failure, relapse & death (3, 4). Not educating community about TB is identified as one contributor of failure of TB control, particularly in Africa (3).

Even though there are some TB Knowledge, Attitude & Practice studies done in different communities of Ethiopia (5-8), the gap and associated factors of HIV infected people, the most vulnerable group, is not studied particularly. This study was initiated to assess the gap in knowledge & practice on tuberculosis of PLHIV and the associated factor to the knowledge.

Material and Methods

Study Area and period: The study was conducted in Addis Ababa, the capital city of Ethiopia from January - February 2011.

Study Design*:* A health facility based cross-sectional survey was conducted.

Source Population: All people living with HIV/AIDS in Addis Ababa during the study period. PLHIV getting comprehensive (chronic) HIV/AIDS care service in the different health centres in the city were the study population. Study subjects were then selected using probability sampling technique from the study population. PLHIV in the study population, who were 18 years and above were included in the sampling technique while those visiting the health centers more than once within the study period were excluded except for their first visit.

Sample size: The sample size was calculated using a single population proportion formula by taking the proportion of satisfactory knowledge of community on TB 53% from a study in Tigray (9) and considering assumptions of 95% confidence, 5% level of precision and design effect of 1.5 and 15% non response rate. The calculated sample size was 661 persons.

Sampling Technique*:* A multistage probability sampling technique was used to select study subjects. From the health centers found in the city, 10 were selected (one from each sub-city) using lottery method. Based on last months' client flow of the selected health centers, expected number of clients in the data collection period was calculated (6236). Sample size was divided to the health centers based on their patient load. Starting from 5th client (random start) on the first day of data collection every 9th client (N/n= 6236/661) was interviewed

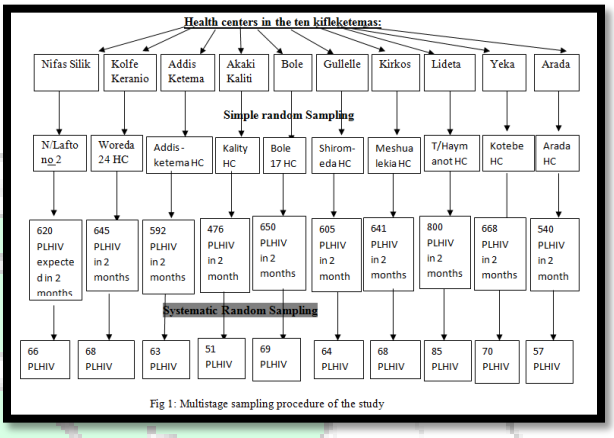

Fig 1: Multistage sampling procedure of the study

Operational definitions:

- **Tuberculosis:** when active TB affects the lungs and causes a persistent cough (sometimes with bloody sputum), chest pain, exhaustion, night sweets, fever, loss of appetite, weight loss and shortness of breath.
- **Knowledge**: in this study, it was measured based on respondent's ability to respond to 15 questions about TB (this include; cause, infectiousness, seriousness, transmission, prevention, sign & symptoms, curability, free TB detection/treatment policy, consequences of stopping treatment, how TB is cured, high risk of PLHIV to TB & preventive therapy to latent TB for PLHIV). The respondents' median overall knowledge score was used as a cut-off point to determine knowledge level. Respondents who scored less than the median score were considered as having low knowledge & those who score equal to or greater than the median considered as having satisfactory knowledge
- **Practice:** in this study was the actual/intended actions related to TB respondents were taking in different situations and conditions.

Data collection: Interviewer administered structured and pretested questionnaire adapted from WHO guideline for TB KAP survey with some amendments was used (4). Data on Socio-demographic & economic variables, Previous TB history & TB knowledge &

practice were collected. There were 10 data collectors who were mainly nurses and health officers who work in the comprehensive HIV/AIDS care rooms of the respective HCs. In some HCs however, the case managers in the room were the data collectors. Professionals at the care rooms were selected for data collection in order to avoid problem of discloser of HIV status. Data was collected in working days from January 3 to February 28, 2011. Only one of the health workers at the HIV/AIDS care room of each HC were assigned for data collection so there was no interference with the daily service. The patients who were willing to participate have spent 15-20 minutes of their time for the interview. Data quality was maintained by pre-testing the Amharic version questionnaire on 5% of the sample size. Standard training was given for the data collectors and supervisors in advance. Daily supervision and checking of data completion was also done by three supervisors.

Data processing and Analysis*:* Data was entered in to Epi Info version 3.5.1 and cleaned. It was then transferred to SPSS version 15.0 for analysis. Univariate analysis was done to determine their characteristics, knowledge and practice of the sample population. For the 15 knowledge related questions, '1' was coded for correct answers & '0' for non correct. Using the median score as a cut off, those who scored less than the median were considered to have low knowledge and labelled '0' and those who scored equal or greater than median were considered to have satisfactory knowledge and labelled '1'. Bivariate and multivariate analysis was done to determine the association of knowledge with the independent variables.

Ethical Considerations: Ethical clearance was obtained from Haramaya University and Addis Continental Institute of Public Health research review board. Permission to conduct the study was also obtained from Addis Ababa Health Bureau & the Health Centers. Signed consent was obtained from respondents prior to data collection. All information is secured to maintain confidentiality and no linking information including names of respondents was recorded to insure anonymity.

Results

Socio-demographic Characteristics*:* A total of 636 PLHIV are included in this study. The response rate was 96.2%. The age of respondents ranged from 18 to 68 years with a mean age of 33.34 (±8.06 SD) years. Of the respondents 67.5% of them were females and 31.1% were illiterates. Their median income was 350 birr. A detailed characteristic of the study participants is shown in Table 1.

Table 1: Socio demographic characteristics of the study subjects, Addis Ababa, 2011

Socio - demographic & economic characters	Number (%) (n=636)
Age of respondents	
<=27	152 (23.9)
28-32	186(29.2)
33-37	120 (18.9)
>= 38	178 (28.0)
Sex of respondents	
Male	207 (32.5)
Female	429 (67.5)
Educational status	
Illiterates	201 (31.6)
Primary Education	213 (33.5)
Secondary Education and above	222 (34.9)
Current employment status	
Have paid employment	381 (59.9)
Don't have paid employment	255 (40.1)
Income	
<= 200 Birr/month	194(30.5)
201-400 Birr/month	186(29.2)
401-600 Birr/month	122(19.2)
>=601 Birr/month	134(21.1)

Over all Knowledge on TB*:* Out of the 636 respondents, 624 (98.1%, (95%CI: 96.8%-98.9%)) of them have ever heard of TB from different sources. The overall respondents' knowledge score computed with a maximum of 15 scores. The mean and median score of respondents were 9.23(61.5%) & 10(66.7%) respectively. Using the median score as a cutoff point respondents' were categorized as having satisfactory (50.2%; 95%CI: 46.3%-54.0%) and low (49.8%; 95%CI: 46.0%-53.7%) tuberculosis knowledge. Health workers, Radio and TV were the first three preferable sources of information for the future.

Knowledge on Cause, Sign and Symptoms, Transmission & Prevention of TB

Only a quarter (24.2%) reported that bacteria/germ caused TB & 75.8% mentioned non biomedical causes or don't know any. Productive cough, cough for longer than two weeks and weight loss were highly mentioned as symptoms/signs of TB by 65.3%, 52.2% and 39.0% of respondents respectively.

Majority (95.4%) knew TB is infectious disease and 91.2% knew it has aerosol transmission. Less than half of respondents mentioned ventilation as a method of prevention of TB. Only 7.9% knew opening car windows as prevention method. Table 2 below shows the related responses in detail.

Knowledge on treatment, Risk and Seriousness of TB

Most (95.4%) said TB is curable and 82.4% knew TB in PLHIV is curable. Some (9.7%) of them mentioned non biomedical cures while 4.7% don't know any cure. Only 16.8% mentioned MDR TB as possible consequence of stopping TB drugs. A bit more than half (53.3%) knew the presence of preventive therapy to TB for PLHIV. More than a quarter (27.5%) didn't know the free TB diagnosis & treatment policy of Ethiopia. Less than half (45.4%) of respondents knew PLHIV are at higher risk for TB. Majority (85.8%) of them considered TB as very serious disease & 78.9% considered it as very serious problem for Ethiopia. Some details of these responses are shown on Table 3.

Table 2: Responses of PLHIV regarding cause, sign and symptoms, transmission & prevention of TB, Addis Ababa, 2011

Knowledge Variable	Number (%)(n=636)
Cause of TB	
Bacteria/ germ	154 (24.2)
Cold air	217(34.1)
Other non biomedical causes	138 (21.7)
Don't know	127(20.0)
Sign and Symptoms of TB	
Coughing with sputum	415(65.3)
Cough that lasts longer than two(2) week	332(52.2)
Blood in sputum	89(14.0)
Fever for over two (2) weeks	146(23.0)
Loss of appetite	231(36.3)
Weight loss	248(39.0)
Night sweating	160(25.2)
Chest pain	117(18.4)
Shortness of breath	55(8.6)
Generalized body weakness	157(24.7)
Don't know	34(5.4)
Others	25(3.9)
TB is contagious disease	
Yes	607 (95.4)
No/Don't know	29 (4.6)
Transmission of TB	
Through the air when infected perso n coughs or sneezes	580(91.2)
Through blood contact	22(3.5)
Sexually transmitted	14(2.2)
Sharing drinking and eating utensils	58(9.1)
Don't know	34(5.4)
Others	23(3.6)
Ways to prevent getting TB	
Through good nutrition	153(24.1)
Allow fresh air to flow freely	254(39.9)
Helping people infected with TB to get treatment quickly	218(34.4)
Don't know	112(17.6)
Others	30(4.7)
Ways to prevent infecting others	
Covering mouth and nose when cou ghing or sneezing	512(80.5)
Opening window & doors to allow f resh air flow freely	248(39.0)
Opening windows of cars during tra vel	50(7.9)
Disposing sputum properly	230(36.2)
Getting treatment quickly	185(29.1)
Taking anti TB drug properly	93(14.6)
Separate eating and drinking materi als	69(10.8)
Don't know	32 (5.0)
Others	22(3.5)

Table 3: TB treatment, seriousness & risk related responses of PLHIV, Addis Ababa, 2011

Knowledge Variable	Total sample (n=6 36) Number (%)
TB is curable disease	
Yes	607(95.4)
No/Don't know	29(4.6)
TB in PLHIV is curable	
Yes	524(82.4)
No/Don't know	112(17.6)
TB is cured by	
Home rest without medicin e	12(1.9)
Holy water/ other traditiona l medicine	25(3.9)
Drugs given by health instit	593(93.2)

utions	
Don't know	30(4.7)
Others	25(3.9)
Know presence of preventive treatment to TB for PLHIV	
Yes	339(53.3)
No	297 (46.7)
Consequence of stopping/not finishing TB drug	
No problem	10(1.6)
May develop drug resistant TB/MDR TB	107(16.8)
Relapse will occur	316(49.7)
The disease may worsen	425(66.8)
Don't know	29(4.6)
Others	2(0.3)
People at high risk to be infected with TB	
Anybody	137(21.5)
People having family members with TB	111(17.5)
People living with HIV	289(45.4)
Drug abusers	86(13.5)
People eating non nutritious food	55(8.6)
People who have been in prison	35(5.5)
Children and (Elderly or Women)	19(3.0)
Don't know	139(21.9)
Others	30(4.7)
Seriousness of TB	
Very serious	546(85.8)
Somewhat serious	52(8.2)
Not very serious	11(1.7)
Don't know	27(5.3)
Seriousness of TB for Ethiopia	
Very serious	502(78.9)
Somewhat serious	60(9.4)
Not very serious	14(2.2)
Don't know	60(9.4)

Bivariate and multivariate analysis for selected variables

In Bivariate analysis satisfactory knowledge was found to be positively & significantly associated with age group 33-37, educational status, employment status & income while there was no association with sex and previous TB history. However, in multivariate analysis satisfactory knowledge was only associated with educational status (Table 4).

Table 4: Selected factors association with satisfactory TB knowledge of PLHIV, A.A, 2011.

Variables	Satisfactory knowledge	Low knowledge	Crude OR (95%CI)	Adjusted OR[1] (95% CI)
Age of respondents				
<= 27	68(44.7)	84(55.3)	0.99(0.64-1.53)	0.89(0.56-1.43)
28-32	102(54.8)	84(45.2)	1.49(0.98-2.25)	1.33(0.85-2.08)
33-37	69(57.5)	51(42.5)	1.66(1.04-2.64) *	1.33(0.80-2.20)
>= 38	80(44.9)	98(55.1)	1.00[#]	1.00[#]
Sex of respondents				0.92(0.62-1.35)
Male	111(53.6)	96(46.4)	1.23(0.88-1.71)	
Female	208(48.5)	221(51.5)	1.00[2]	
Educational status				
Illiterates	64(31.8)	137(68.2)	1.00[#]	1.00[#]
Primary Education	101(47.4)	112(52.6)	1.93(1.29-2.88)*	1.74(1.15-2.62)*
Secondary & above	154(69.4)	68(30.6)	4.85(3.21-7.32)*	4.08(2.62-6.35)*
Employment status				
Employed	209(54.9)	172(45.1)	1.60(1.16-2.21)*	1.38(0.97-1.96)
Not Employed	110(43.1)	145(56.9)	1.00[#]	1.00[#]
Income				
<= 200 Birr/month	74(38.1)	120(61.9)	1.00[#]	1.00[#]
201-400 Birr/month	90(48.4)	96(51.6)	1.52(1.01-2.29)*	1.30(0.85-2.00)
401-600 Birr/month	70(57.4)	52(42.6)	2.18(1.38-3.46)*	1.51(0.91-2.51)
>= 601 Birr/month	85(63.4)	49(36.6)	2.81(1.78-4.44)*	1.58(0.94-2.67)
Previous TB history				
Yes	120(52.2	110(47.8	1.14(0.82-57)	
No	199(49.0	207(51.0	1.00[#]	

Note: [#] Reference categories(groups expected to have less satisfactory knowledge than the others), * shows statistically significant association, [1] Adjusted for Age group, Sex, Educational status, Current employment status and Income variables.

TB Prevention and Treatment Practice of PLHIV: As it is present in Table 5 below, practice of respondents on TB was assessed under three main sub divisions (Preventive practice, Intended Health seeking behavior & Treatment taking practice)

Table 5: TB related practice of PLHIV, Addis Ababa, 2010

Variables	Number (%)
Preventive Practice	
Usually covered mouth & nose during coughing & Sneezing (n=194, those who experienced pulmonary TB)	
Yes	150 (77.3)
No	44 (22.7)
How did you dispose your sputum (n=194, experienced PTB)	
Anywhere	6 (3.1)
Using small caps with lid	127 (65.5)
Using soft/tissue paper	45 (23.2)
Don't remember	6 (3.1)
Other	10 (5.2)
Opened door and windows at home/in the office (n=624)	
Yes	472 (75.6)
No	152 (24.4)
Opened windows of car during travel (n=624)	
Yes	224 (35.9)
No	400 (64.1)
Intended Health seeking practice	
What to do if one had symptom of TB (n=624)	
Go to health facility	604 (96.8)
Go to pharmacy	6 (1.0)
Go to holy water	10 (1.6)
Other self-treatment options (herbs, etc)	3 (0.5)
Don't know	1(0.2)
When to go to health facility if one had sign of TB (n=624)	
When treatment on my own doesn't work	32 (5.1)
When symptoms lasts for 2-3 weeks	206 (33.0)
As soon as one realize that the symptoms might be of TB	384 (61.5)
Wouldn't go to the health facility	2 (0.3)
Treatment taking practice	
Take preventive TB treatment regularly(n=231, get the treatment)	
Yes	211(91.3)
No	20 (8.7)
Take TB treatment regularly(n=228, who get medical treat. to TB)	
Yes	195 (85.5)
No	33 (14.5)

Ignorance/ not giving attention 83(54.6%) & afraid of cold air 49(32.2%) were the frequently mentioned reasons for not opening windows and doors at home. Majority (400(64.1%)) didn't often open windows of cars during travel. The reasons were didn't give attention 113(28.3%), afraid of cold air 197(49.3%), friends/other travellers didn't allow 169(42.3%). From 194 respondents who had pulmonary TB before/during the study, 44(22.7%) didn't cover mouth & nose during coughing & sneezing. Their reasons for not covering were; not giving attention/ignorance 28(63.6%), didn't know they have to 11(25%), & only think about their severe pain 25(56.8%). The most frequently mentioned reason for not completing TB treatment was drug side effect followed by starting holy water and other traditional medication, economic limitation, not getting the drug regularly and tired of taking many drugs.

Discussion:

This study demonstrated that there is knowledge gap in some specific TB knowledge measures. Of the study participants, 98.1% had heard about TB which is better than other community based studies in different parts of Ethiopia (6-9). About half (51.1%) of respondents were having satisfactory overall knowledge about TB. This can be called not good enough. It is almost same with the finding from community in Tigray before ten years (9) which may indicate that the health education for PLHIV so far is not yet efficient and effective enough. Only 24.2% were able to mention the right cause of TB. Whereas,

20.0% didn't know any cause & the rest (55.8%) related TB to other medically incorrect causes as the studies in Ethiopia so far also revealed (5, 6, 8). Cough that lasts more than two weeks was regarded as symptom of TB by 52.2% of the respondents which was somehow less than the findings from other studies (8, 9). Coughing with sputum was better mentioned (65.3%). This might have some impact on treatment seeking for non productive cough which will affect the early detection and treatment strategy of the control program.

They had somehow contradictory knowledge like; knowing TB is contagious and transmitted by aerosol while on the other side they believe that the cause is physical like cold air or other non contagious causes. This might be as a result that the information disseminated about TB is not clear enough to show the different aspects of TB. This absence of logical cohesion between ideas of core biomedical knowledge about TB may cause confusion that will result in disabling its impact on behavioral change of the community. The finding also showed that the respondents' knowledge on prevention methods was very limited. It was indicated that not being aware of their higher risk of contracting TB caused PLHIV to delay in seeking care and failure to follow their medication care (11). Less than half (45.4%) of the respondents knew that PLHIV are at higher risk of getting TB. This can have its own impact on their preventive activities & control process.

Drug resistant TB is a very serious threat to PLHIV (12). Only 16.8% of the respondents in this study new drug resistant TB development may be the consequence of stopping/not finishing TB treatment properly. Of the participants, 72.5% knew that TB diagnosis and treatment are free of charge which is better than the finding of the study on Eastern Ethiopia prisoners, where half the participants didn't know the free treatment policy (5). However, still more than a quarter didn't know it which will have its own impact on the control program.

In the present study educational status was the only significantly associated factors with TB knowledge. Better educated individuals were more likely to have satisfactory knowledge which is consistent with other findings elsewhere (7, 8). Previous TB history was found to have no significant association with knowledge which is a different finding from the Eastern Ethiopia study on prisoners (5). This may indicate that the involvement of a standardized patient education during the TB curative service is not good enough.

From those who have had pulmonary TB, 23.2% used soft/tissue paper to dispose their sputum. Though it is better than spitting sputum everywhere, it will not have contribution in controlling TB if the soft is thrown anywhere which is common in our society. Considering the way to dispose soft after use in health education about TB is important and improving the environmental health service, i.e. provision of dust bins in different areas, and working towards using the dust bins properly could be also a solution.

It is obvious that there is high suffocation on public transportations in Addis Ababa. Despite the high risk, it was found that awareness and practice of the PLHIV towards the importance of opening windows is low. This will catalyze the transmission of the disease and affect the prevention program.
The finding on drug non completion can be a good supplement to the retrospective adherence study done recently in Addis Ababa on PLHIV, which showed that it was high (13). This indicates the need for further effort in the area.

***Strengths**:* The best quantitative study design, cross sectional for KAP study, is used. High response rate was the other one, which could be as a result of making the data collectors the staffs who work in the ART service room. The clients were asked to participate by their service givers. The other strength was sampling method and procedure used. It was targeted to decrease selection bias.

***Limitations**:* Since it was a KAP study, there is no gold standard to measure TB knowledge which made the comparison of the finding with other studies somewhat difficult, therefore this should be considered during the comparisons. Absence of baseline data on the specific target population (PLHIV) for comparison was also a problem. The study was not supported by qualitative data because of resource limitation.

Conclusion

Half of the study population (49.8%; 95%CI: 46.0%-53.7%) were found to have low overall knowledge on TB. Their knowledge varied substantially with respect to specific TB awareness measures. Wider gaps were identified on cause & curability of TB, advantage of opening windows of cars & ventilating suffocated areas, consequence of stopping/not finishing TB treatments, high risk of PLHIV for TB, and free TB diagnosis and treatment policy in Ethiopia. Therefore, the health education/promotion that is prepared by different bodies should be clear & complete enough to address these gaps. It is also

better if it is specific and target oriented (targeted for PLHIV). Using the preferred sources of information (health workers, TV and radio) for future health education & awareness creation activities could be a wise step to address the target groups.

Educational level was found to have a significant association with TB knowledge. More effort by the ACSM and TB prevention and control programmers is expected to address illiterates who were more likely to have low knowledge. On the other hand, previous TB history was found to have no significant association. Organizing a standardized patient education for TB patients during delivering care service could be also a reasonable approach towards effective TB control activities.

Although the intended health seeking practice of the PLHIV was encouraging, their practice on prevention of TB and treatment taking was not good enough. It was even very poor in some practices like opening windows of cars. Due consideration should be given for the behavior change that should be achieved as a result of awareness creation by the ACSM & TB prevention and control programmers.

Finally, a further qualitative study is worth to support and strengthen the findings.

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