Public Knowledge, Attitude, And Stigma Towards Tuberculosis In Surabaya, Indonesia: Determining Associated Factors For Poor Attitude

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Abstract.

Tuberculosis (TB) is one of infectious disease that still remains a public health concern. Various factors affecting the TB treatment success rate including public knowledge, attitude, and stigma. Public knowledge and attitude directly associated with individual awareness that impacts TB transmission and early screenings for TB. This study aimed to assess public knowledge, attitude and stigma regarding TB in Surabaya, Indonesia and specifically analyzed the associated factors of having poor TB attitude. An observational, cross-sectional study was conducted using self-administered online questionnaire. Individuals age 18 years old or above were recruited at six different pharmacies in Surabaya during their visit and those who decided to withdraw after fulfilling the questionnaire were excluded. A total of 436 participants were recruited for this study. Of them, females were predominant (71.3%) and the majority of them were in the age groups of 18 to 30 years (69.3%). They were mostly had graduated from secondary school (60.3%). Concerning income, most of participants earned less than 1 million IDR. Regarding their levels of knowledge, attitude and stigma, the majority of them had good knowledge (50.7%), moderate attitude (47.5%), and positive stigma (93.1%). The significant associated factor of having poor attitude was knowledge which participants with good knowledge were less likely to have poor attitude (b= -1.103; OR = 0.332; p-value 0.000). Therefore, increasing level of public knowledge related to TB will significantly increase their attitude towards TB.

Keywords: Tuberculosis, Predictors and Attitude.

I.   INTRODUCTION

Tuberculosis (TB) is one of infectious disease caused by Mycobacterium tuberculosis that still remains a public health concern. Recent TB global report by World Health Organization stated that in 2021 about 10.6 million people developed TB and the mortality rate reached 1.6 million cases made it as the top thirteen of mortality cause globally [1]. Indonesia is one of the 30 high TB burden that reported to have major contribution on tne increase of TB cases in 2020 to 2021 with the total 9.2% of the global case found in Indonesia [1]. In 2014-2015, WHO commited to end TB through WHO's End TB Strategy. The strategy are to reduce the absolute number of TB deaths up to 75% in 2025 and 95% in 2035 and to lower the TB incidence rate in 50% in 2025 and 90% in 2035 [2].

Indonesian Ministry of Health also commited to support The End TB Strategy through National TB Elimination roadmap 2020-2030. The roadmap targeted the lower TB incident up to near 65 cases per 10.000 inhabitants in 2030 [3]. However, the treatment success rate observed in 2022 still at 82% (beyond the global standard <90%) [4].Various factors affecting the TB treatment success rate including public knowledge, attitude, and stigma. Public knowledge and attitude directly associated with individual awareness that impacts TB transmission and early screenings for TB [5]. Additionally, public stigma related TB lead patients to conceal their diagnosis from either or be non-adherence on their treatment which make tracing and treatment process more difficult [6]. Therefore, assessing public knowledge, attitude and stigma regarding TB will help us to formulate public awareness improvement strategy that directly affecting the TB treatment success rate.

II.   METHODS

This was an observational, cross-sectional study targeted population in Surabaya city, Indonesia from February to April 2023 using self-administered online questionnaire. The protocol of the study was approved by University of Surabaya Ethics Committee with the certificate number 85/KE/III/2023. Individuals age 18 years old or above were recruited at six different pharmacies in Surabaya during their

visit. Participants were selected using purposive sampling technique. Consent to participate was taken from participants electronically. Participants who decided to withdraw after fulfilling the questionnaire were excluded.

Data collection instruments

We used developed questionnaire measuring participants' knowledge and attitude while for observing stigma, we adopted and translated questionnaire from TB Stigma Mesurement Guidance Capter 4 into Bahasa Indonesia [7]. Before using the questionnaire, we performed validity and reliability test to 30 pioner participants. The validity test was carried out using Point Biserial Correlation for the knowledge and stigma part while for attitude part we used Pearson Correlation test. For the reliability evaluation, Kuder-Richardson 20 (KR-20) was used for the knowledge and stigma part, while the attitude section was evaluated using Cronbach's α. The evaluation results all section of the questionnaire showed valid instruments (r count of all statements observing knowledge and stigma > r table 0.296 while sig.(2-tailed) for all statements observing attitude were <0.05, respectively). Regarding the reliability test, all the questionnaire parts also revealed reliable results (Reliability Coeficient r >0.6 for all statements in knowledge and stigma sections and Cronbach's α 0.606 in attitude section respectively).

All the questionnaire was handed out to the participants via Google form. However, before fulfilling the questionnaire, participants were asked to complete sociodemographic data such as gender, age, monthly income, educational level and their occupation at the first section of the form. Afterwards, the section continued to the knowledge, attitude, and stigma assessment part. The knowledge assessment part omprised of 14-items using options "Yes", "No", and "Do not know" assessing knowledge about the cause of TB, the organs that can be affected by TB, the symptomps and spread of TB, the prevention and the regulation of TB treatment in Indonesia. Furthermore, the attitude section consisted of 4-items statements using a five-point Likert scale "strongly disagree", "disagree", "neutral", "agree", and "strongly agree". Lastly, the stigma parts comprised 8-items measuring participants' stigma about TB patients related to their hygine and how they behave and how the should be managed in social environment. The questions used options "agree" and "disagree".

Data analysis

The sociodemographics and participants' response to questionnaire were presented descriptively as frequencies and related percentages. Participant's overall knowledge and attitude were classified into good, moderate, and poor based on the total percentage score as follows: good for scores 80% and above, moderate for scores 60-79%, and poor for scores below 60% according to Bloom's cutoff point while for stigma we categorized the scores into two classifications namely positive (scores 50% or above) and negative (scores <50%). To score the 14 statements assessing knowledge, 1 point was given to correct response and 0 point for incorrect or "Do not know" response. The correct responses were classified as "participants who know" while the incorrect or "Do not know" response classified as "participants who don't know". The total score for knowledge ranged from 0 to 14. Regarding attitude categorization, responses were scored 1 for strongly disagree, 2 for disagree, 3 for undecided, 4 for agree, and 5 for strongly agree. The total scores ranged from 4 to 20. Concerning stigma, responses were scored 0 for agree and 1 for disagree.Statistical analysis employed SPSS version 22 (International Business Machine) was used in this study. Multinomial logistic regression was utilized to explore variables that predict poor TB attitude. Age, gender, educational background, income, knowledge, and stigma were the predictors factors analyzed. Statistically significant predictors identified with a P-value less than 0.05.

III. RESULT AND DISCUSSION

A total of 436 participants recruited for this study. Their sociodemographics characteristics illustrated in Table 1. Of them, females were predominant (71.3%). The majority of participants were in the age groups of 18 to 30 years (69.3%). In addition, only 5.7% of the participants had received primary education (at level of elementary school), 60.3% had graduated from secondary school, and 33.9% were university graduates. Concerning income, most of participants earned less than 1 million IDR (exchange rate 1 USD = 14.661 IDR) at 34.6% (Table 1).

Table 1. Sociodemographic characteristics of participants

Characteristics	Classifications	Number (n = 436)	Percentage (%)
Gender	Female	311	71.3
	Male	125	28.7
Age (years)	18-30	302	69.3
	31-40	56	12.8
	$\geq$ 46	78	17.9
Educational Background	Primary school	25	5.7
	Secondary school	263	60.3
	Higher education	148	33.9
Income[a]	<1.000.000	151	34.6
	1.000-000-3.000.000	146	33.5
	>3.000.000	139	31.9

Regarding participants levels of knowledge, the results showed that about half of them had good knowledge towards TB at 50.7%. However, those who had moderate levels of knowledge observed at 44.3%. The poor knowledge participants only assessed at 5.0% (Figure 1). In comparison, a multi cross-sectional survey done in 34 province in Indonesia in 2022 also reported a good knowledge in 56.4% participants (Kaaffah et al., 2023). This consistent results indicated that adequate knowledge improvement about TB in the community is required as a nationwide response to end TB.
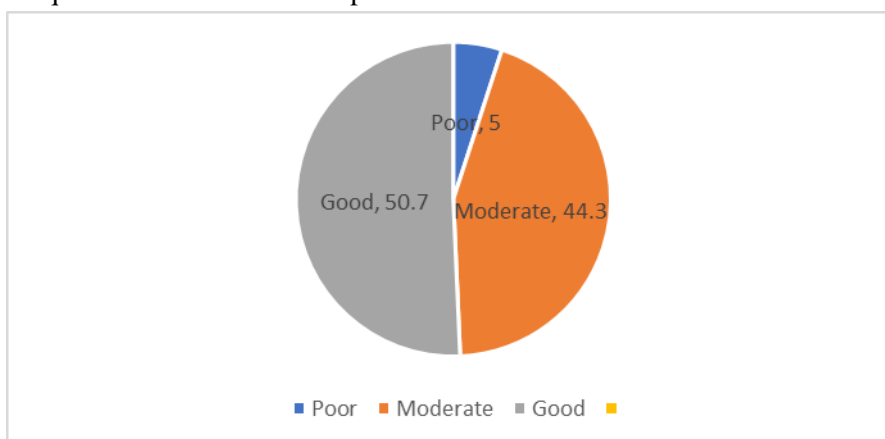
Fig 1. Participants classification of knowledge regarding TB

Looking in more detail from Table 2, in cause of TB parameters, there were 26.6% and 67.9% of respondents thought that TB is hereditary and related to social behavior, respectively. The results showed lower figures compared to those which reported by a study in India that 51.3% of their participants though whether TB is a hereditary disease [8]. Oppositely, studies in Gujarat and Aligarh had reported that almost 96% of their patients were aware that TB is not a hereditary disease [9, 10]. The difference of results observed could be caused by the different literacy status and resource access in the areas. However, there were no previous study assessing the thougt that TB is related to social behavior. The public opinion whether TB associated with social behaviour could drive negative stigma that could directly delay a person's decision to initiate TB treatment. Hence, educate public regarding the cause of TB is essentials.In terms of organs affected by TB, 44.6% of participants did not know that TB can affects other organs besides lungs. This condition make it possible in slower detection of extrapulmonary TB which contributes to the high burden and transmission of extrapulmonary TB.

A study in Ethiopia reported that having never heard of extra pulmonary TB disease (AOR = 5.52; 95% CI = 1.73, 17.56) was associated with a total diagnostic delay of beyond 5 weeks [11]. The other parameters which most of respondents did not know was that the TB treatment in Indonesia is free of charge (about 63.9% respondents had misconception in this fact). According to Presidential Regulation No. 67 of 2021 on TB elimination, individual health services for TB patients are covered by Indonesian national health insurance (JKN) while public health services including specimen transportation systems, antituberculosis drugs, and reagents for diagnostic equipment are budgeted through the national TB program [12]. Lack of

public knowledge about the coverage of TB treatment could lead to the delayed in starting treatments because patients or families would think that starting and completing TB treatments will cost a lot of money. Therefore, public campaign purposed to inform TB treatment coverage should be also prioritized.

Table 2. Participants knowledge towards TB

Domains	Questions	n (%) of Participants who know	n (%) of Participants who do not know
Cause of TB	TB is caused by bacterial infection	381 (87.4)	55 (12.6)
	TB is hereditary	320 (73.4)	116 (26.6)
	TB is related to social behaviour	140 (32.1)	296 (67.9)
Organs affected by TB	TB usually attacks lungs	401 (92.0)	35 (18.0)
	TB can affects other organs besides lungs	241 (55.3)	195 (44.6)
TB symptomps	Coughing, coughing up blood, chest pain are symptoms of pulmonary TB	400 (91.7)	36 (8.3)
TB transmission	TB can be transmitted through air contact when an infected person coughs or sneezes	381 (87.4)	55 (13.6)
	Everyone can get TB	361 (82.8)	75 (17.2)
TB prevention	TB can be prevented	400 (91.7)	36 (8.30)
	Covering mouth and nose when sneezing and coughing can reduce TB transmission	405 (92.9)	31 (7.1)
TB treatment	TB can be cured	386 (88.5)	50 (11.5)
	TB patients must be treated routinely at the health center, hospital or selected health facility	418 (95.9)	18 (4.1)
	TB treatment uses specific antibiotics that cannot be purchased without a prescription	371 (85.1)	65 (14.9)
	TB medication are free of charge	201 (46.1)	235 (63.9)

Figure 2 depicts the levels of participants' attitude towards TB. Almost half (47.5%) of the total respondents had moderate attitudes while good attitude participants observed by 2.7%. On the other hand, poor attitude participants only constituted 16.7% of the total respondents. Upon investigating the attitude in more detail (Tabel 3), most of respondents considered TB as a serious disease (77.5%). In addition, 54.8% also believed that TB spread fastly in Indonesia. The results were above two folds higher that those reported by Angelo et al 2020 that only 30% of their respondents agreed whether TB is a serious disease but slightly lower than the study by Kigozi et al 2017 at 89.7% [5,13].

However, the figures of participants in the study who agreed and strongly agreed that they could get TB were slightly higher than our findings at 52% versus 40.8%, respectively [5]. The lower misconception of the dangerous of TB in our study might revealed the high awareness in prevention practices and early getting TB treatment. However, when asked about the TB success treatment rate in Indonesia, the majority of them (40.1%) have no agreement if the rate is still low which indicated that the campaign about TB situation in Indonesia is needed in order to increase their awareness that Indonesia still have big project in eliminating TB.
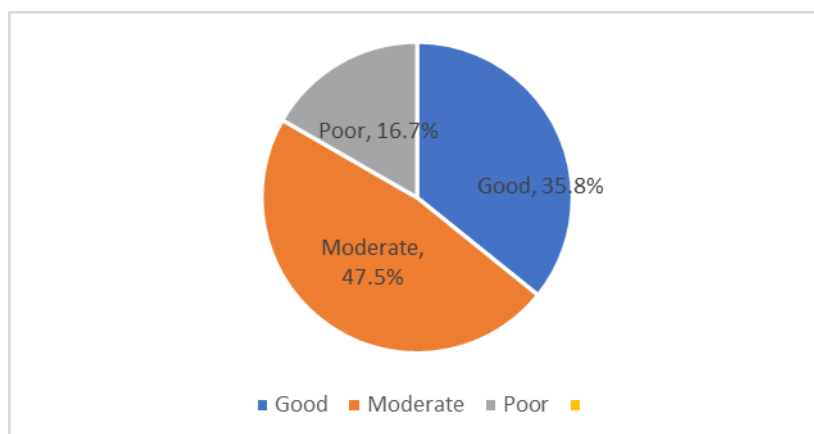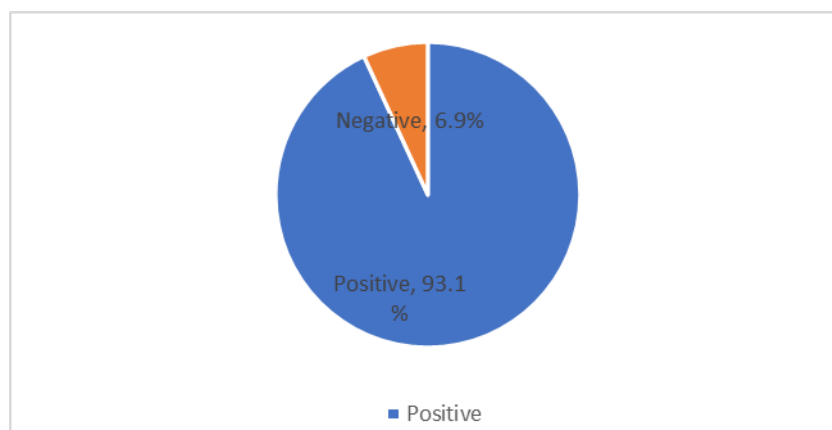

Fig 4. Participants classification of attitude regarding TB

Table 3. Participants attitudes towards TB

Attitude towards TB	Likert scale	n	%
I think that TB is a serious disease.	Strongly Agree	239	54.8
	Agree	99	22.7
	Neutral	59	13.5
	Disagree	11	2.5
	Strongly Disagree	28	6.4
I think TB fastly spread in Indonesia.	Strongly Agree	134	30.7
	Agree	105	24.1
	Neutral	139	31.9
	Disagree	37	8.5
	Strongly Disagree	21	4.8
I think that the success rate of TB treatment in Indonesia still low.	Strongly Agree	76	17.4
	Agree	95	21.8
	Neutral	175	40.1
	Disagree	36	8.3
	Strongly Disagree	54	12.4
I think I probably get TB.	Strongly Agree	89	20.4
	Agree	89	20.4
	Neutral	125	28.7
	Disagree	65	14.9
	Strongly Disagree	68	15.6

Looking more detail from Figure 3, overall, the majority of participants had positive stigma towards TB (93.1%). This findings was contrary to the results sowed by a study performed in China which said that 19.47% of participants had high stigma and 30.95% had moderate stigma on TB and the report by population-based study in India that 73% of the general population had a stigmatizing attitude toward patients with TB [13, 14]. This difference reflected good potency in our participants in accepting and supporting TB patients that affect in the success of treatment.

However, there were several statements that reflecting high stigmatization toward people with TB such as the thought that people with TB must be restricted on their freedom, should be isolated, and should not be allowed to work which about 28.2%, 36.5%, and 28.4% of respondents agreed with the ideas respectively (Table 3). Physical isolation is appropriate and necessary for TB patients to control the infection until the an adequate treatment regimen have been suppressed the mycobacteria, typically after the first two weeks of treatment for drug-susceptible TB, and after one to three months of treatment for DR-TB [15, 16]. However, social isolation should be avoided because it can increase morbidity and reduce treatment adherence in people with TB [17]. Additionally, restriction on their freedom socially including at office or workplace will declines the amount of social support received and can be detrimental to the health of them. Therefore, our findings suggested that increasing the knowledge in physical and social isolation is needed to minimalize stigmatization.

Fig 3. Participants classification of stigma towards TB

Table 4. Participants stigma towards TB

Stigma towards TB	Response	n	%
People who have TB are dirty	Agree	29	6.7
	Disagree	407	93.3
People who have TB are cursed	Agree	3	0.7
	Disagree	433	99.3
People who have TB should be ashamed	Agree	3	0.7
	Disagree	433	99.3
People with TB must expect some restrictions on their freedom	Agree	123	28.2
	Disagree	313	71.8
A person with TB must have done something wrong and deserves to be punished	Agree	6	1.4
	Disagree	430	98.6
People who have TB should be isolated	Agree	159	36.5
	Disagree	277	63.5
I do not want to be friends with someone who has TB	Agree	39	8.9
	Disagree	397	91.1
People who have TB should not be allowed to work	Agree	124	28.4
	Disagree	312	71.6

The analysis of predictors related to poor attitude (Table 4) showed that only participants knowledge had significant association (p-value <0.05). As we can see from the table, the B value of good knowledge was negative that reflected participants with good knowledge were less likely to have poor attitude. The odds ratio of 0.332 indicated that for every increase of knowledge classification, the odds of participants to have poor attitude would decrease by a factor of 0.332. Our results was inline with the research performed in Equatorial Guinea which stated that having a high TB knowledge score was associated with having a good attitude towards the disease (PR = 1.38, 95% CI: 1.15–1.67) [18]. Additionally, it also confirmed the studies conducted in Gambia and South Western Ethiopia that having better attitudes towards TB is also associated with having good knowledge of the disease [19, 20]. Therefore, people with good knowledge especially in symptoms and the preventive of TB were more likely to have better attitudes and healthcare seeking behavior, which reduces the delay in TB diagnosis and also improves and supports patients adherence to treatment [18].

Table 5. Associated factors toward poor TB attitude by multinomial logistic regression

Variables	Classifications	B	Odds ratio	95% CI	p-value
Age (year)	-	0.059	1.060	0.734-1.532	0.755
Gender	Female	0.100	1.106	0.587-2.083	0.756
Educational ackground	Higher education	-0.074	0.929	0.544-1.585	0.787
Income[a]	>3,000,000*	-0.145	0.450	0.595-1.259	0.865
Knowledge	**Good**	**-1.103**	**0.332**	**0.202-0.545**	**0.000**
Stigma	Positive	0.583	1.792	0.541-5.931	0.339

*Income in Indonesian Rupiah (IDR), exchange rate 1 USD = 14.661 IDR

IV.   CONCLUSION

Most of participants had good knowledge, moderate attitude, and positive stigma. Moreover, poor attitude appears to be more prevalent among those who have not good knowledge. More campaigns both in real life and through online platforms should be considered to raise knowledge regarding TB will directly related to the increase of public attitude towards TB.

V.   ACKNOWLEDGMENTS

REFERENCES

[1]   World Health Organization. *Global tuberculosis report 2022*. Geneva: World Health Organization, https://www.who.int/publications/i/item/9789240061729 (2022, accessed 4 August 2023).

[2]   World Health Organization. *Global tuberculosis report 2021*. Geneva: World Health Organization, https://apps.who.int/iris/handle/10665/346387 (2021, accessed 4 March 2022).

[3]   Indonesian Ministry of Health. *Strategi Nasional Penanggulangan Tuberkulosis di Indonesia 2020-2024*. Jakarta: Kementerian Kesehatan RI, 2020.

[4]   Directorate General of Prevention and Disease Control. *Tuberculosis Control in Indonesia 2022*. Jakarta: Ministry of Health Republic Indonesia, https://tbindonesia.or.id/wp-content/uploads/2023/02/Factsheet-Country-Profile-Indonesia-2022.pdf (2022).

[5]   Angelo AT, Geltore TE, Asega T. Knowledge, Attitude, and Practices Towards Tuberculosis Among Clients Visiting Tepi General Hospital Outpatient Departments, 2019. *IDR* 2020; Volume 13: 4559–4568.

[6]   Cremers AL, De Laat MM, Kapata N, et al. Assessing the Consequences of Stigma for Tuberculosis Patients in Urban Zambia. *PLoS ONE* 2015; 10: e0119861.

[7]   Meershoek A, Zwerling A, Daftary A, et al. *TB Stigma Measurement Guidance Chapter 4*. Washington: Challenge TB, 2018.

[8]   Nautiyal R, Mittal S, Awasthi S, et al. Knowledge about tuberculosis among pulmonary tuberculosis patients: A cross-sectional study from Uttarakhand. *J Family Med Prim Care 2019*; 8: 1735.

[9]   Khalil S, Ahmad E, Khan Z, et al. A study of knowledge and awareness regarding pulmonary tuberculosis in patients under treatment for tuberculosis in a rural area of Aligarh-UP. 2011; 23: 93–95.

[10]   Vidhani M, Vadgama P. Awareness regarding pulmonary tuberculosis – A study among patient taking treatment of tuberculosis in rural Surat, Gujarat. *National Journal of Medical Research 2012*; 2: 452–455.

[11]   Bilchut AH, Mekonnen AG, Assen TA. Knowledge of symptoms and delays in diagnosis of extrapulmonary tuberculosis patients in North Shewa zone, Ethiopia. *PLoS ONE* 2022; 17: e0270002.

[12]   World Health Organization, Indonesian Ministry of Health. *INDONESIA TB JOINT EXTERNAL MONITORING MISSION (JEMM) REPORT,* https://www.who.int/indonesia/news/publications/other-documents/tb-joint-external-monitoring-mission-(jemm)-report--2022 (2022, accessed 24 August 2023).

[13]   Kigozi NG, Heunis JC, Engelbrecht MC, et al. Tuberculosis knowledge, attitudes and practices of patients at primary health care facilities in a South African metropolitan: research towards improved health education. *BMC Public Health* 2017; 17: 795.

[14]   Sagili KD, Satyanarayana S, Chadha SS. Is Knowledge Regarding Tuberculosis Associated with Stigmatising and Discriminating Attitudes of General Population towards Tuberculosis Patients? Findings from a Community Based Survey in 30 Districts of India. *PLoS ONE* 2016; 11: e0147274.

[15]   Dharmadhikari AS, Mphahlele M, Venter K, et al. Rapid impact of effective treatment on transmission of multidrug-resistant tuberculosis. *int j tuberc lung dis 2014*; 18: 1019–1025.

[16]   Ritchie SR, Harrison AC, Vaughan RH, et al. New recommendations for duration of respiratory isolation based on time to detect Mycobacterium tuberculosis in liquid culture. *European Respiratory Journal 2007*; 30:501–507.

[17]   Redwood L, Fox GJ, Nguyen TA, et al. Good citizens, perfect patients, and family reputation: Stigma and prolonged isolation in people with drug-resistant tuberculosis in Vietnam. *PLOS Glob Public Health* 2022; 2: e0000681.

[18]   Vericat-Ferrer M, Ayala A, Ncogo P, et al. Knowledge, Attitudes, and Stigma: The Perceptions of Tuberculosis in Equatorial Guinea. *IJERPH 2022*; 19: 8227.

[19]   Bashorun AO, Linda C, Omoleke S, et al. Knowledge, attitude and practice towards tuberculosis in Gambia: a nation-wide cross-sectional survey. *BMC Public Health* 2020; 20: 1566.

[20]   Bati J, Legesse M, Medhin G. Community's knowledge, attitudes and practices about tuberculosis in Itang Special District, Gambella Region, South Western Ethiopia. *BMC Public Health* 2013; 13: 734.