International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

# Evaluating the Understanding, Beliefs, and Recognition of Tuberculosis Screening in the Workplace Among Pharmacists and Pharmaceutical Support Personnel at a Teaching Hospital, Ghana

**Dr. Dr. Ibrahim Ibn Saana[1], Dr. Daniel N.A. Ankrah[2], Dr. Charles K. Ofei-Palm[3], Dr. Daniel Amaning Danquah[4], Ms. Olga Awuni[5], Dr. Daniel Abugbila[6]**

[1]Public Health Consultant/Researcher, Pharmacy, Korle Bu Teaching Hospital, Accra
[2]Consultant Pharmacist/Health Researcher, Pharmacy, Korle Bu Teaching Hospital
[3]Consultant Pharmacis/Epidemiologist, Pharmacy, Korle Bu Teaching Hospital
[4]Pharmacy Regulator, Pharmacy, Pharmacy Council,Ghana
[5]Specialist Clinical Pharmacist, Pharmacy, Greater Accra Regional Hospital, Accra
[6]Public Health Pharmacist, Pharmacy, Dan New Life Hospital, Uer

**Abstract**

**Background:** This study investigates the understanding, beliefs, and recognition of tuberculosis (TB) screening among pharmacists and pharmaceutical support personnel at a Teaching Hospital. Understanding the perspectives of healthcare workers regarding TB screening in the workplace is crucial for optimizing screening programs and improving TB control efforts.

**Methods:** A quantitative cross-sectional design was used. A total of 205 respondents. Semi-structured questionnaires, adapted and validated from previous research, were utilized to gather data electronically via a RedCap survey link. Data collection occurred between March 20th, 2023, and the end of May 20th, 2023, at various pharmacy units of Korle Bu Teaching Hospital. The collected data were organized using Excel software and analyzed using Statistical Package for Social Sciences (SPSS), version 26.0. Descriptive statistics were employed to analyze the results.

**Findings**: A total of 205 participants were involved in the study, with a non-response rate of 1.9%. Among the respondents, pharmacists were the majority, at 72.9%. The mean (SD) age of the participants was 35 (±8.7) years. Male respondents comprised 54.7% of the sample, while 41.4% held post-graduate qualifications. Regarding understanding levels, 16.7% of the participants demonstrated excellent understanding, 57.65% had average, and 26.6% exhibited poor understanding regarding TB screening. Statistical analysis revealed a significant difference in understanding between pharmacists and support staff (t (201) =, p=0.00). However, there was no statistically significant difference observed in the recognition levels between them.

**Conclusion:** The study revealed that 16.7% of the staff demonstrated an excellent understanding, while 57.65% exhibited an average understanding of TB screening. There was a high level of recognition among the staff groups, totaling 61.57%. The analysis also indicated a significant disparity in understanding between pharmacists and support staff (t (201), p=0.00). A statistically significant difference was not found in the recognition levels of TB screening between these two groups.

**Keywords:** Tuberculosis screening, understanding, recognition, Beliefs, Health Worker

**Introduction:**

Tuberculosis (TB) remains a significant global public health concern, particularly in low- and middle-income countries like Ghana. Despite concerted efforts to control and eradicate the disease, TB continues to pose substantial challenges, including high rates of morbidity and mortality (World Health Organization, [1]. Screening for TB in high-risk populations, including healthcare workers, is crucial for early detection, treatment initiation, and prevention of transmission (Lönnroth et al., [2]. Within the healthcare system, pharmacists and pharmaceutical support personnel play a pivotal role in TB management due to their frequent interactions with patients and access to healthcare facilities [3]. Ghana, like many other countries, faces unique challenges in TB control, including limited resources, infrastructure, and awareness among healthcare professionals. Understanding the perspectives, beliefs, and practices of pharmacists and pharmaceutical support personnel regarding TB screening in the workplace is essential for designing targeted interventions to improve screening rates and overall TB control efforts. Studies show that belief systems can seriously affect treatment and healthcare in general. Understanding patient belief systems, including healthcare workers, has the potential to maximize care, especially in the Ghanaian context. [4]This study aims to evaluate the understanding, beliefs, and recognition of TB screening in the workplace among pharmacists and pharmaceutical support personnel at a teaching hospital in Ghana. The research sought to explore the knowledge, attitudes, and practices related to TB screening among pharmacy personnel in order to identify the barriers and facilitators to effective TB control within the healthcare system. It also aimed to assess the level of awareness and utilization of TB screening services among pharmacists and pharmaceutical support staff to inform strategies for strengthening TB prevention and control initiatives in healthcare settings. Through a comprehensive review of the literature, the study discussed the global burden of TB, emphasized the importance of TB screening in healthcare environments, and examined the role of pharmacists and their support personnel in TB control. Furthermore, it highlighted the potential contributions of the study to TB control efforts in Ghana and beyond.

**Study area:** The Korle Bu Teaching Hospital, established on October 9, 1923, stands as Ghana's foremost tertiary healthcare institution. Initially founded by Sir Frederick Gordon Guggisberg, the then Governor of the Gold Coast, it began as a General Hospital dedicated to meeting the healthcare needs of the populace. "Korle Bu," derived from the local Ga language, signifies "the valley of the Korle Lagoon," reflecting its geographical context. Over time, the hospital experienced a surge in patient attendance due to the demonstrated effectiveness of hospital-based treatments, leading to significant congestion. In response, a committee was formed in 1953 to evaluate and recommend expansions, resulting in the addition of structures such as the Child Health, Maternity, Medical, and Surgical Blocks. Today, with a total bed capacity of approximately 3,000 and a healthcare workforce close to 10,000, Korle Bu Teaching

Hospital stands as the nation's premier quaternary teaching hospital, playing a pivotal role in Ghana's healthcare landscape.

**Study population:** pharmacists and pharmaceutical support personnel

Inclusion criteria: All pharmacists and pharmaceutical support staff members who have accrued more than three months of professional experience.

All pharmacists and pharmaceutical support personnel employed at Korle Bu Teaching Hospital

All Resident Pharmacists are affiliated with the Korle Bu Teaching Hospital.

**Exclusion Criteria:** Pharmacists and pharmaceutical and pharmaceutical support personnel who have less than three months of experience within the Korle Bu Teaching Hospital.

Pharmacists and pharmaceutical support personnel are not employed within the Korle Bu Teaching Hospital.

Resident Pharmacists are not affiliated with Korle Bu Teaching Hospital.

**Data collection:** Data collection involved face-to-face interviews using a structured questionnaire to conduct it. The questionnaires from already validated sources were designed and tested before the survey began. The study was carried out with the aid of the designed questionnaires/instruments adopted from sources of the validated instrument used to collect data from March 20th, 2023, and the end of May 20th, 2023, at various pharmacy units of Korle Bu Teaching Hospital

**Statistical analysis:** The collected data were organized using Excel software and analyzed using Statistical Package for Social Sciences (SPSS), version 26.0. Descriptive statistics were employed to analyze the results

**Ethical consideration:** Permission was sought from the hospital authorities.

**Results:**

**Sociodemographic**

A total of 205 participants were involved in the study, with a non-response rate of 1.9%. Among the respondents, pharmacists were the majority, at 72.9%. The mean (SD) age of the participants was 35 (±8.7) years. Male respondents comprised 54.7% of the sample, while 41.4% held post-graduate qualifications. Regarding understanding levels, 16.7% of the participants demonstrated excellent understanding, 57.65% had average, and 26.6% exhibited poor understanding regarding TB screening. Statistical analysis revealed a significant difference in understanding between pharmacists and support staff (t (201) =, p=0.00). However, there was no statistically significant difference observed in the recognition levels between them

**Figure 1. Gender Distribution of sexes**

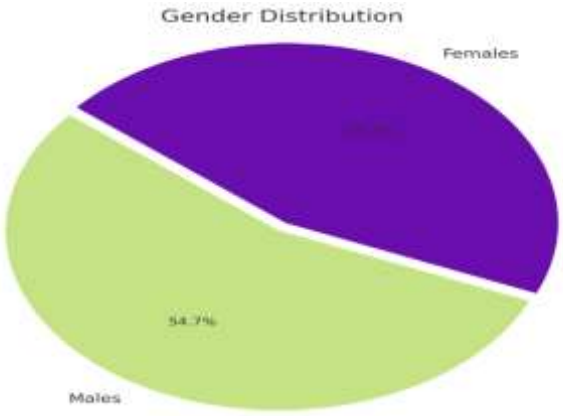


**Table 1: Demographic Characteristics of Respondents**

| Variable | Categories | Frequency | Percent (%) | Cum. Percent (%) |
|---|---|---|---|---|
| Age | | 35 (±8.7) | | |
| Age groups | 20-30 yrs. | 67 | 33.0 | 33.0 |
| | 31-40 yrs. | 68 | 33.5 | 66.5 |
| | 41-50 yrs. | 56 | 27.6 | 94.1 |
| | 51+ yrs. | 12 | 5.9 | 100.0 |
| | Total | 203 | 100 | |
| Gender | Male | 111 | 54.7 | 54.7 |
| | Female | 92 | 45.3 | 100.0 |
| | Total | 203 | 100.0 | |
| Staff Category | Pharmacist | 148 | 72.9 | 72.9 |
| | Phar'tical Support personnel | 55 | 27.1 | 100.0 |
| | Total | 203 | 100.0 | |
| Education Level? | Undergraduate | 36 | 17.7 | 17.7 |
| | Graduate | 83 | 40.9 | 58.6 |
| | Post Graduate | 84 | 41.4 | 100.0 |
| | Total | 203 | 100.0 | |
| What department/ unit? | 24 Hours Pharmacy | 11 | 5.4 | 5.4 |
| | Cardio Pharmacy | 11 | 5.4 | 10.8 |
| | Surgical Pharmacy | 22 | 10.8 | 21.7 |
| | Chest Pharmacy | 12 | 5.9 | 27.6 |
| | Child Health Pharmacy | 8 | 3.9 | 31.5 |
| | Maternity Pharmacy | 27 | 13.3 | 44.8 |
| | Polyclinic Pharmacy | 6 | 3.0 | 47.8 |
| | Medical Pharmacy | 40 | 19.7 | 67.5 |
| | Others | 66 | 32.5 | 100.0 |
| | Total | 203 | 100.0 | |

Table 2 illustrates the understanding of TB screening among pharmacists and pharmaceutical support personnel. All respondents were familiar with Tuberculosis, with nearly all of them aware of TB screening, except for a small percentage (1.5%) who were not. The majority (68.9%) correctly identified the recommended tests for TB screening. However, a significant proportion lacked knowledge about blood tests (37.9%) and skin tests (35.0%) for Tuberculosis screening, and just over half (50.2%) understood the implications of positive TB screening results.

Workplaces emerged as the primary source of TB screening information, accounting for 37% of responses. Other sources included Articles/Books/Lectures, comprising 23.0%, and Television, contributing 18%, as depicted in Figure 1. When asked who required TB screening, 23.1% of respondents cited people living with HIV infection, followed by 22.7% mentioning individuals with weakened immune systems due to other illnesses, and 18.9% indicating those who had not received proper treatment for TB in the past, as shown in Figure 2.

**Table 2: understanding of Workplace TB screening of Respondents**

| Variable | Categories | Frequency | Percent (%) |
|---|---|---|---|
| Have you heard of Tuberculosis? | Yes | 203 | 100.0 |
| Have you heard of Tuberculosis Screening? | No | 3 | 1.5 |
| | Yes | 200 | 98.5 |
| | Total | 203 | 100.0 |
| What is the recommended screening test for TB? | Blood Test | 52 | 25.6 |
| | Skin Test | 88 | 43.3 |
| | Mouth Test | 63 | 31.0 |
| | Total | 203 | 100.0 |
| TB screening methods you know | | | |
| Blood test | No | 77 | 37.9 |
| | Yes | 126 | 62.1 |
| | Total | 203 | 100.0 |
| Skin Test | No | 71 | 35.0 |
| | Yes | 132 | 65.0 |
| | Total | 203 | 100.0 |
| Mouth Test | No | 115 | 56.7 |
| | Yes | 88 | 43.3 |
| | Total | 203 | 100.0 |
| A Positive result of TB screening means | | | |
| Person has TB | No | 64 | 31.5 |
| | Yes | 139 | 68.5 |
| | Total | 203 | 100.0 |
| Latent TB | No | 140 | 69.0 |
| | Yes | 63 | 31.0 |
| | Total | 203 | 100.0 |
| False test | No | 185 | 91.1 |
| | Yes | 18 | 8.9 |
| | Total | 203 | 100.0 |
| The person introduced to the mycobacteria1 | No | 101 | 49.8 |
| | Yes | 102 | 50.2 |
| | Total | 203 | 100.0 |

**Figure 2: Source of Information on Tuberculosis Screening**

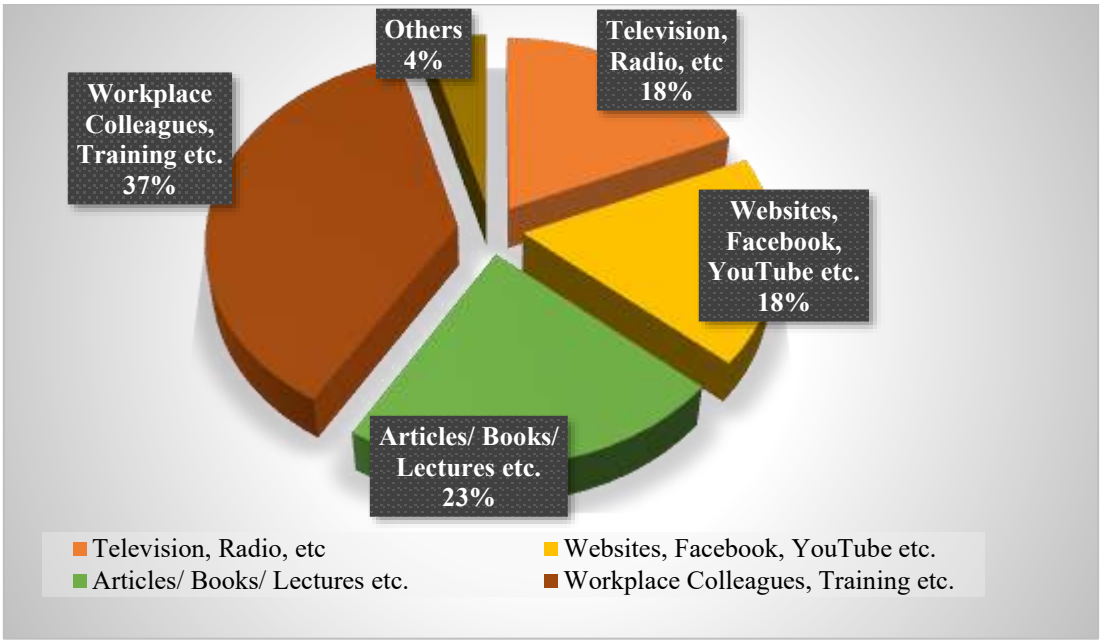
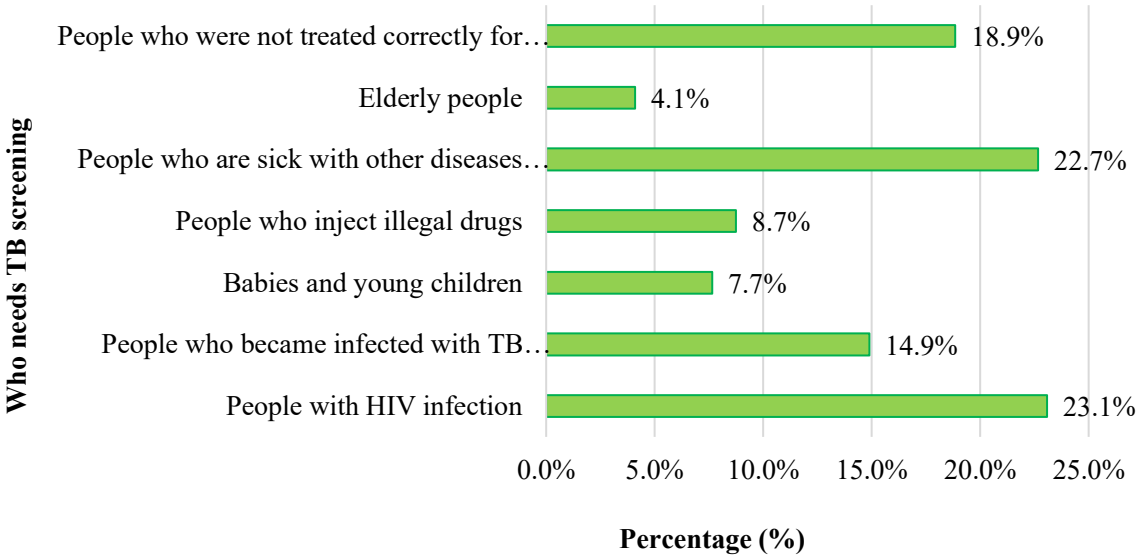



**Figure 3: Who needs to know about Tuberculosis Screening**




**TB screening understanding scores**

Overall, the understanding of TB screening among staff members was moderate. Specifically, 43.84% of them achieved an average score of 5. Pharmacists demonstrated slightly higher accuracy, with 4.73% achieving perfect scores compared to 7.27% of pharmaceutical support personnel. Across the board, 16.7% exhibited excellent knowledge (scoring 7-8 marks), while 57.65% had average knowledge (scoring 5-6 marks), and 26.6% showed poor knowledge (scoring 4 or below) regarding TB screening.

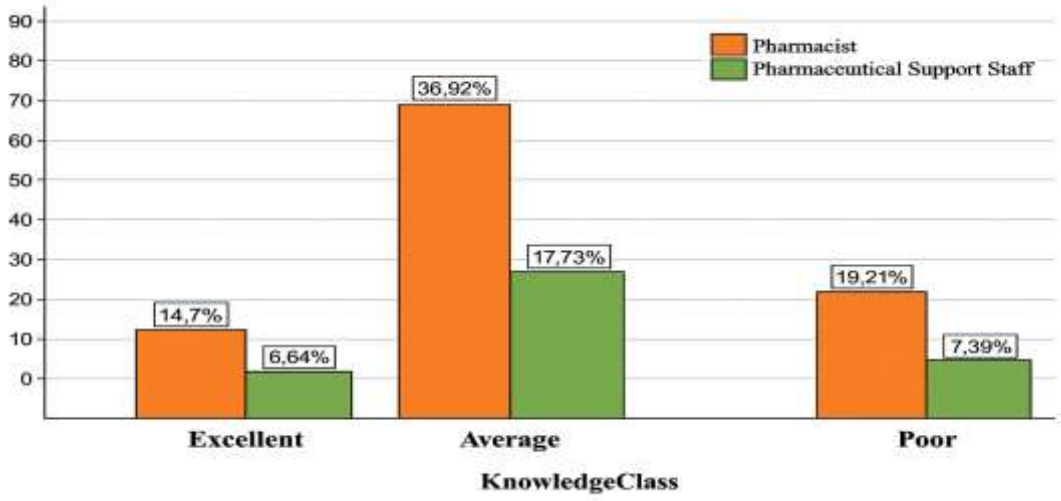
**Table 3: TB screening understanding scores**

| Scores * | Pharmacist Staffs n (%) | Pharmaceutical Support Staff n (%) | Total |
|---|---|---|---|
| 2 marks | 8 (5.41%) | 15 (27.27%) | 23 (11.33%) |
| 3 marks | 16 (10.81%) | 0 (0.00%) | 16 (7.88%) |
| 4 marks | 15 (10.14%) | 0 (0.00%) | 15 (7.39%) |
| 5 marks | 57 (38.51%) | 32 (58.18%) | 89 (43.84%) |
| 6 marks | 22 (14.86%) | 4 (7.27%) | 26 (12.81%) |
| 7 marks | 23 (15.54%) | 0 (0.00%) | 23 (11.33%) |
| 8 marks | 7 (4.73%) | 4 (7.27%) | 11 (5.42%) |
| Total | 148 (100) | 55(100) | 203(100) |

Scores* =Total marks is 8

Although there is a moderate level of recognition, the study reveals significant gaps in the knowledge and understanding of TB screening among healthcare professionals. Despite ongoing efforts to improve TB screening practices, specific challenges persist, underscoring the need for targeted interventions. Strengthening collaboration with global research institutions and adopting comprehensive strategies will be crucial in enhancing awareness and achieving effective TB control and eventual elimination.

**Figure 4: Understanding score Grades among respondents**




**TB Screening recognition of Workplace TB screening of Respondents**

Out of the respondents, only 41.4% were knowledgeable about the TB screening methods. However, the majority (72.4%) asserted their awareness of the distinctions among TB screening methods. A significant portion (95.1%) believed that BCG offered protection against Tuberculosis. Regarding adverse reactions to TB screening, the majority (53.2%) either didn't know or denied the existence of such reactions, while a minority (10.8%) affirmed that a person vaccinated with BCG still requires BCG.

**Table 4: recognition of Workplace TB screening of Respondents**

| Variable | Categories | Frequency | Percent (%) | Cum. Percent (%) |
|---|---|---|---|---|
| How many TB screening methods are are you aware of? | One | 32 | 15.8 | 15.8 |
| | Two | 84 | 41.4 | 57.1 |
| | Three | 68 | 33.5 | 90.6 |
| | Four | 15 | 7.4 | 98.0 |
| | None | 4 | 2.0 | 100.0 |
| | Total | 203 | 100.0 | |
| Are you aware of the differences in the screening test for TB? | No | 56 | 27.6 | 27.6 |
| | Yes | 147 | 72.4 | 100.0 |
| | Total | 203 | 100.0 | |
| Are you aware of any sensitization training workplace TB screening? | No | 104 | 51.2 | 51.2 |
| | Yes | 99 | 48.8 | 100.0 |
| | Total | 203 | 100.0 | |
| BCG vaccination is protective against TB? | False | 10 | 4.9 | 4.9 |
| | True | 193 | 95.1 | 100.0 |
| | Total | 203 | 100.0 | |
| Does a person vaccinated with BCG still needs BCG? | Yes | 22 | 10.8 | 10.8 |
| | No | 107 | 52.7 | 63.5 |
| | Don't Know | 74 | 36.5 | 100.0 |
| | Total | 203 | 100.0 | |
| Is it possible to have an adverse reaction from TB screening? | Yes | 95 | 46.8 | 46.8 |
| | No | 63 | 31.0 | 77.8 |
| | Don't Know | 45 | 22.2 | 100.0 |
| | Total | 203 | 100.0 | |

**TB screening recognition scores**

The findings indicate a significant level of awareness regarding TB screening among the respondents. Overall, 43.84% achieved an average score of 5. Notably, 30.77% of pharmaceutical support staff demonstrated excellent awareness compared to 69.23% of pharmacists. In total, 61.57% exhibited full awareness (scoring 3-5 marks) of TB screening, while 38.42% lacked awareness.

**Table 5: TB screening recognition scores**

| Awareness Score | Pharmacist n (%) | Pharma. Support personnel n (%) | Total |
|---|---|---|---|
| 0 marks | 0 (0.00%) | 4 (100.00%) | 4 (100.00%) |
| 1 mark | 23 (79.31%) | 6 (20.69%) | 29 (100.00%) |
| 2 marks | 34 (75.56%) | 11 (24.44%) | 45 (100.00%) |

| | | | |
|---|---|---|---|
| 3 marks | 22 (55.00%) | 18 (45.00%) | 40 (100.00%) |
| 4 marks | 42 (91.30%) | 4 (8.70%) | 46 (100.00%) |
| 5 marks | 27 (69.23%) | 12 (30.77%) | 39 (100.00%) |
| Total | 148 (72.91%) | 55 (27.09%) | 203 (100.00%) |

**Figure 5. Recognition Score Grades among respondents**

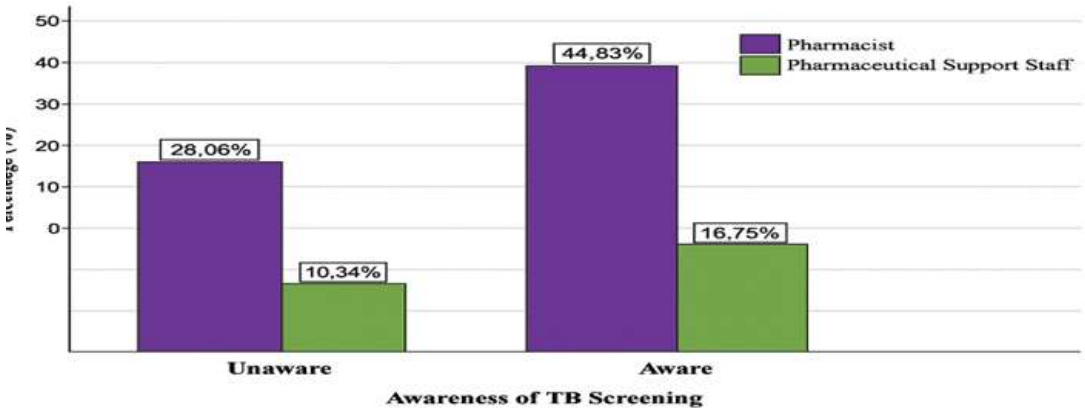



**Table 4. Difference in TB screening understanding and recognition Levels among staff groups**

An independent sample t-test was employed to assess the variance in knowledge and awareness levels of TB screening between pharmacists and pharmaceutical support staff. Results revealed a significant disparity in knowledge means between pharmacists and support staff (t(201), p=0.00), indicating that pharmacists exhibited significantly higher knowledge of TB screening (mean=5.12) compared to support staff (mean=4.47). However, no statistically significant difference was observed in the awareness levels of TB screening between pharmacists and support staff.

**Table 6: Difference in understanding and recognition among pharmaceutical personnel**

| Variables | | N | Mean (SD) | Mean Diff | t(df) | P-Value | 95% CL of Diff, |
|---|---|---|---|---|---|---|---|
| Knowledge | Pharmacist | 148 | 5.12(1.5) | 0.65 | 2.64(201) | 0.00 | 0.16-1.13 |
| | Support St | 55 | 4.47(1.7) | | | | |
| Awareness | Pharmacist | 148 | 3.11(1.4) | 0.23 | 1.06(201) | 0.29 | -0.20-0.67 |
| | Support St | 55 | 2.87(1.5) | | | | |

**Respondents' beliefs towards TB screening**

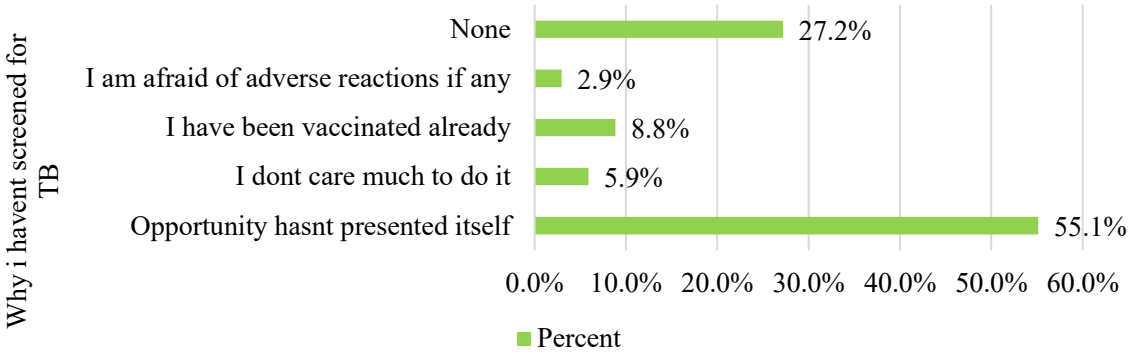
The findings reveal that a significant portion (61.1%) of respondents have not undergone TB screening but express a desire to do so (87.1%). Only 16.3% reported having been screened once or twice previously. The majority (51.1%) indicated their willingness to undergo screening if given the opportunity. However,

27.2% cited reasons for not being screened before, including fear of adverse reactions, lack of interest, or absence of a compelling reason.

**Table 7: Respondents' beliefs towards TB screening**

| Variable | Categories | Frequency | Percent (%) | Cum. Percent (%) |
|---|---|---|---|---|
| Have you had TB screening before? | No | 124 | 61.1 | 61.1 |
| | Yes | 79 | 38.9 | 100.0 |
| | Total | 203 | 100.0 | |
| | Checked | 37 | 18.2 | 100.0 |
| | Total | 203 | 100.0 | |
| Would you like to be screened in the near future? | Yes | 108 | 87.1 | 87.1 |
| | No | 16 | 12.9 | 100.0 |
| | Total | 124 | 100.0 | |
| How many times have you been Screened | Once | 19 | 9.4 | 9.4 |
| | Twice | 14 | 6.9 | 16.3 |
| | More than twice | 4 | 2.0 | 18.2 |
| | None | 166 | 81.8 | 100.0 |
| | Total | 203 | 100.0 | |

**Figure 6. Why haven't I been screened for TB**




**Beliefs towards TB screening grouped staff categories**

A larger proportion (41.82%) of pharmaceutical support staff reported not having undergone TB screening compared to 37.84% of pharmacists. Among pharmacists, a smaller percentage (5.41%) indicated a lack of interest in being screened, while none of the pharmaceutical support staff cited this reason. The primary reason for not being screened among both groups was the absence of an opportunity to do so, with 38.51% of pharmacists and 32.73% of pharmaceutical support staff mentioning this factor.

**Table .8: Beliefs towards TB screening by staff categories**

| Variables | Responses | Staff Category | | Total |
|---|---|---|---|---|
| | | Pharmacist | personnel | |
| Have you had TB screening? | No | 92 (62.16) | 32 (58.18) | 124 (61.08) |
| before? | Yes | 56 (37.84) | 23 (41.82) | 79 (38.92) |
| | Total | 148 (100) | 55 (100) | 203 (100) |
| If not, why? | | | | |
| The opportunity hasn't presented itself | Unchecked | 91 (61.49) | 37 (67.27) | 128 (63.05) |
| | Checked | 57 (38.51) | 18 (32.73) | 75 (36.95) |
| | Total | 148 (100) | 55 (100) | 203 (100) |
| I don't care much to do it | Unchecked | 140 (94.59) | 55 (100) | 195 (96.06) |
| | Checked | 8 (5.41) | 0 (0) | 8 (3.94) |
| | Total | 148 (100) | 55 (100) | 203 (100) |
| An opportunity came but was far from | Unchecked | 148 (100) | 55 (100) | 203 (100) |
| me/ didn't have time | Total | 148 (100) | 55 (100) | 203 (100) |
| I have been vaccinated already | Unchecked | 136 (91.89) | 55 (100) | 191 (94.09) |
| | Checked | 12 (8.11) | 0 (0) | 12 (5.91) |
| | Total | 148 (100) | 55 (100) | 203 (100) |
| I am afraid of adverse reactions if any | Unchecked | 148 (100) | 51 (92.73) | 199 (98.03) |
| | Checked | 0 (0) | 4 (7.27) | 4 (1.97) |
| | Total | 148 (100) | 55 (100) | 203 (100) |
| I haven't been counseled enough | Unchecked | 148 (100) | 55 (100) | 203 (100) |
| | Total | 148 (100) | 55 (100) | 203 (100) |
| I am always busy | Unchecked | 148 (100) | 55 (100) | 203 (100) |
| | Total | 148 (100) | 55 (100) | 203 (100) |
| None | Unchecked | 121 (81.76) | 45 (81.82) | 166 (81.77) |
| | Checked | 27 (18.24) | 10 (18.18) | 37 (18.23) |
| | Total | 148 (100) | 55 (100) | 203 (100) |

The majority of both pharmacists (86.96%) and pharmaceutical support staff (87.5%) expressed a desire to undergo TB screening shortly. Overall, 87.1% of respondents preferred to be screened shortly.

**Table 9: beliefs towards TB screening by staff categories cont.**

| Variables | Responses | Staff Category | | Total |
|---|---|---|---|---|
| | | Pharmacist | Support personnel | |
| Would you like to be screened in the | Yes | 80 (86.96) | 28 (87.50) | 108 (87.10) |
| near future? | No | 12 (13.04) | 4 (12.50) | 16 (12.90) |
| | Total | 92 (100) | 32 (100) | 124 (100) |
| How many times have you been | Once | 15 (10.14) | 4 (7.27) | 19 (9.36) |

| | | | | |
|---|---|---|---|---|
| Screened | Twice | 14 (9.46) | 0 (0) | 14 (6.90) |
| | More than twice | 4 (2.70) | 0 (0) | 4 (1.97) |
| | None | 115 (77.70) | 51 (92.73) | 166 (81.77) |
| | Total | 148 (100) | 55 (100) | 203 (100) |

**Discussion**

This research provides valuable insights into the sociodemographic characteristics, understanding, and recognition levels of tuberculosis (TB) screening among pharmacists and pharmaceutical support personnel. The discussion compares similar works globally and concludes by making recommendations. The study involved 205 participants, predominantly pharmacists (72.9%), with a mean age of 35 years. Gender distribution was relatively balanced, with 54.7% male respondents. Educational qualifications varied, with 41.4% holding post-graduate degrees. Understanding of TB Screening: Overall, the understanding of TB screening was moderate, with 16.7% exhibiting excellent understanding, 57.65% having average knowledge, and 26.6% demonstrating poor knowledge. Understanding gaps were observed regarding specific screening tests and the implications of positive results. Recognition of TB Screening: While awareness of TB screening methods was relatively high (72.4%), understanding about the tests themselves was lacking in some areas, particularly regarding adverse reactions and the necessity of BCG vaccination. Beliefs Towards TB Screening: A significant portion of respondents expressed a desire for TB screening, with reasons for not being screened including lack of opportunity, fear of adverse reactions, and prior vaccination. Comparison with Global Research: Similar studies conducted globally have shown variations in understanding and awareness levels of TB screening among healthcare professionals. For instance, a study by Kaliakbarova and Pak ( [5] in Kyrgyzstan found that healthcare workers exhibited diverse attitudes and understanding towards tuberculosis, reflecting the influence of local healthcare systems and cultural factors. Likewise, research by Chen et al. ( [6] in northeast China revealed disparities in knowledge, attitudes, and practices regarding TB among healthcare workers, highlighting the importance of tailored interventions to address specific challenges in different regions. These findings resonate with observations outlined in the World Health Organization's Global Tuberculosis Report 2020 (World Health Organization, [1] which underscores the need for comprehensive strategies to enhance TB screening practices and understanding among healthcare personnel worldwide. This study specifically assessed the understanding, beliefs, and recognition of Tuberculosis (TB) screening among pharmacists and pharmaceutical support staff, revealing a moderate level of knowledge with significant disparities between the two groups. With a mean age of 35 years and a male predominance of 54.7%, the demographic distribution mirrors similar studies conducted in healthcare settings in sub-Saharan Africa ( [7] et al., [8]et al.). The high representation of pharmacists (72.9%) compared to support staff (27.1%) was reflected in the differences in TB screening knowledge and recognition. Understanding of TB screening was moderate overall, with 16.7% of respondents demonstrating excellent knowledge, 57.65% showing average understanding, and 26.6% displaying poor understanding. These findings align with a study conducted in Nigeria by Iliyasu et al. ( [9] where only 15% of healthcare workers had excellent knowledge about TB screening, and more than half showed only an average understanding. A significant statistical difference in knowledge between pharmacists and support personnel ($p = 0.00$) highlights the need for targeted educational interventions, particularly among support staff. Interestingly, while pharmacists generally

performed better, a small proportion of support staff also attained perfect scores, suggesting pockets of high knowledge outside the professional hierarchy. In terms of recognition of TB screening methods, only 41.4% of respondents correctly identified the number of TB screening tests, although a large majority (72.4%) acknowledged differences in screening methods. Compared to a study in South Africa by Van Rensburg et al. ( [10], where 68% of healthcare workers could accurately identify and differentiate between TB screening modalities, the recognition levels in our cohort were relatively lower. Notably, while 95.1% correctly identified BCG vaccination as protective against TB—a positive indicator of baseline knowledge—only 10.8% knew that BCG-vaccinated individuals might still require screening. This reflects findings from a study in India by Sharma and Gupta ( [11], which reported similar misconceptions regarding BCG vaccination and TB screening. Sources of information on TB screening were primarily workplace-based (37%), followed by academic materials and media. This underscores the critical role of in-service training and institutional sensitization. However, only 48.8% reported having received any workplace sensitization training on TB screening. This gap is consistent with previous Ghanaian research by Amoako et al. [12], which highlighted inadequate continuous professional development opportunities regarding TB control. The findings from this study also reinforce the importance of clear communication regarding TB screening implications. Only half of the participants (50.2%) understood what a positive TB screening result means, revealing a critical knowledge gap that could impact clinical decision-making. This is of concern as it directly affects the early identification and referral of presumptive TB cases, particularly in high-TB-burden settings. Further Comparison with Other Studies. In Nigeria, Iliyasu et al. [9] found a similar knowledge pattern, where pharmacists scored higher on TB awareness, but support staff showed less understanding of TB control protocols. A South African study ( [10]Van Rensburg et al.) observed a significantly higher awareness and training uptake among healthcare workers due to national TB control programs integrated with regular health education. In India, Sharma & Gupta ( [11]2017) reported that misconceptions surrounding BCG and TB screening persist among healthcare workers, aligning with findings from the present study. A Ghanaian study by Amoako et al. ( [12] stressed the role of workplace sensitization, with similar recommendations for strengthening TB awareness through CPD and structured training programs. Additionally, efforts toward TB elimination in low-incidence countries have been outlined in frameworks proposed by Lönnroth et al. ( [2]and Awang et al. ( [13], emphasizing the importance of targeted interventions and surveillance systems. Furthermore, Pradipta et al. ( [14] conducted a systematic review highlighting the challenges and considerations regarding TB in healthcare workers in low-incidence settings. Factors influencing the acceptance and uptake of tuberculosis testing by healthcare workers have also been studied, as evidenced by the work of Bhebhe et al. [15] in South Africa. While some areas might exhibit higher awareness due to extensive public health campaigns or endemicity of TB, others may face challenges related to access to information and resources. Comparing findings with global research can highlight common trends and contextual differences in TB screening practices and understanding among healthcare personnel [16]. Saana I, I, et al. also found similar results [17]: [18].

**Importance of Patients' and Health Workers' Cultural Beliefs, Systems, and Understanding in TB Treatment**

The belief systems of both patients and health workers are critical in tuberculosis (TB) treatment. These systems influence how TB is perceived, how quickly care is sought, the degree of treatment adherence, and the success of TB control programs.

**1. Treatment Adherence**

Cultural beliefs directly affect adherence to TB medication. Some patients perceive TB as a spiritual illness, a curse, or a punishment from ancestors, which may lead them to rely on traditional remedies and discontinue biomedical treatment. At the same time, health workers who dismiss these cultural interpretations may alienate patients or create mistrust. As noted by Munro et al. (2007), adherence is a complex issue influenced by poverty, beliefs about TB, and the relationship between patients and providers [19].

**2. Health-Seeking Behavior and Delay**

In cultures where TB is associated with social stigma or disgrace, patients may avoid seeking timely care. Health workers' own biases or limited cultural competence can exacerbate this delay. For example, if a health worker believes that TB patients are irresponsible or likely to default, this attitude may be reflected in their communication style, thereby discouraging patients from engaging. A study in Ethiopia revealed that diagnostic delays were linked not only to patient fears and cultural stigma but also to health worker attitudes and communication gaps [20].

**3. Stigma, Bias, and Communication Gaps**

The social stigma attached to TB can be intensified when health workers themselves hold judgmental beliefs. When health providers label or blame patients (consciously or subconsciously), the quality of care suffers, and patients may withdraw from follow-up. Courtwright and Turner (2010) describe multiple pathways through which stigma, including from healthcare providers, undermines TB control efforts and promotes secrecy, fear, and treatment non-compliance [21]

**4. Integration of Traditional and Spiritual Systems**

In many African and Asian contexts, patients first consult traditional or spiritual healers. Health workers who understand and respect this may engage such community figures as allies, leading to better referral and support systems. Those who reject traditional systems outright risk alienating patients or causing them to "switch providers" mid-treatment. The World Health Organization has documented how engaging conventional healers in Ethiopia, Ghana, and Tanzania improved TB detection and outcomes [22]

**5. Health Worker Beliefs Affecting Diagnosis and Management**

Health workers are not immune to the influence of cultural stereotypes and societal norms. Some may subconsciously stigmatize TB patients or assume they are non-adherent or contagious, which can lead to late diagnosis, poor counseling, or even refusal of care. This undermines patient trust and overall TB control efforts. Liefooghe et al. (1997) emphasized that the success of TB programs depends on the perceptions of both patients and health workers. Misunderstandings and negative attitudes among providers reduced patients' willingness to seek care [23]

**Limitations:**

Sample Size and Representation: The study's sample size might not be representative of all healthcare settings, potentially limiting generalizability to broader populations.

Data Collection Methods: The reliance on self-reported surveys may introduce response biases, potentially affecting the accuracy of the collected data.

Geographic Focus: The study's focus on a specific geographic location may limit its applicability to other regions with different healthcare systems and TB burdens.

**Conclusion**:

Although there is a moderate level of recognition, the study reveals significant gaps in the knowledge and understanding of TB screening among healthcare professionals. 16.7% of the participants demonstrated excellent understanding, 57.65% had average, and 26.6% exhibited poor understanding regarding TB screening. Despite ongoing efforts to improve TB screening practices, specific challenges persist, underscoring the need for targeted interventions. Strengthening collaboration with global research institutions and adopting comprehensive strategies will be crucial in enhancing awareness and achieving effective TB control and eventual elimination. The cultural beliefs and understanding of both patients and health workers are vital components of effective TB control. Addressing these beliefs through culturally sensitive training, education, community engagement, and mutual respect can greatly improve adherence, reduce stigma, and enhance health outcomes.

**Recommendations**.

1. **Continuous Education and Training**: Implement regular training programs for healthcare personnel to enhance their understanding of TB screening methods, the interpretation of results, and the management of TB cases.
2. **Public Health Campaigns:** Conduct awareness campaigns targeting healthcare workers and the general population to promote TB screening, prevention, and treatment.
3. **Integration of TB Services:** Integrate TB screening services into routine healthcare settings to improve access and uptake among vulnerable populations.
4. **Research Collaboration:** Foster collaboration with global research institutions to benchmark findings, share best practices, and develop evidence-based interventions for TB control and elimination.
5. **Addressing Specific Challenges:** Identify and address specific challenges faced by healthcare workers, such as fear of adverse reactions, lack of resources, and logistical barriers to screening.
6. **Monitoring and Evaluation:** Establish robust surveillance systems to monitor TB screening practices, identify areas for improvement, and measure the impact of interventions over time.

**References**

1. WHO, "Global TB Report," Tuberculosis, p. https://apps.who.int, 14 October 2020.
2. K. M. G. B. A. I. D. L. d. V. G. D. R. .. &. Z. D. Lönnroth, "Lönnroth, K., Migliori, G. B., Abubakar, I., D'Ambrosio, L., Towards tuberculosis elimination: an action framework for low-incidence countries.," Lönnroth, K., Migliori, G. B., Abubakar, I., D'Ambrosio, L., de Vries, G., Diel, R., ... & Zenner, D. (2015). Towards tuberculEuropean Respiratory Journal, pp. Lönnroth, K., Migliori, G. B., Abubakar, I., D'Ambrosio, L., de Vries, G., Diel, R., ... & Zenner, D. (2015). Towards tuberculosis e45(4), 928-952., 2015.
3. A. M. Bayer, "Knowledge, attitudes, and practices related to tuberculosis in pharmacy workers in a cross-sectional survey," Bayer, A. M. (2018). Knowledge, attitudes, and practices related to tuberculosis in pharmacy workers in a cross-s PLOS ONE, , pp. Bayer, A. M. (2018). Knowledge, attitudes, and practices related to tuberculosis in pharmacy workers in a c13(7), e0196648. https://doi.org/10.1371/journal.pone.0196648 , 2018.
4. P. T. N. A. P. &. A. P. B. Tabong, "Tabong, P. T. N., Akweongo, P., & Ad Community beliefs about tuberculosis in Ghana: Implications for the end tuberculosis global agenda.," Tabong, P. T. N.,

Akweongo, P., & Adongo, P. B. (2021). Community beliefs about tuberculosis in Ghana: Implications fo Cogent Medicine, , pp. Tabong, P. T. N., Akweongo, P., & Adongo, P. B. (2021). Community beliefs about tuberculosis in Ghana: Implications fo8(1). https://doi.org/10.1080/2331205X.2020.1870069, 2021.

5. G. &. P. A. Kaliakbarova, "KaliakbaUnderstanding and attitudes towards tuberculosis among healthcare workers in Kyrgyzstan: a qualitative study.," Infectious Diseases, pp. 19(1), 1-9., 2019..
6. L. C. L. C. D. W. Q. X. L. Z. W. .. &. C. M. Chen, "Chen, L., Cheng, L., Chen, D., Wu, Q., Xu, L., Zhang, W., ..Knowledge, attitudes and practices on tuberculosis among health care workers in northeast China.," Chen, L., Cheng, L., Chen, D., Wu, Q., Xu, L., Zhang, W., ... & Chen, M. (2019). Knowledge, attitudes a BMC Infectious Diseases, pp. Chen, L., Cheng, L., Chen, D., Wu, Q., Xu, L., Zhang, W., ... & Chen, M. (2019). Knowledge, attitudes a 19(1), 1-9., 2019.
7. E. O. J. &. A. D. Osei, "Osei, E.Awareness and perception of tuberculosis among pharmacy staff in Ghana: Implications for control and prevention.," Osei, E., Oppong, J., & Acheampong, D. (2020). Awareness and perception of tuberculosis among pharmacy staff i International Journal of Mycobacteriology, pp. Osei, E., Oppong, J., & Acheampong, D. (2020). Awareness and perception of tuberculosis among pharmacy staff i 9(3), 310–316, 2020.
8. A. I. D. M. &. Y. H. Bello, "Bello, A. I.,Demographic factors associated with tuberculosis knowledge among pharmacy workers in Abuja, Nigeria.," Bello, A. I., Dankyau, M., & Yusuph, H. (2019). Demographic factors associated with tubercu Journal of Infectious Diseases and Immunity, , pp. Bello, A. I., Dankyau, M., & Yusuph, H. (2019). Demographic factors associated with tuberculos 11(2), 10–17, 2019.
9. G. A. I. S. K. M. &. M. F. Iliyasu, "Iliyasu, G., Abubakar, I. S., Kabi Knowledge of tuberculosis among healthcare workers in a Nigerian tertiary hospital.," Iliyasu, G., Abubakar, I. S., Kabir, M., & Muktar, F. (2018). Knowledge o Annals of African Medicine, 17(1), 1–7., pp. 17(1), 1–7., 2018.
10. C. J. A. &. N. L. .. Van Rensburg, "Van Rensburg, C., JaffHealthcare worker knowledge of TB screening protocols in high-burden areas of South Africa.," Van Rensburg, C., Jaffer, A., & Ncube, L. (2021). Healthcare worker knowledge of TB screening pSouth African Journal of Epidemiology and Infection, , pp. Van Rensburg, C., Jaffer, A., & Ncube, L. (2021). Healthcare worker knowledge of TB screening protoc36(1), 1–7., 2021.
11. V. &. G. S. Sharma, " BCG vaccination and TB screening knowledge among healthcare providers in India.," Indian Journal of Public Health, , pp. , 61(1), 54–58., 2017.
12. Y. A. A. E. &. B. N. Y. Amoako, "Amoako, Y. A., Asiedu, Knowledge, attitudes, and practices of healthcare workers regarding tuberculosis in Ghana. .," Ghana Medical Journal, pp. 50(4), 233–240., 2016.
13. J. B. S.-P. H. J. &. A. Y. Awang, "Conceptual framework of tuberculosis control and elimination in low-incidence countries.," Awang, J. B., Sánchez-Pérez, H. J., & Assefa, Y. (2018). Conceptual framework of tuberculosis control Journal of Infection in Developing Countries, 12(11), 897-902., pp. Awang, J. B., Sánchez-Pérez, H. J., & Assefa, Y. (2018). Conceptual framework of tuberculosis contro 12(11), 897-902., Awang, J. B., Sánchez-Pérez, H. J., & Assefa, Y. (2018). Conceptual framework of tuberculosis control2018..
14. I. S. F. L. D. &. B. J. Pradipta, "Pradipta, I. S., Forsman, Tuberculosis in healthcare workers in low-incidence settings: a systematic review.," European Respiratory Journal, pp. 52(5), 1800507, 2018.

15. L. T. V. R. C. &. S. W. J. Bhebhe, "Bhebhe, L. T., Van Rooyen, C., & Attitudes, knowledge, and practices of healthcare workers regarding occupational exposure to pulmonary tuberculosis.," Bhebhe, L. T., Van Rooyen, C., & Steinberg, W. J. (2014). Attitudes, knowledge, and practices of healthcare workers regarding occupational e Afr J Prim Health Care Fam Med, , pp. Bhebhe, L. T., Van Rooyen, C., & Steinberg, W. J. (2014). Attitudes, knowledge, and practices of healthcare workers regarding occupational e 6(1), E1-6. https://doi.org/10.4102/phcfm.v6i1.5, 2014.
16. A. S. J. B. J. B. M. B. E. &. T. C. A. Cernasev, "Cernasev, A., Stillo, J., Blac Pharmacists' Role in Global TB Elimination: Practices, Pitfalls, and Potential.," Cernasev, A., Stillo, J., Black, J., Batchu, M., Bell, E., & Tschampl, C. A. (2024, June). PharmacistIn Healthcare , pp. Cernasev, A., Stillo, J., Black, J., Batchu, M., Bell, E., & Tschampl, C. A. (2024, June). Pharmacis (Vol. 12, No. 11, p. 1137). MDPI., 2024.
17. I. I. A. P. K. A. D. N. A. M. K. A. F. A. A. R. Y. I. A. &. A. F. N. Saana, "Saana, I. I., Amoo, P. K., Ankrah, D. N. A., Marfoh, K., Akum, F. A., Achiak, R., Yahaya, I. A., Patients' understanding of their tuberculosis (TB) medications and their awareness of lifestyle modifications for post TB living.," Texila International Journal of Public Health, p. 9(2). https://doi.org/10.21522/TIJPH.2013.09.02.Art032, 2021.
18. R. A. T. T. &. I. O. M. Adisa, "Adisa, R., Ayandokun,Knowledge about tuberculosis, treatment adherence and outcome among ambulatory patients with drug-sensitive tuberculosis in two directly-observed treatment centres in Southwest Nigeria.," BMC Public Health, , pp. Adisa, R., Ayandokun, T. T., & Ige, O. M. (2021). Knowledge about tuberculosis, treatment adherence and outcome among ambulatory patients with drug-sensitive tuberculosis in two directly-observed treatment centres in Southwest Nigeria. BMC Public Health, , 2021 .
19. S. A. L. S. A. S. H. J. E. M. E. F. A. &. V. J. Munro, "Munro, S. A., Lewin, S. A., Smith, H. J., Engel, M. Patient adherence to tuberculosis treatment: a systematic review of qualitative research.," Munro, S. A., Lewin, S. A., Smith, H. J., Engel, M. E., Fretheim, A., & Volmink, J. (2007). Patient adherence to tuberculosis treatment: a systPLoS Medicine, , Vols. Munro, S. A., Lewin, S. A., Smith, H. J., Engel, M. E., Fretheim, A., & Volmink, J. (2007). Patient adherence to tuberculosis treatment: a sys4, no. Munro, S. A., Lewin, S. A., Smith, H. J., Engel, M. E., Fretheim, A., & Volmink, J. (2007). Patient adherence to tuberculosis treatment: a system(7), e238. https://doi.org/10.1371/journal.pmed.0040238, pp. Munro, S. A., Lewin, S. A., Smith, H. J., Engel, M. E., Fretheim, A., & Volmink, J. (2007). Patient adherence to tuberculosis treatment: a systemae238. , 2007.
20. S. B. G. &. A. G. Yimer, "Diagnostic and treatment delay among pulmonary tuberculosis patients in Ethiopia: a cross sectional study.," Yimer, S., Bjune, G., & Alene, G. (2009). Diagnostic and treatment delay among pulmonary tuberculosis p BMC Public Health, Vols. Yimer, S., Bjune, G., & Alene, G. (2009). Diagnostic and treatment delay among pulmonary tuberculosis pati 9, no. Yimer, S., Bjune, G., & Alene, G. (2009). Diagnostic and treatment delay among pulmonary tuberculosis pat(1), 53. https://doi.org/10.1186/1471-2458-9-53, pp. Yimer, S., Bjune, G., & Alene, G. (2009). Diagnostic and treatment delay among pulmonary tuberculosis patient 53, 2009.
21. A. &. T. A. N. Courtwright, "Tuberculosis and stigmatization: pathways and interventions.," Courtwright, A., & Turner, A. N. (2010). Tuberculosis and stigmatization: pathwa Public Health Reports, vol. Suppl 4, no. Courtwright, A., & Turner, A. N. (2010). Tuberculosis and stigmatization: pathways 34–42. https://doi.org/10.1177/00333549101250S407, p. 125, 2010.

22. W. H. Organisation, "Engaging Traditional Healers in TB Control: Experience from Ethiopia, Ghana, and Tanzania. WHO Regional Office for Africa.," World Health Organization. (2008). Engaging Traditional Healers in TB Control: Experience frWHO Regional Office for Africa., World Health Organization. (2008). Engaging Traditional Healers in TB Control: Experience from Ethio WHO Regional Office for Africa. https://apps.who.int/iris/handle/10665/116442, 2008.
23. R. M. N. H. S. M. M. B. &. D. M. A. Liefooghe, "Liefooghe, R., Michiels, N., Habib, S., Mora Perception and social consequences of tuberculosis: a focus group study of tuberculosis patients in Sialkot," Liefooghe, R., Michiels, N., Habib, S., Moran, M. B., & De Muynck, A. (1997). Perception and social consequences of tuberculosis: a focus Social Science & Medicine, Vols. Liefooghe, R., Michiels, N., Habib, S., Moran, M. B., & De Muynck, A. (1997). Perception and social consequences of tubercu(12), no. Liefooghe, R., Michiels, N., Habib, S., Moran, M. B., & De Muynck, A. (1997). Perception and social consequences of tuberculosis: a focus group 1685–1692. https://doi., pp. Liefooghe, R., Michiels, N., Habib, S., Moran, M. B., & De Muynck, A. (1997). Perception and social consequences of tuberculosis: a focus group 41, 1997.