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Assessing Healthcare Workers' Knowledge of Tuberculosis Case Detection in Wassa Amenfi West Municipal, Ghana

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Abstract

Background: Tuberculosis (TB) remains a leading public health threat, particularly in sub-Saharan Africa, where delayed case detection contributes significantly to disease transmission and mortality. Despite the availability of effective diagnostic tools and treatment, Ghana continues to face challenges in early TB case identification. This study assessed the knowledge levels of healthcare workers regarding TB case detection in Wassa Amenfi West Municipal, Ghana.

Methods: A descriptive cross-sectional design was employed, targeting 146 healthcare workers across various facilities. Stratified random sampling ensured representation among physicians, nurses, laboratory technicians, and public health officers. Data were collected using structured questionnaires assessing knowledge on TB symptoms, transmission, diagnostic methods, and detection practices. Statistical analyses were conducted using SPSS, applying descriptive statistics, chi-square tests, ANOVA, and regression models to determine associations between knowledge levels and demographic factors.

Results: The findings revealed significant knowledge gaps among healthcare workers. While 88.4% correctly identified airborne transmission, 31% erroneously believed TB is caused by a virus. Years of experience and educational level were significantly associated with knowledge of TB symptoms and case detection procedures ($p < 0.05$). Most respondents (65.1%) rated their knowledge and confidence as moderate. Regression analysis indicated that employment status and professional role significantly influenced the choice of diagnostic samples, while higher education correlated positively with TB knowledge. A concerning 73% believed it was not possible to distinguish between active and latent TB using symptoms and standard diagnostic tests.

Conclusion: Although healthcare workers in Wassa Amenfi West Municipal demonstrate general awareness of TB transmission and symptoms, critical misconceptions persist. Professional role, education, and years of experience significantly

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affect knowledge and detection practices. Strengthening training programs, standardizing diagnostic protocols, and fostering inter-professional collaboration are essential for improving TB case detection and ultimately reducing transmission.

Keywords: Tuberculosis, Case Detection, Healthcare Workers, Knowledge, Ghana, TB Diagnosis, TB Training, Latent TB

Introduction

Tuberculosis (TB) continues to be one of the world's most significant public health threats, ranking alongside HIV/AIDS as a leading cause of illness and death globally. In 2014, approximately 9.6 million new TB cases were reported worldwide, resulting in 1.5 million deaths [1]. The impact of infectious diseases like TB is particularly severe in low- and middle-income countries, where health systems and economies are often less resilient to such burdens [2]. Ghana, as a lower-middle-income country, faces similar challenges.

According to the World Health Organization [3], TB is responsible for nearly three million deaths each year, with the vast majority occurring in developing nations. Notably, about 80% of these fatalities are among individuals in their most economically productive years. The African continent bears a disproportionate share of the global TB burden, accounting for 28% of cases and exhibiting the highest incidence relative to population size-281 cases per 100,000 people, which is more than twice the global average of 133 per 100,000 [4]. In Ghana alone, 2014 saw an estimated 44,000 new TB cases, equating to 165 new infections per 100,000 population, placing the country among those with the highest TB incidence rates globally [4].

Despite the availability of effective TB treatments since the mid-20th century and significant improvements in social and economic conditions worldwide, TB remains a persistent and devastating disease, particularly in sub-Saharan Africa [5]. The global distribution of TB shows that Asia and Africa together account for the majority of cases, with Africa alone responsible for roughly a quarter of the world's TB incidence. In 2019, while an estimated 10 million people globally developed TB, only about 71% of these cases were reported to health authorities. The remaining 29% included both diagnosed cases that went unreported and individuals who were never diagnosed, highlighting significant gaps in case detection [6].

In response to these challenges, the international community set an ambitious goal in 2016 to end the TB epidemic. This objective, adopted at the World Health Assembly in 2014 and integrated into Sustainable Development Goal (SDG) 3, calls for a 90% reduction

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in TB deaths and an 80% reduction in new cases by 2030, compared to 2015 levels [7,8]. Achieving these targets requires robust strategies for early detection and effective management of TB cases.

A critical factor in improving TB control is the knowledge and awareness of healthcare workers regarding TB case detection. Their understanding of the disease, its symptoms, and the diagnostic process directly influences the success of national and local TB programs. This study, therefore, investigates the knowledge and practices related to TB case detection among healthcare workers in the Wassa Amenfi West Municipal area of Ghana's Western Region, aiming to identify gaps and inform targeted interventions.

Methodology

Study Design

This study employed a **descriptive cross-sectional design** to assess the knowledge levels of healthcare workers regarding tuberculosis (TB) case detection in Wassa Amenfi West Municipal, Ghana. The design was selected to provide a snapshot of current knowledge and practices across different healthcare cadres at a specific point in time.

Study Area

The study was conducted in Wassa Amenfi West Municipal, located in the Western Region of Ghana. The municipality is characterized by a mix of urban and rural settlements with multiple health facilities providing primary and secondary care, including TB diagnostic and treatment services.

Study Population

The target population comprised healthcare workers (HCWs) involved in TB care and general patient management. These included medical doctors, nurses, physician assistants, public health officers, laboratory technicians, disease control officers, and other frontline staff across public and private health facilities in the municipality.

Sample Size and Sampling Technique

A total of **146 healthcare workers** were recruited using **stratified random sampling**. The sample size was determined based on estimated population proportions and a margin of error acceptable for public health studies. Stratification ensured adequate representation across different professional categories and levels of healthcare delivery (primary, secondary, and outreach).

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Data Collection Instrument

Data was collected using a **structured, self-administered questionnaire**, developed based on WHO guidelines and TB case detection protocols. The questionnaire consisted of closed-ended and Likert scale items assessing knowledge on TB transmission, symptomatology, diagnostic approaches, and perceptions of case detection accuracy. The instrument was pretested for clarity and reliability in a neighboring district before full deployment.

Data Collection Procedure

Trained research assistants distributed and retrieved the questionnaires at various healthcare facilities. Participation was voluntary and anonymous. Respondents were given adequate time to complete the questionnaire during non-peak working hours to avoid disruption of clinical services.

Data Analysis

Data was entered into and analyzed using SPSS version 25. Descriptive statistics (frequencies, means, and standard deviations) were used to summarize demographic and knowledge-related variables. Chi-square tests and ANOVA were employed to assess associations between demographic factors and knowledge scores. Binary logistic regression and multinomial regression analyses were conducted to identify predictors of knowledge levels and diagnostic behavior. A significance level of $p < 0.05$ was considered statistically significant.

Ethical Considerations

Ethical clearance for the study was obtained from the Ethical Review Board of the Catholic University of Ghana. Permissions were also secured from the Wassa Amenfi West Municipal Health Directorate and facility heads. Informed consent was obtained from all participants prior to data collection, and strict confidentiality was maintained throughout the study.

Results

Table 1: Background Information of Healthcare Workers

Variable	Category	Frequency (N=146)	Percentage (%)
Gender	Male	61	41.8
	Female	85	58.2
	Total	**146**	**100.0**

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Age	18-24	8	5.5
	25-34	83	56.8
	35-44	45	30.8
	45-54	4	2.7
	55 and above	6	4.1
	Total	**146**	**100.0**
Professional Role	Physician	10	6.8
	Nurse	98	67.1
	Laboratory Technician	16	11.0
	Public Health	22	15.1
	Total	**146**	**100.0**
Years of Experience	1-5years	79	54.1
	6-10years	23	15.8
	11-15 years	28	19.2
	16-20years	7	4.8
	>21 years	9	6.2
	Total	**146**	**100.0**
Educational Qualification	Diploma	75	51.4
	Bachelor's degree	53	36.3
	Master's degree	6	4.1
	other (please specify)	12	8.2
	Total	**146**	**100.0**

From Table1, a total of 146 healthcare workers participated in the study, with the majority being female (58.2%) compared to male participants (41.8%). The age distribution revealed that the largest group of healthcare workers fell in the 25-34 age range (56.8%), followed by those aged 35-44 (30.8%). Among the professional roles, nurses were the most prominent (67.1%), while physicians, laboratory technicians, and public health workers accounted for 6.8%, 11.0%, and 15.1%, respectively. In terms of experience, a significant proportion of healthcare workers had 1-5 years of experience (54.1%), with smaller percentages in the 6-10 years (15.8%), 11-15 years (19.2%), 16-20 years (4.8%), and >21 years (6.2%) categories. Regarding educational qualifications, the majority held a diploma (51.4%), followed by a bachelor's degree (36.3%), a master's degree (4.1%), and other qualifications specified by 8.2% of the participants. These demographic characteristics provide valuable insights into the composition of the healthcare worker sample and their potential implications for the study on factors influencing low TB case detection in the Wassa Amenfi West Municipal.

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Figure 1: The Primary cause of TB

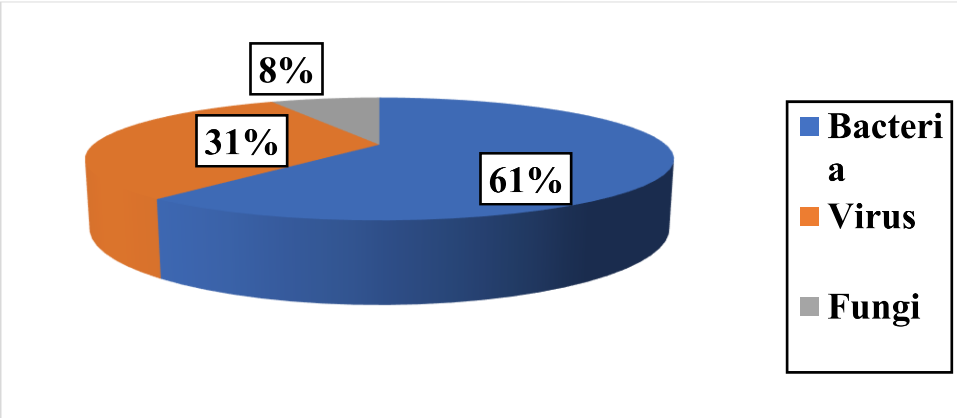

Figure 1 highlights respondents' perceptions regarding the primary cause of tuberculosis (TB). The majority of respondents (61%) correctly attribute TB to bacteria, which aligns with scientific understanding as Mycobacterium tuberculosis is the causative bacterium. However, it is noteworthy that a substantial proportion (31%) of respondents believe TB is caused by a virus, and a smaller percentage (8%) associates it with fungi.

Table 2: How TB is Transmitted from Person to Person

Category	Frequency (N=146)	Percentage (%)
Through food and water	3	2.1
Through sexual contact	5	3.4
Through the air	129	88.4
Through direct skin contact	9	6.2
Total	**146**	**100.0**

Table 2 illustrates the perceived modes of TB transmission among respondents. The results reveal that the majority (88.4%) correctly identify the airborne route as the primary means of TB transmission, aligning with the accurate understanding of TB transmission. However, there are some misconceptions, with 6.2% of respondents believing in transmission through direct skin contact, 3.4% through sexual contact, and 2.1% through food and water, despite these modes being less common or inaccurate for TB transmission.

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Table 3: Crosstabulation for Years of Experience and Respondents knowledge on Cardinal Symptoms of TB

Years of Experience	Cardinal Symptoms								Chi-Square
	Cough more than 2 weeks	**Cough of any duration**	**Chest pain**	**Joint pain**	**Weight loss**	**Night sweats**	**Fever**	**Total**	**53.458a**
1-5 years	39	4	12	0	3	5	16	**79**	
6-10 years	7	0	6	1	1	4	4	**23**	
11-15 years	14	0	8	0	1	5	0	**28**	
16-20 years	0	0	0	0	0	0	7	**7**	
>21 years	6	0	1	0	0	0	2	**9**	
Total	66	4	27	1	5	14	29	146	

Table 3 displays a crosstabulation of years of experience in healthcare and their ability to identify cardinal symptoms associated with tuberculosis (TB). Notably, the most prevalent symptom identified by healthcare workers was a cough lasting more than 2 weeks, with the highest frequency among healthcare workers with 1-5 years of experience (39 cases) and 11-15 years of experience (14 cases). Conversely, there were no reported cases of a cough of any duration identified among healthcare workers with 6-10 years or 16-20 years of experience. Chest pain and joint pain are fewer common symptoms, with the majority of reports coming from the "1-5 years" category. Other symptoms like weight loss, night sweats, and fever are reported by healthcare workers with varying frequencies across experience categories.

Table 4: Chi-Square Test Results for Years of Experience and knowledge on Cardinal Symptoms of TB

Chi-Square Test Results	**Value**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	53.458a	.001
Likelihood Ratio	53.415	.001
Linear-by-Linear Association	.804	.370

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N of Valid Cases	**146**	

Note: Sig.<0.05=significant & Sig.>0.05=Insignificant

The Chi-Square test results in Table 4 reveals significant associations between healthcare workers' years of experience and their ability to recognize the cardinal symptoms of TB in clients. Both the Pearson Chi-Square and Likelihood Ratio tests yielded p-values of 0.001, indicating a strong statistical significance. In contrast, the Linear-by-Linear Association test, with a p-value of 0.370, did not demonstrate a significant linear relationship between the variables.

Table 5: Crosstabulation for Level of Qualification and Cardinal Symptoms

Highest Education Level	Cardinal Symptoms								Chi-Square
	Cough more than 2 weeks	**Cough of any duration**	**Chest pain**	**Joint pain**	**Weight loss**	**Night sweats**	**Fever**	**Total**	
Diploma	39	2	15	1	1	8	9	**75**	**39.431[a]**
Bachelor's Degree	20	1	10	0	4	4	14	**53**	
Master's Degree	0	0	0	0	0	0	6	**6**	
Other	7	1	2	0	0	2	0	**12**	
Total	66	4	27	1	5	14	29	146	

The table shows the Chi-Square test results for the relationship between healthcare workers' highest education level and their recognition of cardinal symptoms of TB. The Chi-Square statistic is used to assess the independence between education levels and the ability to identify specific TB symptoms. The results indicate that there is a statistically significant association between healthcare workers' highest education level and their ability to recognize certain TB symptoms. The Chi-Square test, with a value of 39.431 and a p-value of .002, suggests that there is a significant relationship.

Table 6: Crosstab for Years of Experience in Healthcare vs. TB Case Detection Samples

	Which of the following samples are typically taken for TB case detection?	**Chi-Square**

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Years of experience						
	Blood	Sputum	Cerebrospinal fluid	Gastric Lavage	**Total**	
1-5 years	26	47	1	5	**79**	**30.733[a]**
6-10years	8	14	0	1	**23**	
11-15 years	3	25	0	0	**28**	
16-20years	7	0	0	0	**7**	
>21 years	0	9	0	0	**9**	
Total	**44**	**95**	**1**	**6**	**146**	

The table presents a crosstabulation of the years of experience in healthcare and the types of samples typically taken for TB case detection, along with the corresponding Chi-Square values. The Chi-Square value of 30.733a indicates a statistically significant association between years of experience and the choice of samples. Looking at the data, it is evident that healthcare professionals with 1-5 years of experience are more likely to collect sputum samples (47 out of 79) for TB case detection, while those with 6-10 years of experience collect fewer sputum samples (14 out of 23). Conversely, healthcare professionals with over 21 years of experience seldom collect sputum samples (9 out of 9). This crosstabulation suggests that years of experience may influence the choice of samples for TB case detection, making it a significant factor to consider in healthcare practice.

Table 7: Chi-Square Test for Years of Experience in Healthcare vs. TB Case Detection Samples

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	30.733	12	0.002
Likelihood Ratio	36.387	12	0.000

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Linear-by-Linear Association	0.183	1	0.668
N of Valid Cases	146		

The Chi-Square Test for the association between years of experience in healthcare and the choice of TB case detection samples reveals some important insights. Both the Pearson Chi-Square and Likelihood Ratio tests yielded statistically significant results, with p-values of 0.002 and 0.000, respectively. This indicates a significant relationship between years of experience and knowledge on type of samples collected for TB case detection. However, the Linear-by-Linear Association test resulted in a non-significant p-value of 0.668, suggesting that there might not be a linear trend in the association between years of experience and sample choice.

Table 8: How TB is commonly detected in individuals

Category	Frequency (N=146)	Percentage (%)
Through a chest X-ray	25	17.1
Through a sputum sample analysis using GeneXpert	46	31.5
Through microscopy (AFB) Acid-fast Bacilli	49	33.6
Culture & Drug Sensitivity Test (DST)	20	13.7
Through a CT scan	2	1.4
Full Blood Count	4	2.7
Total	**146**	**100.0**

Table 4.19 offers valuable insights into the common methods utilized for the detection of tuberculosis (TB) in individuals. Within the surveyed group of 146 individuals, the data reveals that a significant portion of TB cases are commonly detected through sputum sample analysis using GeneXpert, accounting for 31.5% of the cases. Microscopy (AFB) Acid-fast Bacilli analysis also plays a prevalent role, representing 33.6% of the total detections. Chest X-rays and Culture & Drug Sensitivity Tests (DST) are additional significant contributors, with 17.1% and 13.7%, respectively. In contrast, CT scans and Full Blood Count tests play a more limited role, comprising 1.4% and 2.7% of the detections, respectively.

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Table 9: How TB is diagnosed

Response	***Frequency (N=146)***	***Percentage (%)***
Through clinical diagnosis (signs & symptoms & Chest X-ray).	*71*	*48.6*
Through bacteriological diagnosis (e.g., GeneXpert.	*72*	*49.3*
Through clinical judgment (decisions about patient care based on clinical knowledge & experience.	*3*	*2.1*
Total	***146***	***100.0***

Table 9 provides insights into the methods commonly used for diagnosing tuberculosis (TB) within a cohort of 146 respondents, reflecting health workers' knowledge on TB diagnosis. The data reveals that TB diagnosis primarily relies on two key approaches: bacteriological diagnosis, exemplified by techniques like GeneXpert, which accounts for 49.3% of diagnoses, and clinical diagnosis based on signs, symptoms, and chest X-rays, representing 48.6% of cases. A smaller proportion, 2.1%, is based on clinical judgment, reflecting decisions informed by healthcare professionals' clinical knowledge and experience.]

Figure 2: Perceptions on Active and Latent Tuberculosis.

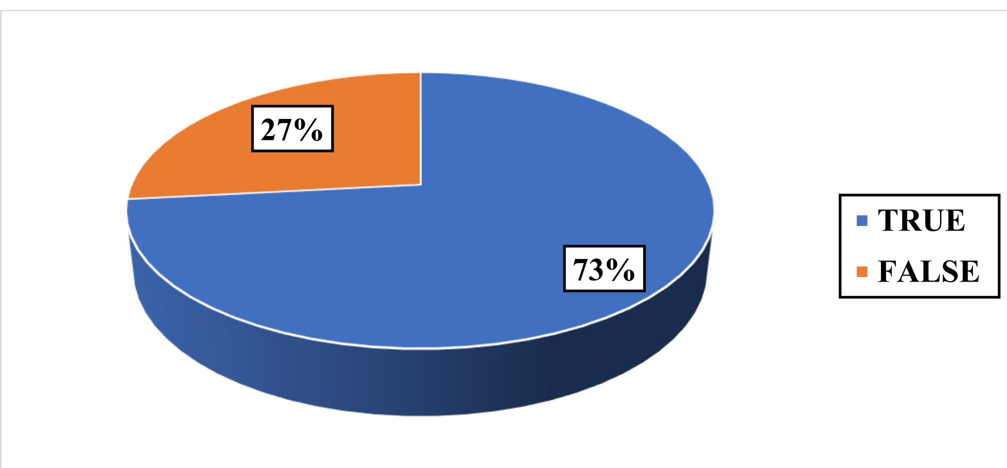

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Figure 2 provides insights into **healthcare professionals' perceptions** regarding the distinguishability between active and latent tuberculosis (TB) cases based on symptoms and diagnostic tests. The majority of respondents, 73%, expressed a belief that it is not possible to differentiate between active and latent TB cases solely through symptoms and diagnostic tests, marking a general scepticism within the healthcare community. Conversely, 27% of respondents acknowledged the possibility of distinguishing between the two based on these criteria.

Table 10: ANOVA for Distinction Between Active and Latent TB Cases

Model	Sum of Squares	df	Mean Square	F	Sig.
1	0.058	2	0.029	0.147	0.864
Residual	28.524	143	0.199		
Total	**28.582**	**145**			

Table 4.23 presents the ANOVA results for a regression model that aimed to assess the healthcare professionals' ability to differentiate between active and latent tuberculosis (TB) cases based on symptoms and diagnostic tests. The outcome is evident, as the model demonstrates no statistical significance ($p = 0.864$), suggesting that the included predictor variables, such as Years of experience in healthcare and Professional role, do not collectively account for a significant proportion of the variance in the dependent variable.

Table 11: Coefficients for Distinction Between Active and Latent TB Cases

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B
Constant	1.278		10.359	0.000	1.034 - 1.522
Professional role.	0.009	0.016	0.187	0.852	-0.081 - 0.098
Years of experience	-0.016	-0.044	-0.521	0.603	-0.076 - 0.044

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in healthcare.					

Table 4.24 provides detailed information on the coefficients resulting from the regression model aimed at understanding the factors influencing healthcare professionals' capability to differentiate between active and latent tuberculosis (TB) cases based on symptoms and diagnostic tests. The unstandardized coefficients for the constant term, Professional role, and Years of experience in healthcare are presented, along with their corresponding standardized coefficients (Beta), t-values, and significance levels. These coefficients offer insights into the relationship between the predictor variables and the ability to distinguish between active and latent TB cases.

In this context, the unstandardized coefficient for the constant term is 1.278, indicating that when all other predictors are at zero, it represents the expected value of the dependent variable. However, the analysis demonstrates that the predictor variables, Professional role (0.009) and Years of experience in healthcare (-0.016), have minimal unstandardized coefficients, reflecting limited influence on healthcare professionals' ability to differentiate between active and latent TB cases. These results are further supported by the non-significant t-values (Professional role: 0.852, Years of experience in healthcare: 0.603), which suggest that these predictor variables are not statistically significant in explaining the ability to distinguish between active and latent TB cases.

Figure 4. 1: Healthcare Professionals' Agreement with TB Screening Responsibility

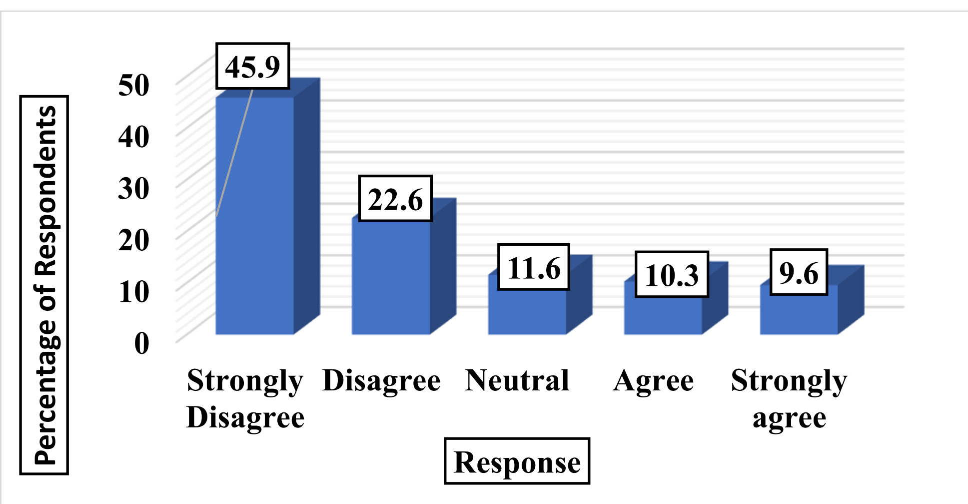

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Figure 4.6 illustrates healthcare professionals' responses to the statement, "TB screening is the duty of all clinical staff and the public health team in the hospital." The majority of respondents express concerns regarding the shared responsibility of TB screening, with 45.9% strongly disagreeing and 22.6% disagreeing. Additionally, 10.3% are neutral, 10.3% agree, and 9.6% strongly agree with the notion that TB screening should be a collective duty.

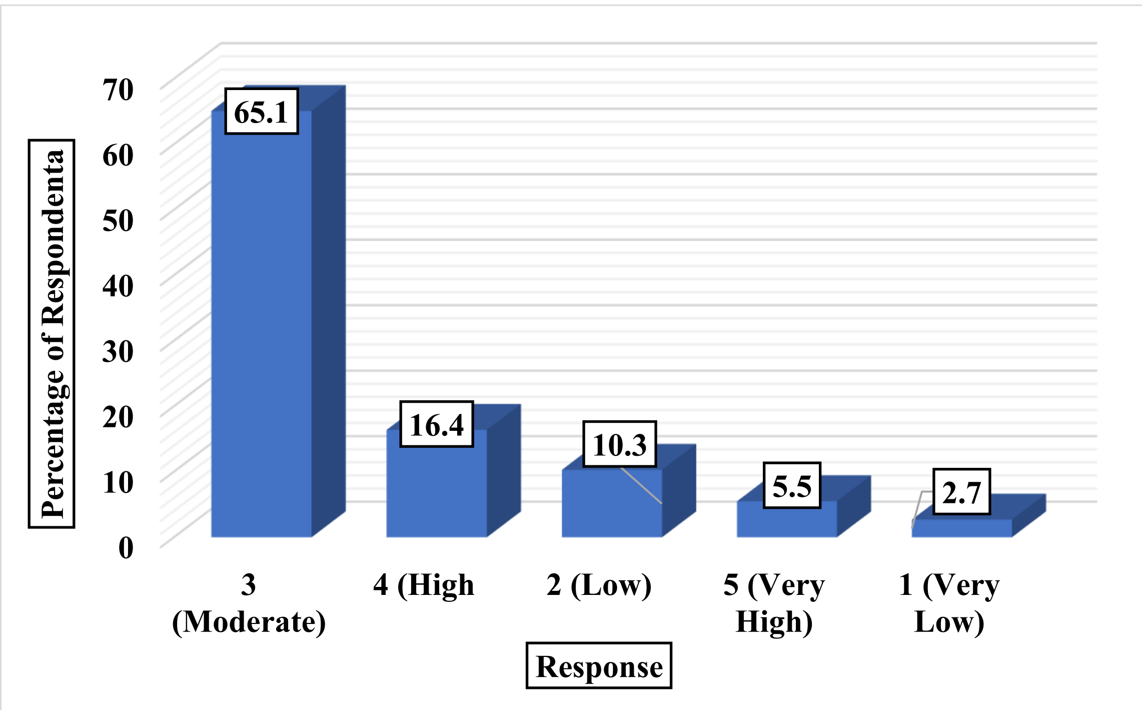

Figure 4.2: Confidence and Knowledge Ratings in TB Case Detection and Management

In Figure 4.7, healthcare professionals rate their confidence and knowledge levels in TB case detection and management on a scale from 1 (very low) to 5 (very high). The data demonstrates that a significant proportion of respondents, 65.1%, perceive their confidence and knowledge as moderate, indicating a reasonable level of competency. Furthermore, 16.4% report high confidence and knowledge, reflecting a considerable level of expertise. Conversely, a smaller proportion, 10.3%, considers their confidence and

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knowledge to be low, while 5.5% express very high confidence and knowledge. Only 2.7% indicate very low confidence and knowledge levels.

4.2.4 Clients Related Factors Influencing Low TB Case Detection

The section presents analysis of results related to clients related factors affecting T B case detection.

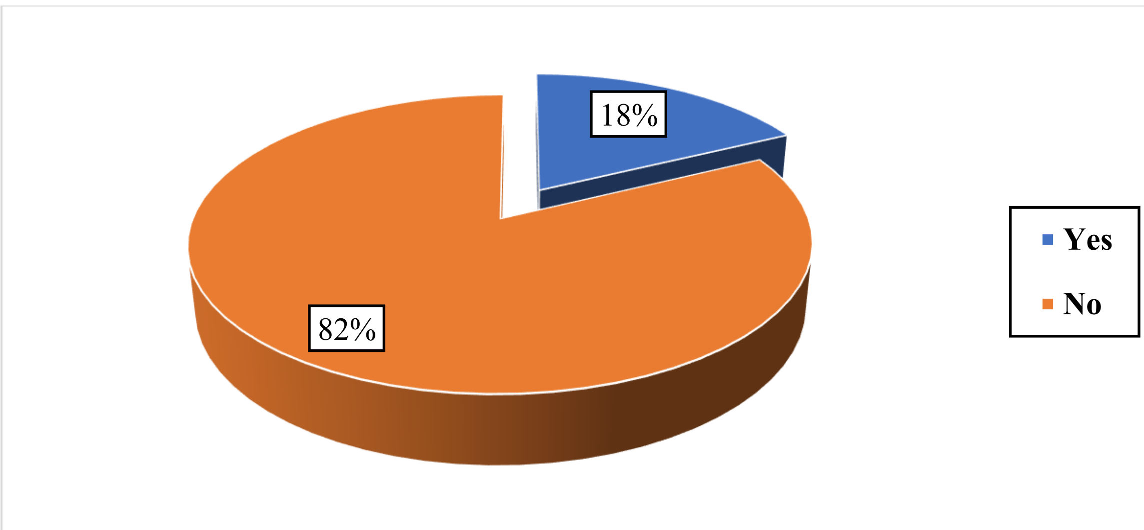

Figure 4.3: Whether Clients Have You Been Tested for TB In the Past Year

(Source: Field data, 2023)

In Figure 4.8, the data illustrates whether clients have been tested for TB in the past year. The figure shows that the majority, constituting 82%, reported that they have not undergone TB testing in the past year, while the remaining 18% indicated that they have indeed been tested.

Table 12: Chi-Square Test Results for TB Testing and selected Demographic Factors

Variable	Chi-Square (χ^2)	Asymp. Sign.
Gender * TB Testing	9.585	**0.002**

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Age * TB Testing	28.758	**0.000**
Level of Education * TB Testing	3.551	0.314

Source: (Field data, 2023)

Table 12 presents the results of chi-square tests examining the associations between TB testing within the past year and demographic factors: Gender, Age, and Level of Education. A significant association was found between Gender and TB Testing (χ^2 = 9.585, p = 0.002), indicating differences in testing behaviour between genders. Age was highly significantly associated with TB Testing (χ^2 = 28.758, p < 0.001), suggesting age-related variations in testing tendencies. In contrast, the Level of Education did not exhibit a significant association with TB Testing (χ^2 = 3.551, p = 0.314)

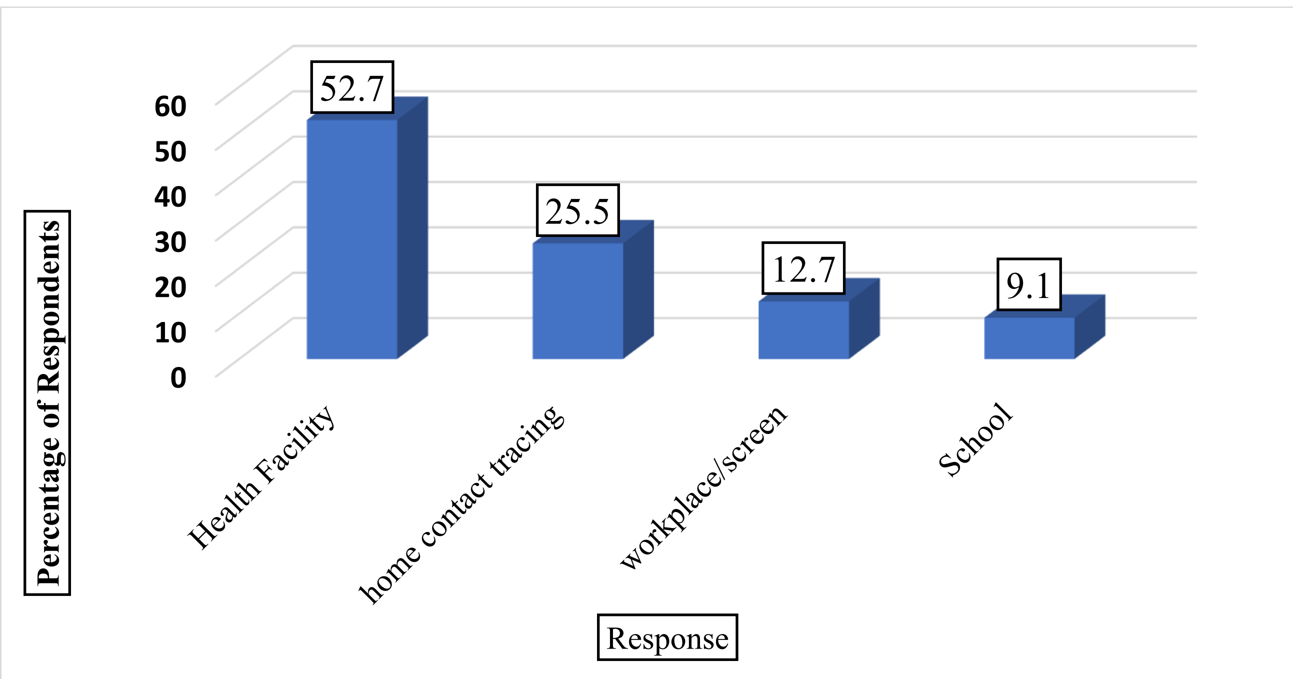

Figure 4.4: Place Respondents were tested for TB

Source: (Field data, 2023)

Figure 4.9 provides insight into the locations where respondents were tested for TB. The majority of respondents, 52.7%, reported being tested for TB in a health facility, indicating that healthcare institutions play a central role in TB testing. Additionally, 25.5% mentioned home contact tracing, highlighting the significance of community-based

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testing efforts. Workplace screening and school testing contributed to 12.7% and 9.1%, respectively.

Table 13: Chi-Square Test Results for Known TB Risk Factors and Familiarity with TB Symptoms

Chi-Square Test	Value	Asymp. Significance (2-sided)
Pearson Chi-Square	31.414	0.012
Likelihood Ratio	34.010	0.005
Linear-by-Linear Association	14.118	0.000
N of Valid Cases	315	

Source: (Field data, 2023)

Table 13 presents the chi-square test results examining the relationship between known TB risk factors and respondents' familiarity with TB symptoms. The p-values associated with the Pearson Chi-Square ($p = 0.012$) and Likelihood Ratio ($p = 0.005$) tests both indicate statistically significant associations. Additionally, the Linear-by-Linear Association test ($p < 0.001$) further confirms this significant association, suggesting that individuals with specific risk factors for TB exposure are more likely to be familiar with TB symptoms.

Table 14: Symmetric Measures for Known TB Risk Factors and Familiarity with TB Symptoms

Symmetric Measures	***Value***	***Asymptotic Standard Error***	***Approximate Significance***
Nominal by Nominal (Contingency Coefficient)	*0.302*		*0.012*
Interval by Interval (Pearson's R)	*-0.213*	*0.054*	

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Ordinal by Ordinal (Spearman Correlation)	*-0.215*	*0.054*	
N of Valid Cases	*315*		

Source: (Field data, 2023)

Table 14 provides the symmetric measures associated with the relationship between known TB risk factors and respondents' familiarity with TB symptoms. The Contingency Coefficient (0.302) suggests a moderate level of association, further supported by the Pearson's R (-0.213) and Spearman Correlation (-0.215) values, both indicating a negative correlation. These results imply that as individuals exhibit more known TB risk factors, their familiarity with TB symptoms tends to decrease. The p-value of 0.012 for the Contingency Coefficient indicates statistical significance, reinforcing the observed association.

Table 15: Statements Related to Clients' Factors Affecting Low TB Case Detection

Statements		**Mean**		
	N	**($\bar{x}$)**	**SE**	**SD**
I am familiar with tuberculosis (TB) and its symptoms	315	2.920	0.091	1.617
I have received education or information about TB.	315	2.900	0.091	1.615
Economic constraints have delayed my access to healthcare services	315	3.840	0.072	1.276
I or someone I know has considered traditional healers or alternative remedies for health issues.	315	2.770	0.078	1.386
I am aware of stigma associated with TB in my community	315	3.530	0.071	1.265
TB-related stigma strongly deters individuals seeking healthcare for TB symptoms.	315	3.430	0.074	1.320
Traditional healers should collaborate with biomedical health facilities for TB case detection and treatment.	315	3.770	0.078	1.381
Health care accessibility can affect TB case detection.	315	3.940	0.074	1.310
Grand Mean		**3.388**		**1.896**

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Note: $\tilde{x}$=mean (Standard mean = 2.50). Mean <2.50 = disagreed; Mean >2.50 agreed

Table 15 presents responses to a set of statements related to clients' perceptions of factors influencing low TB case detection. The respondents, totalling 315, provided feedback on these statements, with "$\tilde{x}$" (mean) values ranging from 2.770 to 3.940. These means, along with their corresponding standard errors (SE) and standard deviations (SD), reveal several key insights into their attitudes and beliefs. Respondents express moderate familiarity with TB and its symptoms (mean 2.920, SE 0.091), and a similar level of education or information about TB (mean 2.900, SE 0.091). Economic constraints delaying healthcare access are acknowledged, with a relatively high mean of 3.840 (SE 0.072), implying awareness of financial barriers in healthcare. Traditional healing practices, with a mean of 2.770 (SE 0.078), are considered by respondents or people they know. Additionally, respondents demonstrate a moderate awareness of stigma associated with TB in their community (mean 3.530, SE 0.071) and believe that such stigma deters individuals from seeking healthcare for TB symptoms (mean 3.430, SE 0.074). They generally agree that traditional healers should collaborate with biomedical facilities for TB case detection and treatment (mean 3.770, SE 0.078) and that health care accessibility plays a role in TB case detection (mean 3.940, SE 0.074). The grand mean of 3.388 (SD 1.896) reflects a moderate overall level of agreement with these factors affecting TB case detection among the respondents.

Table 16: Regression Coefficients for factors that influence client's choice of care and Demographic characteristics

Model	Unstandardized Coefficients (B)	Standardized Coefficients (Beta)	Std. Error	t	Sig.
1	(Constant)	-	4.003	7.368	.000
	Gender	-0.108	-0.040	0.176	-0.616
	Marital Status	0.053	0.029	0.115	0.458
	Age	0.073	0.074	0.061	1.190
	Religious Affiliation	-0.050	-0.022	0.142	-0.349

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	Level of Education	-0.138	-0.110	0.080	-1.740
	Employment Status	-0.327	-0.188	0.112	-2.923

Dependent Variable: Factors that influenced the choice of care

Source: (Field Data, 2023)

Table 16 provides regression coefficients for factors influencing a client's choice of care in the context of demographic characteristics. The "Unstandardized Coefficients (B)" section displays the coefficients associated with each predictor variable. The "Standardized Coefficients (Beta)" represent the standardized influence of each variable. The results show that the constant term has a significant positive effect on the choice of care, with a coefficient of 4.003 and a high t-value of 7.368 (p < .001). Among the demographic variables, age exhibits a positive and statistically significant influence (Beta = 0.074, t = 1.190, p = 0.235), indicating that older individuals are more likely to make certain care choices. Employment status demonstrates a significant negative effect (Beta = -0.188, t = -2.923, p = 0.004), suggesting that being employed has a negative impact on care selection. Gender, marital status, religious affiliation, and level of education do not exhibit statistically significant relationships with the choice of care.

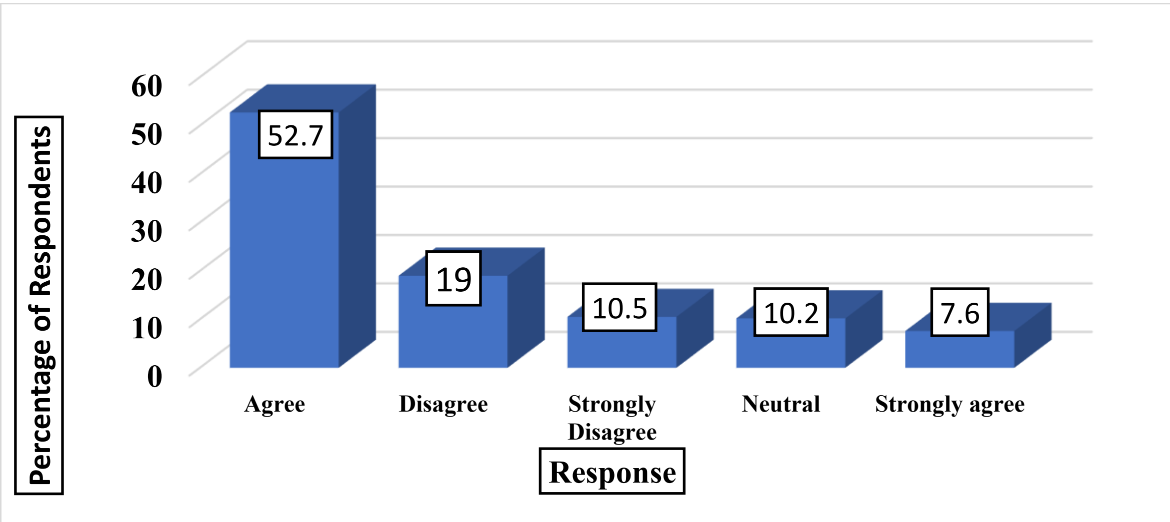

Figure 4.5: Whether Respondents or Someone Has Sought Treatment from An Alternative Source for Health Issues

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Source: (Field Data, 2023)

The data from Figure 4.10 illustrates a range of attitudes among respondents regarding the pursuit of treatment from traditional healers or alternative sources for health issues. A majority of respondents, 52.7%, expressed agreement or openness to these alternative forms of treatment, while 19% disagreed, 10.2% strongly disagreed, and 7.6% strongly agreed with seeking alternative treatments. Additionally, 10.2% of respondents remained neutral in their stance

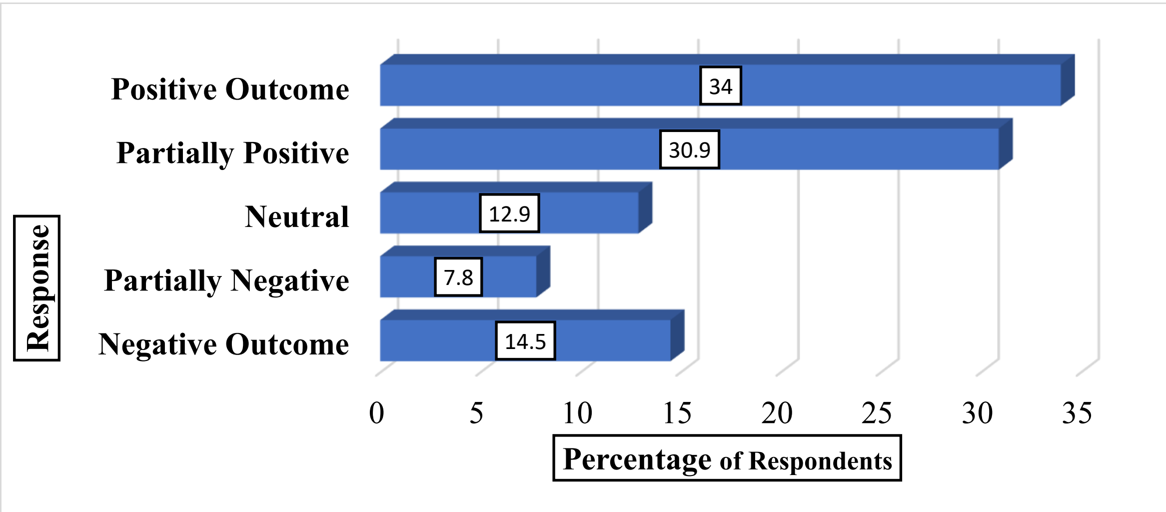

Figure 4.6: The Outcome of Alternative Treatment

(Source: Field Data, 2023)

Figure 4.11 presents diverse perceptions of the outcomes of alternative treatments. A considerable 34% reported positive results, while 30.9% reported partially positive outcomes, suggesting some benefit but not complete satisfaction. In contrast, 7.8% experienced partially negative results, and 14.5% encountered negative outcomes, signifying varying degrees of dissatisfaction. Furthermore, 12.9% remained neutral, implying an absence of clear judgment regarding treatment effectiveness.

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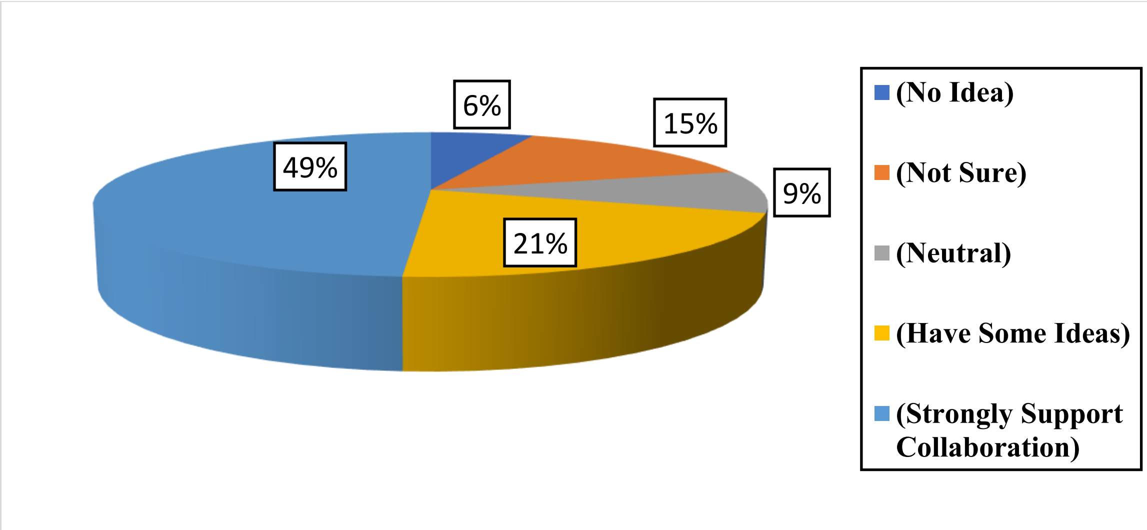

Figure 4. 7:Collaboration Between Traditional Healers and Biomedical Health Facilities

Figure 4.12 presents respondents' attitudes towards promoting collaboration between traditional healers and biomedical health facilities. The data shows that 49% of the respondents strongly support this collaboration. Additionally, 21% of respondents expressed having some ideas about this collaboration. However, a notable 15% of respondents were unsure about this collaboration. Furthermore, 9% remained neutral, and 6% had no idea.

Discussions

This study examined factors influencing tuberculosis (TB) case detection among 146 healthcare workers in the Wassa Amenfi West Municipal area, focusing on how demographic, professional, and educational characteristics shape knowledge, attitudes, and practices. The workforce is diverse in gender, age, education, and professional role, with nurses being the most prevalent group and most participants having 1-5 years of experience. This diversity suggests the need for tailored training and support to enhance confidence and competence in TB case detection.

A majority of health workers (61%) correctly identified bacteria as the cause of TB, but 31% mistakenly attributed TB to a virus, indicating a significant knowledge gap that could hinder early recognition and diagnosis. This finding aligns with Main et al. (2022), who found significant gaps in healthcare workers' knowledge about TB infection, progression, prevention, and treatment. Addressing such gaps through targeted

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training is essential for improving TB case detection and patient care [9].

Most health workers (88.4%) correctly identified airborne transmission as the primary route, which is crucial for effective case detection. However, a minority held misconceptions about transmission via skin contact, sexual contact, or food and water. These misconceptions, though less common, are significant given the role healthcare professionals play in TB detection and management. Targeted educational programs are needed to ensure all workers have accurate, evidence-based knowledge for TB case detection and management.

Analysis of years of experience and ability to identify TB symptoms revealed that a cough lasting more than two weeks-a key TB symptom-was most frequently identified by workers with 1-5 and 11-15 years of experience, while those with 6-10 or 16-20 years reported no cases. Chest and joint pain were mainly reported by those with 1-5 years of experience. Other symptoms like weight loss, night sweats, and fever were identified across all experience categories. Statistically significant associations were found between years of experience and ability to recognize TB symptoms (Pearson Chi-Square and Likelihood Ratio $p = 0.001$), though the relationship was not linear (Linear-by-Linear Association $p = 0.370$). These results highlight the importance of tailored training for different experience levels to improve TB case detection.

Education level also played a crucial role. A significant association was found between education level and ability to recognize TB symptoms (Chi-Square = 39.431, $p = .002$). Higher education correlated with better recognition, underscoring the need for educational interventions that consider varying education levels. This finding aligns with studies by [9], [10], and [11], which show that knowledge gaps among healthcare workers affect their understanding of TB etiology, symptoms, transmission, and treatment.

Regarding TB screening and case detection training, 58% of respondents reported having received training, 34% had not, and 8% were uncertain. "Basic TB awareness" was the most common training type (38.1%), but 16.6% had not received any listed training, indicating areas where further education is needed. Other training types, such as "TB infection control," "TB screening techniques," and "TB diagnostic methods," were less common. These findings highlight the need for comprehensive training strategies to ensure all healthcare professionals are equipped to manage TB cases effectively.

ANOVA for the TB screening training model (professional role, education,

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years of experience) yielded a p-value of 0.150, suggesting these factors do not significantly predict receipt of TB training. This underscores the complexity of factors influencing training participation and the need for more detailed investigations into what drives TB training uptake [12,13 and 14].

Notably, with each additional year of experience, the likelihood of receiving TB training decreased (coefficient -0.098, p = 0.027). Education level and professional role did not significantly affect training uptake. This unexpected pattern suggests a need for strategies that ensure ongoing training for all staff, regardless of experience.

The regression model examining views on latent TB infection (LTBI) transmission was significant (p = 0.000), with gender (males positive) and age (negative) as significant predictors, while years of experience and education were not. This highlights the need for interventions that consider demographic and professional characteristics to improve understanding of LTBI transmission. This finding contrasts with Main et al. (2022), who found that higher TB knowledge was associated with medical occupation or university degree. Studies from Indonesia and Brazil also highlight persistent knowledge gaps and confusion about active versus latent TB among healthcare workers [9,15, and 16]

On preventive measures for LTBI, about 38.4% and 35% of health workers highlighted the importance of isolating individuals with latent TB and administering antibiotics, while 18.5% emphasized symptom monitoring. This diversity in opinion underscores the need for unified educational initiatives to foster a consistent approach to TB prevention.

The study also examined knowledge about clients' eligibility for sputum examination. ANOVA results (F = 7.835, p = 0.000) showed that professional role had a significant negative impact (t = -4.663, Beta = -0.365), suggesting some roles face challenges in identifying eligible clients. Years of experience was not significant, while higher education had a marginal positive effect (p = 0.096). These findings suggest that targeted training for specific roles and educational backgrounds could improve sputum examination practices.

Years of experience also influenced sample collection preferences. Those with 1-5 years of experience preferred sputum samples, while those with 6-10 years or over 21 years of experience rarely chose sputum. Education level also mattered: those with a Bachelor's degree preferred sputum samples, while those with a Master's or other qualifications preferred fewer or none. Nurses primarily collected sputum, physicians focused on blood, and lab technicians

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contributed to sputum collection. These patterns highlight the need for role- and education-specific training [13 and 14].

Diagnostic practices were diverse. Sputum analysis using GeneXpert detected 31.5% of TB cases, microscopy (AFB) 33.6%, chest X-rays 17.1%, and culture/drug sensitivity tests 13.7%. CT scans and full blood count tests were less common. Health workers relied almost equally on bacteriological diagnosis (49.3%) and clinical diagnosis (48.6%), with a small proportion (2.1%) relying on clinical judgment. This diversity underscores the need for a multifaceted diagnostic strategy.

Confidence in identifying high-risk groups for TB transmission varied: 48.6% reported high confidence, 32.2% somewhat confident, and 18.5% less confident. The regression model (R^2 = 0.138, F = 4.473, $p < 0.001$) showed that professional role was positively associated with confidence, while more years of experience were linked to reduced confidence. Education and gender were not significant. These findings suggest interventions should target specific professional roles and address the paradoxical decrease in confidence with experience. Literature supports the link between professional roles, experience, and confidence in TB risk identification [17 and 18]

The ability to differentiate between active and latent TB based on symptoms and diagnostic tests was not significantly influenced by experience or role (p = 0.864). This suggests other factors, such as training quality or institutional protocols, may be more important.

On the question of responsibility for TB screening, 45.9% strongly disagreed and 22.6% disagreed that TB screening is the duty of all clinical staff and the public health team. This lack of consensus highlights challenges in implementing collective TB screening and the need for interventions to foster collaboration and shared responsibility.

Self-assessed confidence and knowledge in TB case detection and management varied: 65.1% rated themselves as moderate, 16.4% as high, 10.3% as low, 5.5% as very high, and 2.7% as very low. This range suggests a generally competent workforce but highlights the need for targeted support for those with lower confidence [19].

In summary, the findings reflect a complex interplay of individual, professional, and systemic factors influencing TB case detection. Knowledge gaps, training disparities, and attitudinal challenges persist, while systemic barriers like limited diagnostic capacity and inconsistent referral mechanisms further hinder effective case detection. Addressing these challenges

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requires targeted educational and training interventions, improved diagnostic infrastructure, and community engagement. Collaboration, strengthened referral systems, and up-to-date knowledge and skills are essential for improving TB case detection and public health outcomes.

Conclusion

While healthcare workers in Wassa Amenfi West Municipal area have a foundational understanding of TB case detection, significant gaps remain in knowledge, training, and confidence. Professional role, education, and experience influence practices in nuanced ways, and systemic barriers complicate TB control. Addressing these through targeted, role-specific, and experience-sensitive training, improved infrastructure, and a collaborative approach will be essential for better TB case detection and management.

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