

Knowledge, Attitude and Practices towards Tuberculosis, Multidrug-Resistant and Extensively Drug-Resistant Tuberculosis among Faculty and Postgraduate Residents in a Tertiary Care Teaching Hospital: A Cross-Sectional Study

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ABSTRACT

Background: Tuberculosis (TB), particularly multidrug-resistant tuberculosis (MDR-TB) and extensively drug-resistant tuberculosis (XDR-TB), remains an important occupational and public health concern among healthcare professionals. Adequate knowledge, favourable attitudes, and appropriate infection-control practices are essential for reducing transmission within healthcare settings. The present study assessed the knowledge, attitude, and practices (KAP) of faculty members and postgraduate residents regarding TB and drug-resistant TB.

Methods: A cross-sectional, questionnaire-based study was conducted among 108 healthcare professionals, comprising 54 faculty members and 54 postgraduate residents. Participants completed a structured questionnaire assessing sociodemographic and professional characteristics, knowledge regarding TB and MDR/XDR-TB, attitudes towards TB, and self-reported infection-control practices. Descriptive statistics were used to summarize the findings, while comparisons between faculty members and postgraduate residents were performed using appropriate statistical tests. A p-value <0.05 was considered statistically significant.

Results: The mean age of participants was 33.9 ± 7.9 years, with males comprising 56.5%. Previous formal TB-related training was reported by 66.7% of participants. Overall, 72.2% demonstrated good knowledge, 78.7% demonstrated a positive attitude, and 63.9% demonstrated good infection-control practices. Faculty members had higher proportions of good knowledge than postgraduate residents (79.6% vs. 64.8%) and good practices (70.4% vs. 57.4%), although the differences were not statistically significant ($p=0.095$ and $p=0.160$, respectively). A positive attitude was observed in 83.3% of faculty members and 74.1% of postgraduate residents ($p=0.252$). Knowledge was strongest regarding TB transmission and basic disease concepts, whereas gaps were observed in revised pre-XDR/XDR-TB definitions and treatment-related aspects.

Conclusion: Participants demonstrated generally good knowledge and favourable attitudes towards TB, but infection-control practices and specific MDR/XDR-TB knowledge require further strengthening. Regular training, CME programmes, and improved institutional infection-control measures may help translate knowledge and positive attitudes into consistent preventive practices.

Keywords: Tuberculosis; MDR-TB; XDR-TB; Knowledge; Infection Control.

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I. INTRODUCTION

Tuberculosis (TB) remains one of the most important communicable diseases worldwide and continues to pose a major public health challenge despite the availability of effective diagnostic and therapeutic interventions. It is caused by *Mycobacterium tuberculosis* and primarily affects the lungs, although extrapulmonary involvement can occur. According to the World Health Organization (WHO) Global Tuberculosis Report 2025, an estimated 10.7 million people developed TB and approximately 1.23 million died from the disease globally in 2024. India continues to contribute a substantial proportion of the global TB burden, making effective prevention, early diagnosis, appropriate treatment and infection-control practices particularly important in the Indian healthcare setting [1]. Although India has made considerable progress in reducing TB

incidence, the persistence of transmission, delayed diagnosis, treatment interruption and emergence of drug-resistant strains remain important barriers to achieving TB elimination [2].

Drug-resistant TB represents a major challenge because resistance limits the effectiveness of conventional anti-tubercular treatment and may result in prolonged treatment, increased adverse effects, higher healthcare costs and poorer outcomes. Multidrug-resistant tuberculosis (MDR-TB) is characterized by resistance to at least rifampicin and isoniazid, the two most important first-line anti-tubercular drugs. The WHO subsequently introduced revised terminology for drug-resistant TB, including pre-XDR-TB and XDR-TB, to reflect resistance to important second-line and Group A drugs. Under the current WHO definition, XDR-TB refers to MDR/RR-TB with additional resistance to any fluoroquinolone and at least one additional Group A drug, namely bedaquiline or linezolid [2]. Awareness of these updated definitions is essential because incorrect understanding may influence diagnostic interpretation, treatment decisions and counselling of patients.

Healthcare professionals are particularly important in the control of TB because they are involved in the identification, diagnosis, treatment, counselling and follow-up of patients. Doctors working in tertiary-care hospitals may encounter patients with undiagnosed, complicated and drug-resistant TB and therefore have a potential occupational risk of exposure. Appropriate knowledge of the modes of transmission, clinical manifestations, diagnostic methods, drug resistance, treatment principles and infection-control measures is essential for minimizing transmission within healthcare facilities. Previous studies among healthcare professionals have demonstrated that although general awareness of TB may be satisfactory, important gaps may persist regarding MDR/XDR-TB, diagnostic approaches, treatment duration and infection-control practices [3,4].

Medical faculty and postgraduate residents have an additional responsibility because they not only provide direct patient care but also supervise and train junior doctors and other healthcare personnel. Their knowledge and attitudes can therefore influence clinical practices within the institution and may subsequently affect the knowledge and behaviour of students and trainees. A study among medical interns in Nepal demonstrated variability in knowledge and practices related to TB, highlighting the need for continuous education and reinforcement of infection-control principles [5]. Similarly, studies among healthcare workers have reported deficiencies in knowledge and implementation of TB infection-control measures, emphasizing the importance of regular training and institutional policies [6,7].

TB infection control requires a combination of administrative, environmental and personal protective measures. Early identification and separation of presumptive TB patients, appropriate respiratory hygiene, adequate ventilation, prioritization of coughing patients and use of suitable respiratory protection are important components of preventing healthcare-associated transmission. Studies from tertiary-care hospitals have reported gaps between awareness and actual infection-control practices among healthcare workers [7,8]. The FAST approach, which emphasizes rapid identification, separation and treatment of infectious TB patients, further highlights the importance of administrative measures in reducing transmission within healthcare facilities [9].

In this context, assessment of knowledge, attitude and practices among faculty and postgraduate residents is important for identifying existing gaps in understanding and implementation of TB and MDR/XDR-TB control measures. The present study therefore aims to assess their knowledge regarding TB and drug-resistant TB, evaluate their attitudes towards affected patients and occupational risk, and document their self-reported infection-control practices in a tertiary-care teaching hospital. The study findings may help identify areas requiring focused educational interventions, periodic sensitization programmes, improved infection-control practices and reinforcement of current national and WHO recommendations. Such interventions may ultimately improve healthcare-worker safety, reduce nosocomial transmission and contribute to strengthening TB control and elimination efforts.

II. MATERIALS AND METHODS

2.1. Study Design

The study was conducted as a **cross-sectional, questionnaire-based observational study** to assess the knowledge, attitude, and practices (KAP) regarding tuberculosis (TB), multidrug-resistant tuberculosis (MDR-TB), and extensively drug-resistant tuberculosis (XDR-TB) among faculty members and postgraduate residents. The study also assessed their self-reported TB infection-control practices. The study design enabled assessment of the existing level of awareness, attitudes, and routine practices of healthcare professionals at a defined point during the study period without introducing any intervention.

2.2. Study Setting

The study was conducted in **Sapthagiri Institute of Medical Sciences and Research Centre (SIMS & RC), Bengaluru**, a tertiary-care teaching hospital. The institution provided clinical services across various departments and served as a teaching and training centre for postgraduate residents and undergraduate medical students. Faculty members and postgraduate residents involved in clinical care were selected as the study

population because of their direct involvement in diagnosis, treatment, counselling, and infection-control practices related to tuberculosis.

2.3. Study Duration

The study was conducted over a period of approximately three months, from **10 May 2026 to 10 August 2026**. During this period, eligible participants were approached, informed about the study, and invited to complete the study questionnaire.

2.4. Participants

The study participants comprised faculty members and postgraduate residents affiliated with SIMS & RC. Faculty included Professors, Associate Professors, Assistant Professors, and Senior Residents, while postgraduate residents from clinical departments, including medicine and allied specialties, were considered for participation. The study population described in the submitted protocol consisted of faculty and postgraduate residents.

Inclusion Criteria

- Faculty members of SIMS & RC willing to participate.
- Postgraduate residents of eligible clinical departments willing to participate.
- Participants who provided informed consent.
- Participants who were available during the study period.

Exclusion Criteria

- Faculty and postgraduate residents from the **Department of Pulmonology**.
- Nursing staff.
- Interns.
- MBBS students.
- Individuals unwilling to participate or not providing informed consent.

The exclusion of Pulmonology faculty and postgraduate residents was considered appropriate because of their greater likelihood of specialized exposure to TB-related teaching and clinical management.

2.5. Study Sampling

Eligible participants who were available during the study period were invited to participate in the study. Participation was voluntary, and consenting faculty members and postgraduate residents were included. The questionnaire was distributed electronically through **Google Forms**, allowing participants to complete the survey conveniently while maintaining confidentiality. The submitted responses were subsequently compiled for analysis. The source protocol describes the approach as inviting all eligible, consenting faculty and residents present during the study period.

2.6. Study Sample Size

The sample size was calculated using the single-proportion formula based on the methodology of the comparable cross-sectional KAP study by Sharma et al. [3], which assessed knowledge, attitude and practices regarding tuberculosis, MDR-TB and XDR-TB among healthcare professionals. Since a single overall proportion for adequate KAP was not reported, an expected proportion of 50% was considered for maximum sample-size estimation. The formula used was $n = Z^2pq/d^2$, where $Z = 1.96$ for a 95% confidence level, $p = 50\%$, $q = 50\%$, and $d = 10\%$ absolute precision. The minimum calculated sample size was 97 participants. After allowing for approximately 10% non-response or incomplete responses, the final sample size was 108 participants, comprising eligible faculty members and postgraduate residents of the institution. Sharma et al. [3] was selected as the reference study because of its similar cross-sectional, questionnaire-based design among healthcare professionals.

2.7. Study Groups

No formal intervention or treatment groups were used because this was a cross-sectional observational study. For analysis, participants could be compared according to their **professional category**, primarily faculty versus postgraduate residents. Further comparisons could be made according to department, years of professional experience/training, and previous exposure to formal TB training.

2.8. Study Parameters

The study parameters included demographic and professional characteristics such as age, sex, designation, department, years of clinical experience or postgraduate training, and previous formal training

related to TB. Knowledge regarding TB, MDR-TB and XDR-TB was assessed using 19 questions with appropriate response options. Attitude towards TB and drug-resistant TB was assessed using 9 questions, while self-reported infection-control practices were assessed using 10 questions. The practice section included areas such as recognition of presumptive TB, patient triage, mask use, ventilation, prioritization of coughing patients, and patient education.

2.9. Study Procedure

After obtaining ethical approval, eligible participants were informed about the objectives and purpose of the study. Written/online informed consent was obtained before participation. A structured, self-administered questionnaire was used. The questionnaire was adapted from previously published KAP tools and relevant WHO and National TB Elimination Programme (NTEP) guidance. It was revised to incorporate the contemporary definitions of MDR-TB, pre-XDR-TB and XDR-TB. The questionnaire was pilot tested for clarity and face validity before final administration. The Google Form contained information regarding the study, voluntary participation, anonymity, and consent before the questionnaire was accessed.

2.10. Study Data Collection

Data were collected through the structured questionnaire during the study period. The first section recorded participant-related demographic and professional information. The subsequent sections assessed knowledge, attitude, and infection-control practices. The questionnaire included questions concerning TB causation, symptoms, transmission, diagnosis, treatment, drug resistance, MDR/XDR-TB, treatment duration, and available diagnostic modalities. Attitude-related questions assessed perceived occupational risk, fear, stigma, willingness for screening and training, and perceptions regarding TB as a public health problem. Practice-related questions assessed routine infection-control measures such as triage, respiratory protection, ventilation, prioritization, and patient counselling.

2.11. Data Analysis

The collected responses were compiled and entered into a Microsoft Excel spreadsheet for analysis. Categorical variables were summarized using **frequencies and percentages**, while continuous variables, wherever applicable, were expressed using appropriate descriptive measures. Knowledge, attitude, and practice responses were summarized separately. Comparisons between faculty and postgraduate residents and between relevant professional subgroups were performed using appropriate statistical tests, such as the **Chi-square test or Fisher's exact test** for categorical variables and an independent-samples test for continuous variables, depending on the distribution and nature of the data. A **p-value <0.05** was considered statistically significant. The supplied protocol specifies descriptive analysis and comparison between faculty and postgraduate residents and across departments or years of experience.

2.12. Ethical Considerations

The study was conducted after obtaining approval from the **Institutional Ethics Committee of Sathagiri Institute of Medical Sciences and Research Centre, Bengaluru**. Participation was voluntary, and participants were informed about the purpose and procedures of the study before providing informed consent. Participants were informed of their right to withdraw from the study at any stage without providing a reason. No personal identifying information was disclosed in the analysis or reporting of results. Confidentiality and anonymity of questionnaire responses were maintained throughout the study, and the collected information was used exclusively for academic and research purposes.

III. RESULTS

A total of 108 participants were included in the present questionnaire-based study, comprising 54 faculty members and 54 postgraduate residents. The study assessed the sociodemographic and professional characteristics of participants and evaluated their knowledge, attitude, and self-reported infection-control practices regarding tuberculosis (TB), multidrug-resistant tuberculosis (MDR-TB), and extensively drug-resistant tuberculosis (XDR-TB).

Table 1. Sociodemographic and Professional Profile of Study Participants (N = 108)

Variable	Faculty n (%)	PG Residents n (%)	Total n (%)
Sex – Male	31 (57.4)	30 (55.6)	61 (56.5)
Sex – Female	23 (42.6)	24 (44.4)	47 (43.5)
Age, mean $\pm$ SD (years)	39.8 $\pm$ 7.4	28.1 $\pm$ 3.1	33.9 $\pm$ 7.9
Professor	12 (22.2)	–	12 (11.1)
Associate/Assistant Professor	27 (50.0)	–	27 (25.0)
Senior Resident	15 (27.8)	–	15 (13.9)

Junior Resident – PG Year 1	–	19 (35.2)	19 (17.6)
Junior Resident – PG Year 2	–	18 (33.3)	18 (16.7)
Junior Resident – PG Year 3	–	17 (31.5)	17 (15.7)
Pulmonology/Respiratory Medicine	10 (18.5)	8 (14.8)	18 (16.7)
General/Internal Medicine	14 (25.9)	16 (29.6)	30 (27.8)
Other clinical departments	30 (55.6)	30 (55.6)	60 (55.6)
<3 years experience/training	6 (11.1)	37 (68.5)	43 (39.8)
3–5 years	13 (24.1)	17 (31.5)	30 (27.8)
>5 years	35 (64.8)	0 (0.0)	35 (32.4)
Prior formal TB training – Yes	42 (77.8)	30 (55.6)	72 (66.7)
Prior formal TB training – No	12 (22.2)	24 (44.4)	36 (33.3)
History of TB in self – Yes	2 (3.7)	1 (1.9)	3 (2.8)
History of TB in family member – Yes	7 (13.0)	6 (11.1)	13 (12.0)
Ever tested for TB – Yes	29 (53.7)	21 (38.9)	50 (46.3)
BCG vaccinated – Yes	51 (94.4)	50 (92.6)	101 (93.5)

The study included 108 participants, equally divided between faculty members and postgraduate residents. Males constituted 56.5% of the participants and females 43.5%. The mean age was higher among faculty members (39.8 ± 7.4 years) than postgraduate residents (28.1 ± 3.1 years). Previous formal TB-related training was reported by 66.7% of participants. A history of TB was uncommon, while 46.3% reported having undergone TB testing previously. BCG vaccination was reported by 93.5% of participants.

Table 2. Knowledge Regarding Tuberculosis and MDR/XDR-TB Among Study Participants (N = 108)

Knowledge Item	Correct n (%)	Incorrect n (%)	Not sure/Don't know n (%)
Causative organism of TB	106 (98.1)	1 (0.9)	1 (0.9)
Common symptoms of active pulmonary TB	101 (93.5)	4 (3.7)	3 (2.8)
Mode of transmission of TB	104 (96.3)	2 (1.9)	2 (1.9)
Curability of drug-sensitive TB	100 (92.6)	4 (3.7)	4 (3.7)
Standard duration of treatment for drug-sensitive TB	84 (77.8)	12 (11.1)	12 (11.1)
Consequences of irregular/interrupted treatment	102 (94.4)	3 (2.8)	3 (2.8)
Groups at higher risk of TB	94 (87.0)	6 (5.6)	8 (7.4)
Protective value of BCG vaccination	89 (82.4)	8 (7.4)	11 (10.2)
Association between HIV and TB	101 (93.5)	3 (2.8)	4 (3.7)
Preferred initial diagnostic test for TB	91 (84.3)	8 (7.4)	9 (8.3)
Awareness of rapid molecular testing	103 (95.4)	3 (2.8)	2 (1.9)
Difference between TB infection and TB disease	79 (73.1)	12 (11.1)	17 (15.7)
Definition of MDR-TB	96 (88.9)	6 (5.6)	6 (5.6)
Definition of pre-XDR-TB and revised XDR-TB	61 (56.5)	19 (17.6)	28 (25.9)
MDR/XDR-TB as a public health problem	101 (93.5)	3 (2.8)	4 (3.7)
Mechanism/causes of acquiring MDR/XDR-TB	87 (80.6)	9 (8.3)	12 (11.1)
Curability of MDR/XDR-TB	73 (67.6)	13 (12.0)	22 (20.4)
Duration of treatment for MDR/XDR-TB	69 (63.9)	16 (14.8)	23 (21.3)
Diagnostic modalities for MDR/XDR-TB	85 (78.7)	9 (8.3)	14 (13.0)
Role of newer drugs in drug-resistant TB	76 (70.4)	10 (9.3)	22 (20.4)

Overall knowledge regarding basic TB concepts was high. The highest proportion of correct responses was observed for identification of the causative organism (98.1%), mode of transmission (96.3%), awareness of rapid molecular testing (95.4%), and consequences of interrupted treatment (94.4%). Knowledge gaps were more evident regarding the distinction between TB infection and TB disease (73.1%) and particularly the revised definitions of pre-XDR/XDR-TB, for which only 56.5% answered correctly. Knowledge regarding MDR/XDR-TB treatment duration, curability, and newer drugs was also comparatively lower.

Table 3. Attitude Towards Tuberculosis and MDR/XDR-TB Among Study Participants (N = 108)

Attitude Item	Yes n (%)	No n (%)	Not sure n (%)
Perceives personal risk of acquiring TB	82 (75.9)	17 (15.7)	9 (8.3)
Feels afraid/anxious about acquiring TB	54 (50.0)	39 (36.1)	15 (13.9)
Would continue social contact with colleague diagnosed with TB	91 (84.3)	8 (7.4)	9 (8.3)
Would share utensils/personal items with TB-infected family member	72 (66.7)	23 (21.3)	13 (12.0)
Believes TB carries social stigma	88 (81.5)	11 (10.2)	9 (8.3)
Willing to undergo periodic screening for TB	96 (88.9)	5 (4.6)	7 (6.5)
Willing to attend regular TB/MDR-TB training or CME	103 (95.4)	2 (1.9)	3 (2.8)
Perceives TB/MDR/XDR-TB as a major public health threat	101 (93.5)	3 (2.8)	4 (3.7)
Perceives scope for improvement in institutional TB control	94 (87.0)	6 (5.6)	8 (7.4)

The participants demonstrated a generally favourable attitude towards TB prevention and control. A large majority perceived TB/MDR/XDR-TB as an important public health problem (93.5%) and expressed willingness to participate in regular TB-related training or CME programmes (95.4%). Periodic TB screening was supported by 88.9% of participants. Although 84.3% reported willingness to maintain social contact with a colleague diagnosed with TB, 81.5% nevertheless perceived TB as carrying social stigma, indicating that stigma remained an important concern. Most participants (87.0%) also felt that institutional TB infection-control measures could be further improved.

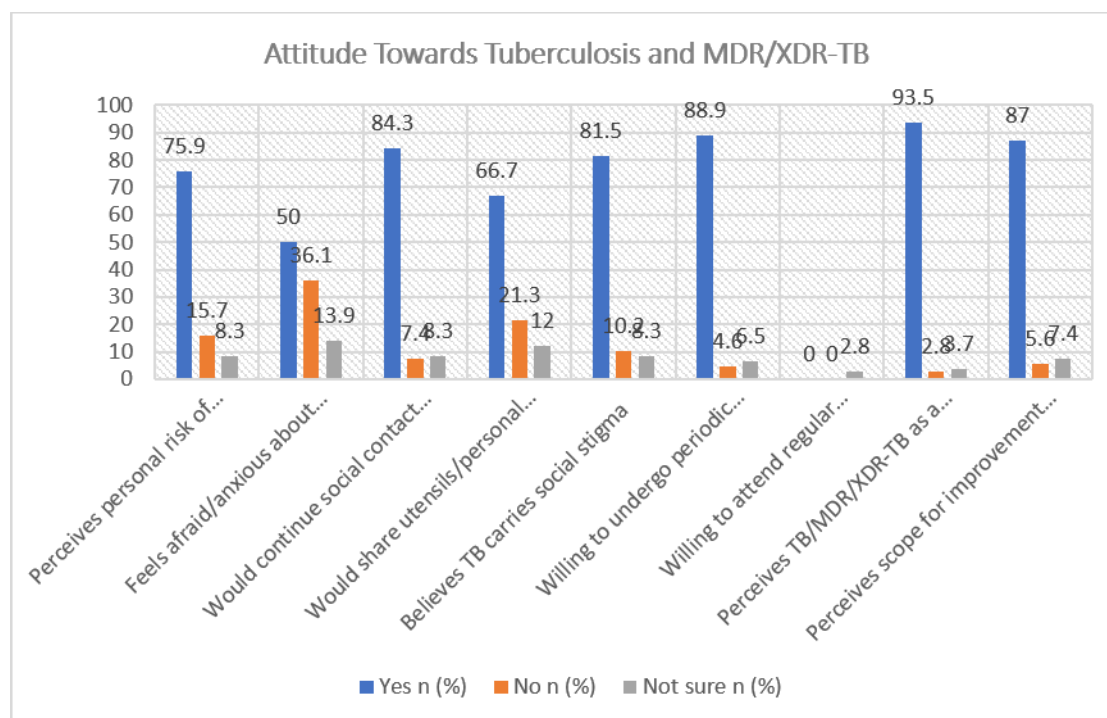


Table 4. Self-Reported TB Infection-Control Practices Among Study Participants (N = 108)

Practice Item	Never n (%)	Sometimes n (%)	Most of the times n (%)	Always n (%)
Suspects TB in patient with cough ≥ 2 weeks	2 (1.9)	8 (7.4)	35 (32.4)	63 (58.3)
Triages/separates coughing or presumptive TB patient	4 (3.7)	13 (12.0)	39 (36.1)	52 (48.1)
Wears N95/respirator while examining coughing patient	5 (4.6)	19 (17.6)	42 (38.9)	42 (38.9)
Wears N95/respirator while managing confirmed DR-TB patient	2 (1.9)	10 (9.3)	34 (31.5)	62 (57.4)
Provides surgical mask to coughing patient	3 (2.8)	12 (11.1)	37 (34.3)	56 (51.9)
Ensures cross-ventilation in rooms housing TB patients	7 (6.5)	17 (15.7)	38 (35.2)	46 (42.6)
Uses exhaust/mechanical ventilation appropriately	13 (12.0)	24 (22.2)	38 (35.2)	33 (30.6)
Prioritises/fast-tracks coughing or presumptive TB patients	5 (4.6)	14 (13.0)	40 (37.0)	49 (45.4)
Counsels newly diagnosed TB patients regarding adherence	2 (1.9)	7 (6.5)	31 (28.7)	68 (63.0)
Educates TB patients regarding cough etiquette/respiratory hygiene	2 (1.9)	8 (7.4)	32 (29.6)	66 (61.1)

Self-reported infection-control practices were generally satisfactory, although variation was observed across individual practices. Regular counselling of TB patients regarding treatment adherence was reported as being performed always by 63.0% of participants, while 61.1% always educated patients regarding cough etiquette and respiratory hygiene. Consistent use of N95/respirators while managing confirmed drug-resistant TB was reported by 57.4%. However, the use of mechanical ventilation was less consistent, with only 30.6% reporting that they always used it appropriately. These findings suggest that although routine clinical and patient-education practices were relatively well established, infrastructure-dependent infection-control measures and consistent respiratory protection could be strengthened.

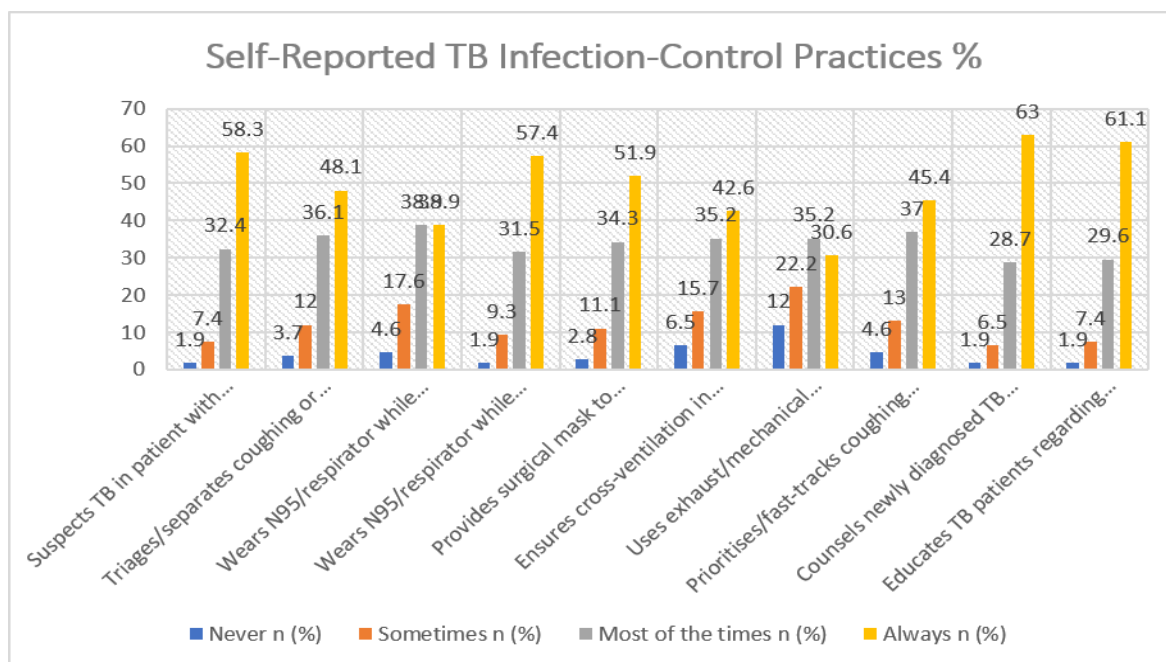


Table 5. Overall Knowledge, Attitude and Practice Categories Among Faculty and Postgraduate Residents (N = 108)

Domain	Category	Faculty n (%)	PG Residents n (%)	Total n (%)
Knowledge	Good	43 (79.6)	35 (64.8)	78 (72.2)
	Moderate	10 (18.5)	16 (29.6)	26 (24.1)
	Poor	1 (1.9)	3 (5.6)	4 (3.7)
Attitude	Positive	45 (83.3)	40 (74.1)	85 (78.7)
	Neutral	8 (14.8)	12 (22.2)	20 (18.5)
	Negative	1 (1.9)	2 (3.7)	3 (2.8)
Practice	Good	38 (70.4)	31 (57.4)	69 (63.9)
	Moderate	14 (25.9)	20 (37.0)	34 (31.5)
	Poor	2 (3.7)	3 (5.6)	5 (4.6)

Overall, 72.2% of participants demonstrated good knowledge, 78.7% demonstrated a positive attitude, and 63.9% demonstrated good self-reported infection-control practices. Faculty members showed a higher proportion of good knowledge (79.6%) and good practices (70.4%) compared with postgraduate residents (64.8% and 57.4%, respectively). A positive attitude was observed in 83.3% of faculty and 74.1% of postgraduate residents.

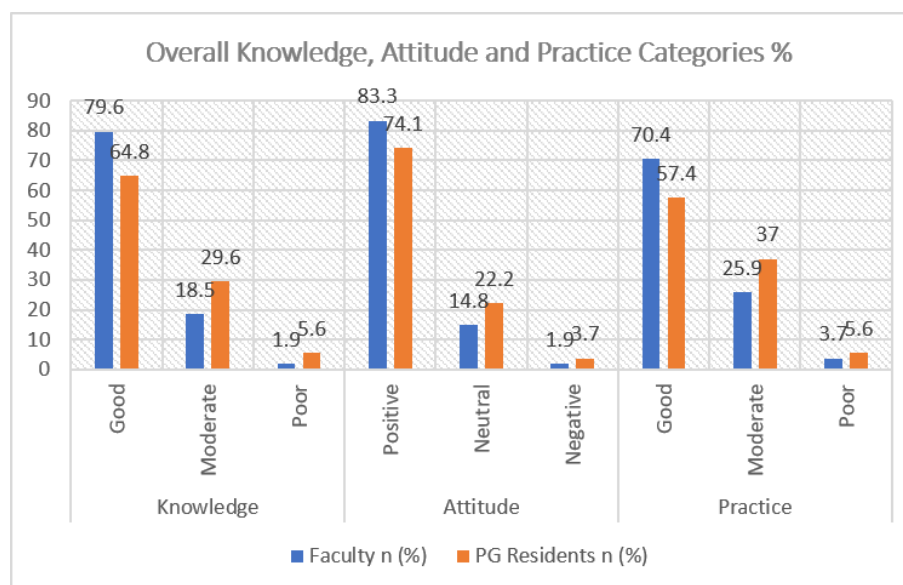
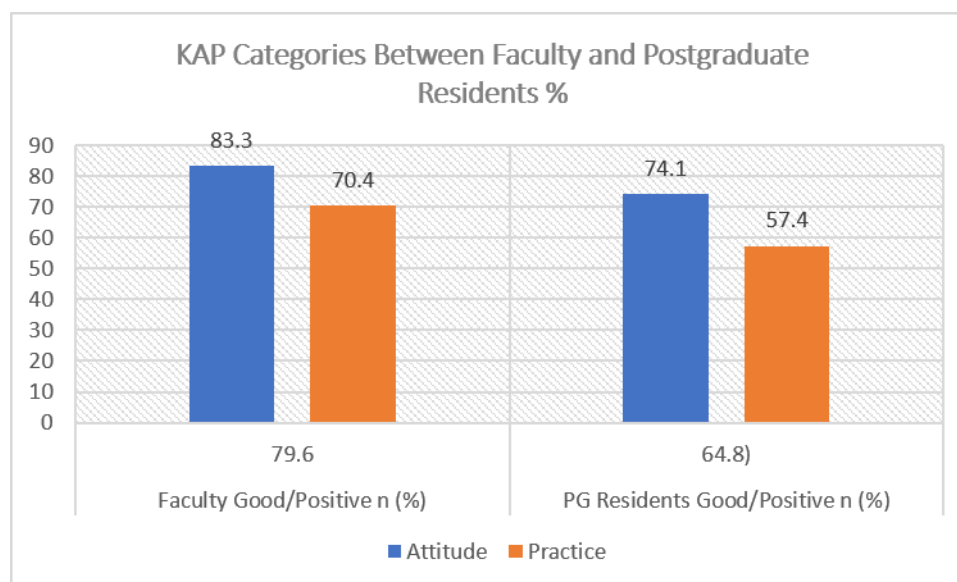


Table 6. Comparison of Knowledge, Attitude and Practice Categories Between Faculty and Postgraduate Residents

Domain	Faculty Good/Positive n (%)	PG Residents Good/Positive n (%)	χ^2	p-value
Knowledge	43 (79.6)	35 (64.8)	2.79	0.095
Attitude	45 (83.3)	40 (74.1)	1.31	0.252
Practice	38 (70.4)	31 (57.4)	1.98	0.160

Faculty members demonstrated higher proportions of good knowledge, positive attitude, and good infection-control practices than postgraduate residents; however, the differences were not statistically significant for knowledge ($p=0.095$), attitude ($p=0.252$), or practice ($p=0.160$).



IV. DISCUSSION

The present study evaluated the knowledge, attitude, and self-reported tuberculosis (TB) infection-control practices among 108 healthcare professionals, comprising 54 faculty members and 54 postgraduate residents. The participants had a mean age of 33.9 ± 7.9 years, with faculty members being older than postgraduate residents (39.8 ± 7.4 vs. 28.1 ± 3.1 years). Males constituted 56.5% and females 43.5% of the study population. Previous formal training related to TB/MDR-TB/XDR-TB was reported by 66.7% of participants, while 33.3% had not received such training. A history of TB was uncommon, with 2.8% reporting previous TB themselves and 12.0% reporting TB in a family member. Nearly half (46.3%) had undergone TB testing previously, while 93.5% reported BCG vaccination. The relatively high proportion with previous formal TB training may have contributed to the generally favourable knowledge and attitude observed in the present study. These findings are broadly comparable with **Sharma et al. [3]**, who conducted a questionnaire-based survey among 423 healthcare professionals and reported overall good knowledge, attitude and practices regarding TB, although awareness concerning MDR/XDR-TB, particularly diagnosis and management, was comparatively lower.

In the present study, knowledge of basic TB concepts was also high: 98.1% correctly identified the causative organism, 96.3% knew the mode of transmission, 93.5% recognised common symptoms, and 95.4% were aware of rapid molecular diagnostic tests. However, specific knowledge gaps were observed in areas related to drug-resistant TB. Only 56.5% correctly identified the revised definitions of pre-XDR/XDR-TB, while 67.6% correctly understood the curability of MDR/XDR-TB and 63.9% knew the duration of MDR/XDR-TB treatment. This pattern closely corresponds with the observations of **Sharma et al. [3]**, who specifically noted comparatively lower awareness regarding MDR/XDR-TB diagnosis and management despite generally good overall TB knowledge. Similarly, **Veeraragavan et al. [14]**, among 113 healthcare professionals, reported that 64.2% demonstrated fair/good knowledge regarding MDR/XDR-TB, while attitudes towards newer drugs were not satisfactory and approximately 51% demonstrated positive perception.

The present study showed a higher proportion with good overall knowledge (72.2%), although the persistence of gaps in specialized MDR/XDR-TB knowledge indicates the continuing need for focused training. In contrast, **Shrestha et al. [10]** reported good DR-TB knowledge in 91 of 95 respondents (95.79%) but appropriate attitude in only 49 (51.58%) and optimal practice in 35 (36.84%), with a significant positive correlation between attitude and practice ($p=0.37$, $p \leq 0.001$). In the present study, 78.7% demonstrated a positive

attitude and 63.9% demonstrated good infection-control practices, suggesting a more favourable overall KAP profile, although direct comparison should be interpreted cautiously because the populations and scoring methods differed.

The favourable attitude observed in the present study was particularly evident in participants' willingness to attend regular TB/MDR-TB training or CME programmes (95.4%), willingness to undergo periodic TB screening (88.9%), and recognition of TB/MDR/XDR-TB as a major public health threat (93.5%). At the same time, 87.0% believed that institutional TB infection-control measures could be improved, suggesting that participants recognised existing gaps despite generally positive attitudes. This finding is consistent with **Sharma et al. [3]**, who reported that the majority of healthcare professionals were open to regular training programmes and TB testing and also felt that there was scope for improvement in TB-control programmes. **Jethani et al. [8]**, in a study of 156 healthcare workers, reported good-to-moderate knowledge and attitude levels of 90.3% and 92.3%, respectively, whereas good-to-moderate infection-control practice was observed in 59.6%. The present study showed a similar pattern, with 72.2% having good knowledge and 63.9% having good practices, reinforcing the observation that appropriate knowledge and attitude do not always translate completely into optimal practice.

This issue was also highlighted by **Alene et al. [12]**, who found that only 39.5% of 377 healthcare workers had good MDR-TB knowledge and only 19.6% had good self-reported practice; postgraduate education and infection-prevention training were associated with better knowledge. In the present study, faculty members had higher proportions of good knowledge (79.6%) and good practices (70.4%) than postgraduate residents (64.8% and 57.4%), although these differences were not statistically significant ($p=0.095$ and $p=0.160$, respectively). Similarly, positive attitude was more frequent among faculty (83.3%) than postgraduate residents (74.1%), but the difference was not significant ($p=0.252$). The practice findings further demonstrated areas requiring attention: only 38.9% reported always wearing an N95/respirator while examining a coughing patient, although 57.4% reported always using respiratory protection while managing confirmed DR-TB. Only 30.6% always used mechanical ventilation appropriately, whereas 63.0% always counselled newly diagnosed patients regarding treatment adherence and 61.1% always educated patients about cough etiquette.

These findings are important because **Harrison et al. [13]**, among 87 final-year medical students, reported that 47.7% experienced difficulty obtaining an N95 respirator when needed, highlighting the importance of institutional availability of respiratory protection. Conversely, **Baral and Koirala [11]** reported poor TB infection-control practices among nurses, with none reporting use of an N95 mask or respirator during care of TB patients. The present findings therefore suggest comparatively better respiratory-protection practices but also demonstrate room for improvement in consistent implementation. **Abbas et al. [15]**, in 517 Lebanese healthcare workers, reported good knowledge in 48.52%, average knowledge in 49.52%, good attitude in only 16.25%, and good practices in 14.7%, demonstrating substantial variability in KAP across healthcare settings.

Overall, the present study indicates that participants possessed generally good knowledge and favourable attitudes toward TB and drug-resistant TB, but specific deficiencies in MDR/XDR-TB definitions, treatment-related knowledge, consistent respiratory protection, and environmental infection-control practices remain. Regular structured training, CME programmes, strengthening of institutional infection-control infrastructure, and periodic assessment of healthcare-worker practices may therefore help translate existing knowledge and positive attitudes into more consistent TB prevention and control practices.

V. CONCLUSION

The present study demonstrated that faculty members and postgraduate residents had an overall good level of knowledge, favourable attitude, and generally satisfactory infection-control practices regarding tuberculosis and drug-resistant TB. Good knowledge was observed in 72.2%, a positive attitude in 78.7%, and good practices in 63.9% of participants. Faculty members showed higher proportions of good knowledge (79.6% vs. 64.8%) and good practices (70.4% vs. 57.4%) than postgraduate residents, although these differences were not statistically significant. Important gaps were identified in knowledge of revised pre-XDR/XDR-TB definitions, treatment duration, respiratory protection, and environmental infection-control practices. Regular CME programmes, focused MDR/XDR-TB training, and strengthening of institutional infection-control measures may help improve and sustain appropriate TB prevention and control practices among healthcare professionals.

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