

Original Article

ATTITUDES AND PRACTICES REGARDING TUBERCULOSIS INFECTION CONTROL AMONG NURSES AT KHYBER TEACHING HOSPITAL, PESHAWAR, PAKISTAN

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ABSTRACT:

This study was a cross-sectional study conducted to assess the attitudes and practices regarding tuberculosis (TB) infection control among nurses working at Khyber Teaching Hospital, Peshawar. The study included 187 registered nurses at Khyber Teaching Hospital, Peshawar. Participants were selected through convenience sampling. Data were collected using a structured, self-administered questionnaire assessing attitudes and practices related to TB infection control. Data were analyzed using SPSS version 22, and results were presented as frequencies and percentages. Majority of participants demonstrated positive attitudes toward TB infection control. Most nurses reported routinely screening patients for cough (79.1%) and ensuring separation of suspected TB cases (77%). A high proportion (89.3%) reported consistent use of personal protective equipment when managing TB patients. Additionally, 88.7% emphasized the importance of proper ventilation in infection control. Regarding practices, 88.8% reported using protective measures, and 85.5% expressed confidence in managing TB patients. However, gaps were identified in specific practices such as sputum collection in well-ventilated areas. Nurses exhibited generally positive attitudes and satisfactory practices regarding TB infection control. However, inconsistencies in certain practices highlight the need for continuous training and reinforcement of infection control guidelines to minimize the risk of TB transmission in healthcare settings.

Keywords: Tuberculosis, Infection Control, Nurses, Attitude, Practices, Pakistan

INTRODUCTION

Tuberculosis (TB) remains one of the leading infectious causes of morbidity and mortality worldwide, particularly in low- and middle-income countries such as Pakistan (1,2). According to the World Health Organization (WHO), Pakistan is among the top 30 high TB burden countries globally, reporting over 400,000 new TB cases annually (3). TB is caused by *Mycobacterium tuberculosis* and is primarily transmitted through airborne droplets expelled when infected individuals cough or sneeze (4). Despite ongoing control efforts, TB continues to pose significant public health challenges, particularly in healthcare facilities where nosocomial transmission is a major concern (5). Healthcare workers, particularly nurses, are at increased risk of exposure due to frequent and prolonged contact with patients. In high-burden countries, risk is compounded by overcrowding, inadequate infection control measures, limited resources, and insufficient occupational training (6,7). Effective tuberculosis infection control (TBIC) measures, including early identification of suspected cases, separation of infectious patients, use of personal protective equipment (PPE), and maintenance of proper ventilation are essential for reducing transmission within healthcare facilities (8,9). Nurses' attitudes and practices significantly influence the successful implementation of TBIC measures. Positive attitudes and adherence to recommended practices can substantially reduce transmission risk, whereas gaps or misconceptions may compromise both patient safety and healthcare worker well-being (10,11). Previous studies report considerable variability in infection control practices among nurses, often affected by training, resource availability, institutional policies, and perceived occupational risk (12–14). In Pakistan, limited evidence exists regarding nurses' attitudes and practices toward TBIC in tertiary care hospitals, despite the country's high TB

burden. Understanding these factors is critical for designing targeted interventions aimed at improving infection control, reducing occupational risk, and ultimately minimizing nosocomial transmission. Therefore, this study aimed to assess the attitudes and practices regarding tuberculosis infection control among nurses at Khyber Teaching Hospital, Peshawar, providing evidence to inform both institutional policies and broader public health strategies.

METHODS

Study Design and Setting: A descriptive cross-sectional study was conducted at Khyber Teaching Hospital (KTH), Peshawar, a tertiary care hospital providing diverse medical, surgical, and infectious disease services (15). Data collection took place over a three-month period, from May to July 2025.

Study Population and Sampling: The study population included registered nurses with a minimum of one year of clinical experience. Student nurses and those with less than one year of experience were excluded. A total of 187 nurses participated, recruited using convenience sampling. This sampling method allowed inclusion of all available nurses during the study period, although it may limit generalizability.

Data Collection Tool and Procedure: Data were collected using a structured, self-administered questionnaire designed based on international TBIC guidelines (CDC 2005, WHO 2019). The questionnaire included three sections: demographic characteristics, attitudes toward TBIC, and routine clinical practices. The tool was pilot-tested on 10 nurses not included in the final sample to ensure clarity, validity, and reliability. Minor modifications were made based on pilot feedback. Questionnaires were distributed in person and collected after completion, ensuring completeness and confidentiality.

Data Analysis: Data were entered and analyzed using Statistical Package for Social Sciences (SPSS version 22). Descriptive statistics, including frequencies and percentages, were calculated for categorical variables. Results were presented in tables for clarity and ease of interpretation.

RESULTS

A total of 187 nurses participated. Demographic characteristics are summarized in Table 1. Most participants were female (72.2%), aged 25–30 years (63.6%), and had 2–5 years of experience (65.2%). The majority held a Bachelor of Science in Nursing with professional qualification (62.6%).

Attitudes toward TB Infection Control: The majority demonstrated proactive attitudes. Routine screening for cough was reported by 79.1%, and 77% ensured separation of symptomatic patients. Patient education was emphasized by 88.8%, instructing patients to cover their mouth when coughing. Ventilation was considered important by 88.7%, and consistent PPE use was reported by 89.3%. Lower adherence was noted for sputum collection in well-ventilated areas (62.5%) (Table 2).

Practices Regarding TB Infection Control: Most nurses expressed comfort caring for TB patients (70.6%) and endorsed equal care for TB patients (68.4%). PPE use was reported by 88.8%, and 85.5% expressed confidence in managing TB patients. Adequate training was reported by 82.3%, though gaps were noted. About 92.5% supported regular TB screening for healthcare workers (Table 3).

DISCUSSION

This study evaluated TBIC attitudes and practices among nurses at KTH, Peshawar. Overall, nurses exhibited positive attitudes and generally good practices, although some inconsistencies were identified.

Routine patient screening and separation of suspected TB cases demonstrate proactive attitudes. These findings align with previous studies emphasizing early identification as a cornerstone for reducing nosocomial TB transmission (16,17). Ventilation was widely recognized, consistent with literature highlighting its role in controlling airborne infections (18). However, lower adherence in sputum collection indicates that knowledge does not always translate into practice, possibly due to workload, infrastructure limitations, or insufficient reinforcement of guidelines (19). High PPE usage aligns with global research, reflecting institutional emphasis on infection prevention and heightened awareness following global infectious disease outbreaks (20,21). Nurses

reported confidence in managing TB patients and commitment to equal care, although stigma perceptions persisted in some cases, suggesting a need for ongoing sensitization (22).

Table 1: Demographic Characteristics of Participants (n = 187)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	52	27.8
Female	135	72.2
Marital Status		
Married	105	56.1
Single	82	43.9
Education		
PRN	117	62.6
BSN	69	36.9
MSN	1	0.5
Age (years)		
20–25	50	26.7
25–30	119	63.6
>30	18	9.6
Experience (years)		
<2	29	15.5
2–5	122	65.2
>5	36	19.3

Table 2: Attitudes Regarding TB Infection Control (n = 187)

Statement	Agree / Strongly Agree n (%)	Neutral n (%)	Disagree / Strongly Disagree n (%)
Routinely ask patients about cough upon entry	148 (79.1)	21 (11.2)	18 (9.7)
Ensure separation of coughing patients	144 (77.0)	26 (13.9)	17 (9.1)
Emphasize importance of proper ventilation in clinical areas	166 (88.7)	14 (7.5)	7 (3.8)
Encourage patients to cover mouth when coughing	166 (88.8)	12 (6.4)	9 (4.8)
Ensure sputum collection in well-ventilated areas	117 (62.5)	38 (20.3)	32 (17.1)
Consistently use PPE when managing TB patients	167 (89.3)	14 (7.5)	6 (3.2)

Training significantly influenced adherence. Although most participants received training, gaps were reported, echoing other studies where irregular or inadequate training was associated with suboptimal infection control practices (23). Continuous professional development and hands-on reinforcement are necessary to ensure sustained compliance. Awareness of occupational risk was high, promoting cautious behavior, but may also contribute to anxiety and stress. Institutional support, including psychological counseling and regular health screening, is crucial to safeguard healthcare worker well-being (24). These findings highlight encouraging TBIC practices among nurses but underscore the need for regular training, infrastructure improvement, and institutional monitoring to address gaps, improve compliance, and minimize nosocomial TB risk.

Limitations: The cross-sectional design represents a single point in time, limiting causal inference. Convenience sampling may affect generalizability. Self-reported practices may be influenced by social desirability bias.

Table 3: Practices Regarding TB Infection Control (n = 187)

Statement	Yes / Agree n (%)	Neutral n (%)	No / Disagree n (%)
Comfortable caring for TB patients	132 (70.6)	31 (16.6)	24 (12.8)
TB patients deserve equal care and compassion	128 (68.4)	39 (20.9)	20 (10.7)
Use of personal protective equipment during patient care	166 (88.8)	14 (7.5)	7 (3.7)
Perceive risk of contracting TB while caring for patients	146 (78.1)	27 (14.4)	14 (7.5)
Confident in managing TB patients effectively	160 (85.5)	18 (9.6)	9 (4.8)
Received adequate TB infection control training	154 (82.3)	22 (11.8)	11 (5.9)
TB patients face stigma from healthcare providers	103 (55.1)	49 (26.2)	35 (18.7)
Support regular TB screening for healthcare workers	173 (92.5)	9 (4.8)	5 (2.7)

CONCLUSION

Nurses at Khyber Teaching Hospital generally exhibit positive attitudes and satisfactory TBIC practices, including patient screening, PPE use, and ventilation maintenance. Gaps in practices, particularly during procedures like sputum collection, require attention. Continuous training, regular monitoring, and institutional reinforcement of infection control protocols are essential to ensure consistent and effective implementation. Future studies should explore compliance determinants and evaluate targeted interventions to further strengthen TBIC practices among healthcare workers.

Conflict of Interest

The authors declare no conflict of interest.

Ethical Consideration

Ethical approval was obtained from the institutional review board, and permission was secured from KTH administration. Written informed consent was obtained from all participants. Participation was voluntary, and confidentiality and anonymity were strictly maintained.

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