

Survey

Knowledge, attitude and practice of nurses regarding pulmonary tuberculosis in a tertiary care hospital

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Abstract

Background: Knowledge, attitude and practices of nurses can have a significant effect on the delivery of health services to pulmonary tuberculosis patients. Information regarding this can help in modifying and improving the training programs for nurses working in various health facilities. **Objectives:** To study the knowledge, attitude and practices of nurses regarding pulmonary tuberculosis in an academic hospital. **Methods:** A cross sectional questionnaire based study was conducted over a period of one month at Kasturba Hospital, Manipal, Karnataka. 202 (89.8%) out of the 225 nurses who were approached agreed to take part in the study and were included in the analysis. The data was analysed using SPSS 16.0., p values were calculated using chi-square test. **Results:** 79 (39.1%) respondents were worried about getting tuberculosis from patients. 37 (63.8%) subjects who had work experience in a tuberculosis ward as compared to 58 (40.3%) who had never worked in a TB ward were able to write the expanded form of DOTS ($p = 0.002$). Only 4.5% of respondents collected sputum in an open area. Regarding the measures taken to reduce transmission of TB infection in the ward it was found that 143 (70.8%) respondents followed the correct practices. It was noted that only 86 (42.6%) subjects displayed satisfactory level of awareness. **Conclusion:** Majority of the respondents were not choosing the right location for sputum collection. With less than fifty per cent of the respondents having satisfactory level of awareness there is a need to further strengthen the training and skill monitoring programs.

Keywords : Tuberculosis, nurses, tertiary care hospital

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Introduction

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*. Pulmonary tuberculosis accounts for more than 85% of all TB cases.¹ In India, healthcare workers, particularly nurses, take care of such patients on a routine basis. The nurses are probably exposed much more to such patients during their duty hours than other healthcare workers. The knowledge, attitude and practice (KAP) of nurses regarding pulmonary tuberculosis can have a profound impact on patient care and the nosocomial spread of the disease. The spectrum of health care facilities that exist in our country, ranging from primary health centres to tertiary care hospitals, nonteaching to teaching and government funded to privately run facilities, create varied work

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environments with different levels of knowledge and practices amongst staff. Hence there is a need to assess the level of functioning of the staff including nurses working in these different work environments. Therefore, this questionnaire based study was conducted to survey the KAP of nurses regarding tuberculosis in one such setting *i.e.* a tertiary care private hospital attached to a medical college. The present study was designed to assess the knowledge of nurses regarding pulmonary tuberculosis and to know about the attitude and practices of nurses regarding pulmonary tuberculosis patients.

Materials and methods

A cross sectional study was conducted over a period of one month at Kasturba Hospital, Manipal, Udipi, Karnataka. It is a tertiary care hospital attached to a medical college and has a Directly Observed Treatment Short course (DOTS) centre functioning in the hospital. The study protocol was approved by the institutional ethics committee of Manipal University, Manipal, Karnataka, India. After taking a written informed consent in the language understandable to them, a questionnaire was distributed among 225 nurses to obtain information on demographic characteristics (such as age, gender, total years of service, work experience in tuberculosis ward and intensive care unit), BCG vaccination status, history of tuberculosis and KAP related questions.

Nurses from various departments including general medicine, pulmonary medicine and surgery were interviewed. All were qualified nurses and permanent employees of the hospital. 202 nurses (89.8%) who agreed to take part in the study were included in the analysis. The data was analysed using SPSS 16, SPSS, Chicago, Illinois and p values were calculated using Chi-square test. The level of statistical significance was set at p value < 0.05.

Results

The mean age of the respondents was 30.05 years. The mean total years of service was 7.38 years. The mean total period of service in tuberculosis ward was 1.1 years. The demographic characteristics of the subjects are shown in *Table 1*.

Table 1: Descriptive and demographic characteristics of the subjects (n = 202)

Variable	n (%)
Gender	
Male	31 (15.3)
Female	171 (84.7)
Age (years)	
20-29	123 (60.9)
30-39	43 (21.3)
40 and above	36 (17.8)
Total duration of service (years)	
≤ 5	114 (56.4)
6-10	30 (14.9)
11-15	21 (10.4)
16-20	26 (12.9)
21 and above	11 (5.4)
Work experience in tuberculosis ward	
Yes	58 (28.7)
No	144 (71.3)
Presently working in Intensive care unit	
Yes	15 (7.4)
No	187 (92.6)
History of BCG vaccination	
Yes	176 (87.1)
No	8 (4.0)
Do not remember	18 (8.9)
History of tuberculosis	
Yes	3 (1.5)
No	199 (98.5)

Responses to the question 'Are you worried about getting tuberculosis from patients?' in relation to demographic factors are shown in *Table 2*. 79 (39.1%) respondents were worried about getting tuberculosis from patients.

Only three subjects, all of whom were females, had suffered from tuberculosis. One of them had pulmonary tuberculosis and the other two had extra pulmonary tuberculosis. All three of them belonged to age group 20-29 years (p value = 0.376) and none of them had worked in a tuberculosis ward (p value = 0.268).

A total of 176 (87.12%) subjects received BCG vaccination and of these only one (0.6%) developed

Table 2: Responses to the question, “Are you worried about getting TB from patients?” in relation to demographic factors (n=202).

Variable	Yes n (%)	No n (%)	Uncertain n (%)	p value
Gender				
Male	16 (51.6)	10 (32.3)	5 (16.1)	0.298
Female	63 (36.8)	74 (43.3)	34 (19.9)	
Age (years)				
20-29	60 (48.8)	41 (33.3)	22 (17.9)	0.004*
30-39	13 (30.2)	20 (46.5)	10 (23.3)	
40 and above	6 (16.7)	23 (63.9)	7 (19.4)	
Total duration of service (years)				
≤ 5	54 (47.4)	40 (35.1)	20 (17.5)	0.012*
6-10	10 (33.3)	15 (50.0)	5 (16.7)	
11-15	10 (47.6)	8 (38.1)	3 (14.3)	
16-20	2 (7.7)	14 (53.8)	10 (38.5)	
21 and above	3 (27.3)	7 (63.3)	1 (9.1)	
Work experience in tuberculosis ward				
Yes	22 (37.9)	24 (41.4)	12 (20.7)	0.946
No	57 (39.6)	60 (41.7)	27 (18.8)	
Work experience in Intensive care unit				
Yes	7 (46.7)	7 (46.7)	1 (6.7)	0.432
No	72 (38.5)	77 (41.2)	38 (20.3)	

*Statistically significant

tuberculosis. Eight subjects clearly denied having been vaccinated and of these one (12.5%) developed the disease (p value =0.008). 18 subjects did not remember whether they had received vaccination and of these one (5.6%) developed tuberculosis.

The percentage of correct responses to knowledge and practice related questions are shown in *Table 3*.

The responses of subjects to questions assessing knowledge related to TB were not influenced by any

Table 3: Correct responses of nurses to questions related to knowledge and practice of pulmonary tuberculosis (n = 202)

Knowledge related questions	Correct answers	Correct responses n (%)
How is pulmonary tuberculosis transmitted?	Airborne	201 (99.5)
How is pulmonary TB best diagnosed?	Sputum smear examination	169 (83.7)
What is the expanded form of DOTS?	Directly Observed Treatment – Short course	95 (47.0)
How many drugs are used in the intensive phase to treat a new case of sputum positive pulmonary TB?	Four	141 (69.8)
What is the minimum duration for which anti-tubercular treatment has to be given in a new case of sputum positive pulmonary TB?	6 months	168 (83.2)
What could happen due to incomplete or inappropriate treatment?	Drug resistance and spread of tuberculosis in the community	115 (56.9)
Practice-related questions		
What measures do you actually take to reduce risk of transmission of disease from a pulmonary TB patient?	Use face mask and ensure proper ventilation in the ward	143 (70.8)
Where do you collect the sputum samples of suspected pulmonary tuberculosis patients?	Outside the ward in the open	9 (4.5)

of the demographic factors. However, 37 (63.8%) subjects who had work experience in a tuberculosis ward as compared to 58 (40.3%) who had never worked in a TB ward were able to write the expanded form of DOTS (p value 0.002).

Regarding practice the demographic factors did not exert significant effect on responses to the following

question *i.e.*, 'Where do you collect the sputum samples of suspected pulmonary tuberculosis patients?' 66.7% (two) of the respondents who had developed tuberculosis and only 3.5% (seven) who had no history of suffering from tuberculosis gave correct response to this question (p value 0.001).

Except work experience in tuberculosis ward, the other demographic factors such as age, gender, total years of service and work experience in ICU did not lead to any significant differences in responses to the following practice-related question *i.e.*, 'What measures do you actually take to reduce risk of transmission of disease from a pulmonary tuberculosis patient?' 47 (81.0%) subjects who had work experience in a tuberculosis ward and 96 (66.7%) who had never worked in a TB ward gave correct responses to the question (p value = 0.042). Among the subjects who had work experience in a tuberculosis ward the duration of service in the tuberculosis ward did not have any statistically significant effect on the responses to individual knowledge or practice related questions and also on overall level of awareness.

Correct responses to six or more out of eight (75%) KAP questions is considered as satisfactory level of awareness.² It was found that only 86 (42.6%) subjects displayed this level of awareness. The satisfactory response levels were noted in 61(49.6%), 12 (27.9%) and 13 (36.1%) subjects in age groups 20-29 years, 30-39 years and ≥ 40 years respectively (p value 0.032). Also 33 (56.9%) with experience of work in a tuberculosis ward compared to 53 (36.8%) subjects who had no such experience had satisfactory level of awareness (p value 0.009). Gender, total work experience and work experience in ICU did not affect the level of awareness significantly.

Discussion

The study was conducted in a tertiary care private medical college hospital where regular training is imparted to nurses regarding infection control and patient care. The KAP of nurses can have a direct impact on how they deal with patients suffering from pulmonary tuberculosis and also on the occupational risk they themselves face.

Ailinger RL *et al* reported that in the general population in United States 10.2% of the respondents were worried about getting tuberculosis.³ However, 39.1% of our study subjects had such concerns. It is understandable since nurses work in close proximity of such patients than the general population. In our study nurses in the younger age groups (20-29 years) and also those with shorter period of service (15 years and less) had higher percentage of respondents who were concerned about acquiring pulmonary tuberculosis from patients. As responses to knowledge related question by these subgroups of age and experience were not significantly different from other subgroups we can assume that less experience and not lack of knowledge can be the reason for this fear. Gender, work experience in tuberculosis ward or ICU did not have any significant effect on the responses to the question which assessed their fear of acquiring tuberculosis.

The percentage of correct responses to knowledge related questions, *i.e.* regarding transmission, diagnosis and duration of treatment of pulmonary tuberculosis, was high probably reflecting the effect of regular teaching and training of all the nurses at this hospital. This may explain the results of our study which reveal that the demographic variables did not have any significant impact on the responses to these questions. The responses to other knowledge based questions revealed that less than half of the subjects could write the expanded form of DOTS. In view of the fact that Government of India is promoting DOTS in a big way, this lack of knowledge amongst nurses irrespective of age, gender, total period of service and work experience in tuberculosis ward shows that there is a need for further reinforcement of information dissemination methodology.

Only 115 (56.9%) of respondents gave correct response to question regarding the consequences of incomplete or inappropriate treatment. Kiefer E *et al* reported in a study from Peru that 6 out of 11 (54.6%) professionals, which included nurses and doctors, recognised that resistant tuberculosis or its spread can result from inadequate or incomplete treatment.⁴ In our study approximately one third

of the subjects did not know the correct number of drugs that are used in the intensive phase to treat a new case of sputum positive pulmonary tuberculosis. These lacunae in knowledge of a sizeable portion of the study population, when viewed in the context of the increasing drug resistance being encountered and the consequent treatment failures, assume importance as nurses are an important source of information and health care delivery to the patients, particularly in a developing country such as India. It was surprising to find that only 4.5% of respondents collected sputum in an open area. This deficiency in the practice is in sharp contrast to the high percentage of correct responses to knowledge related questions. This highlights the fact that, apart from regular imparting of knowledge, monitoring of routine practices needs to be strengthened. Approximately 30% of the respondents did not use the prescribed measures of infection control for pulmonary tuberculosis patients. Though significantly higher percentage of respondents who worked in tuberculosis ward followed the prescribed practices compared to those who had no such experience, one in five of the former group did not use these measures. The nurses in our study had access to all infection control measures. Thus, availability of such measures does not ensure full compliance. Sissolak D *et al* conducted a study on 20 nurses in a large tertiary academic hospital in Cape Town, South Africa.⁵ Making a similar observation they found that some participants, who were working in non-tuberculosis wards, admitted that although surgical masks were available in most wards, these were not used.

Gender and present work experience in ICU did not have any significant effect on the responses to any of the KAP questions in our study. The number of male nurses is increasing at various health facilities and our study reveals that KAP of these male nurses appears to be similar to that of their female counterparts. The nurses working in ICUs are expected to be better trained but surprisingly there was no significant difference in their KAP when compared to the ones not working in ICU.

In a systematic review, Joshi R *et al* reported that a

higher risk of acquiring tuberculosis was associated with different work locations such as inpatient tuberculosis facility, medicine ward, laboratory and emergency area.⁶ In our study, even though the results were not statistically significant, none of the three subjects who had developed tuberculosis had ever worked in a tuberculosis ward. Hence, it is evident that tuberculosis ward alone is not the only area in a hospital where risk of transmission is higher. Costa JT *et al* reported from Portugal that 18 (1%) out of 1849 nurses in their study had developed active tuberculosis.⁷ In our study, 1.5 % of the nurses had suffered from tuberculosis. This variation could be due to the difference in sample size of the studies and the difference in incidence of tuberculosis among countries.

Prado TN *et al* reported from University Hospital in Vitoria, Brazil that among the 25 health care workers who developed tuberculosis, 48% developed extra pulmonary tuberculosis, 44% pulmonary tuberculosis and 8% a combination of both.⁸ In the present study, three respondents had developed tuberculosis -two extra pulmonary and one pulmonary. Even in our study extrapulmonary tuberculosis was predominant but as only three subjects had developed tuberculosis the sample size is small and not comparable. Burrill D *et al* in a study from British Columbia which included 57 female nurses with tuberculosis found that 46% had extrapulmonary tuberculosis and also that those who had received BCG were less likely to get tuberculosis.⁹ Our study results are consistent with these findings regarding BCG vaccination status. Raitio M *et al* reported from Finland that 47 out of 58 nurses who developed tuberculosis belonged to age group 20-39 years.¹⁰ A similar trend was noted in our study although the results were not statistically significant.

Singla N *et al* have reported from Delhi that 40.2% of government nurses working in TB hospital and 10.7% working in general hospital displayed satisfactory level of awareness.² In comparison, the level of awareness was higher among nurses in our study. The nurses with TB ward experience also displayed higher level of awareness in our study. However, the settings of the studies and the type

questions asked to assess awareness were different. The limitation of the study is that it was conducted in a tertiary care private medical college hospital and hence results cannot be extrapolated to government institutions and primary care centres which cater to a large population in India. However, with the number of private medical colleges increasing it can be expected that such institutions will cater to greater percentage of the population in near future and in such a setting our results can be more relevant.

In conclusion, majority of the respondents did not choose the right location for sputum collection and this was the main area of deficiency among practice related issues. The demographic factors such as gender, total years of service and work experience ICU did not cause any significant difference in response to the individual questions assessing knowledge and practice. With less than fifty per cent of the respondents having satisfactory level of awareness there is a need to further strengthen the training and skill monitoring programs.

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