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ORIGINAL ARTICLE

Knowledge, Attitudes, and Practices Regarding Tuberculosis among Healthcare Workers in a Rural Hilly Terrain in Jammu

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ABSTRACT

Background: Healthcare workers (HCW) play a pivotal role in success of any public health program especially in case of infectious diseases like tuberculosis where they are the frontline warriors and therefore, should be fully equipped with knowledge and skills required in the diagnosis and management of tuberculosis. **Aim and Objective:** The aim of the study was to assess the knowledge, attitude, and practices of HCWs regarding TB in a remote hilly block of Jammu region. **Settings and Design:** Community Health Centre (CHC) and Primary Health Centers (PHC). **Materials and Methods:** This cross-sectional study was conducted in Billawar Tehsil, located in Kathua district of Jammu and Kashmir, India. 93 HCWs working in the CHC and nine PHC were assessed for their knowledge, attitude, and practices by personal interviews using a pretested semi-structured questionnaire. **Statistical Analysis Used:** The data were coded and entered into Microsoft Excel sheets. Proportions and percentages of correct/incorrect responses were calculated and presented in appropriate tables. **Results:** Attitude and practices of HCWs were found to be satisfactory while knowledge was good with regard to identification of symptoms, mode of spread, diagnostic tests, identification of risk factors, and preventive measures to avoid spread of TB to others but was inadequate with regard to the organs commonly involved, contact tracing and the time a patient takes to become non-infective after starting treatment. Regarding attitude and practices 91.4% of the HCWs agreed that they are at a higher risk of acquiring TB and 100% of them agreed that their knowledge should be continuously upgraded in the field of TB. About 92.4% of the HCWs wear a mask to prevent contracting TB at the workplace. About 82.8% of the HCWs claimed to always counsel patients about correct cough etiquette. **Conclusion:** Training and retraining of all cadres of HCWs about TB periodically, at regular intervals is imperative to improve case finding, diagnosis, and management of tuberculosis patients.

Key words: Tuberculosis, healthcare workers, India, KAP study

INTRODUCTION

Tuberculosis is a major public health problem caused by *Mycobacterium tuberculosis* and is one of the leading causes of death in the developing nations. Tuberculosis typically affects the lungs (pulmonary TB), but can also affect other sites (extra pulmonary TB). The disease spreads when people who are suffering from pulmonary TB expel bacteria into the air while coughing, talking, sneezing etc. A relatively small proportion (5–15%) of people infected globally with *M. tuberculosis* will develop TB disease during their lifetime.[1] However, the probability of developing TB disease is much higher among people infected with HIV; it is also higher among people affected by risk factors such as under nutrition, diabetes, smoking, and alcohol consumption.

2017, 2018, and 2019 global estimates revealed that about 10.0 million people (9.0–11.1 million) suffered from tuberculosis.[2-4] India stands first in the list of five countries

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which accounts for more than half of global burden of tuberculosis cases.[4] According to TB report of India, the estimated incidence for tuberculosis in India is 26.9 lakhs for the year 2019 accounting for about a quarter of the world's TB cases.[5] In addition to tuberculosis, there were about half a million new cases of rifampicin-resistant TB (of which 78% had multidrug-resistant TB) in 2018.[6] The three countries with the largest share of the global burden of MDR-TB in 2017 were India (27%), China (14%), and the Russian Federation (9%).[7]

Global targets and milestones for reduction in the burden of TB disease in the period 2016–2035 have been set as part of the Sustainable Development Goals (SDGs) and the WHO's End TB Strategy.[8] Indicators of SDG 2030 are 90% reduction in number of TB deaths compared with 2015 (%), 80% reduction (<20/100,000) in TB incidence rate compared with 2015 (%), and zero percent or no cost expenditure by TB-affected families facing due to TB whereas indicators set for End TB strategy are 95% reduction in number of TB deaths compared with 2015 (%), 90% reduction(<10/100,000) in TB incidence rate compared with 2015 (%) and zero percent expenditure by TB-affected families due to TB.[9] The Sustainable Development Goals and End TB Strategy targets set for 2030 cannot be met without intensive research and development.

No doubt, TB treatment and diagnosis have undergone rapid changes over the last few decades but much of success in TB scenario can be attributed to the availability of new and reliable diagnostic techniques and shorter treatment regimens. Despite dramatic improvements made since 1990s in providing access to high quality TB services, many people with TB remain undiagnosed or are diagnosed only after long delays. The high burden of undiagnosed TB causes much suffering and economic hardships and sustains transmission. Health care workers (HCWs) are expected to play a significant role in achieving SDG 3.0 and End TB targets by 2030. We can achieve our targets of TB elimination only when our frontline workers (health-care providers) have complete knowledge and proper understanding of tuberculosis.

India has a three-tier health delivery care system where the first point of contact is HCW in Sub centers namely, MPW Female and Pharmacist or ASHA in field areas. The success of RNTCP relies on the skills of these workers to identify the cases and refer them to higher centers. For carrying out their duties properly, as they themselves are at higher risk of acquiring active/latent tuberculosis infection these grass root level health workers should be fully aware of all the aspects of tuberculosis. Lack of knowledge in them may result in spread of tuberculosis including MDR tuberculosis coupled with unjustified delay in diagnosis and initiation of treatment. It is, therefore, important that their knowledge is updated regularly and they are aware of newer initiatives introduced in TB control programs.

There is evidence to suggest that awareness and practice toward tuberculosis and its infection control is poor in many primary and secondary care health facilities and as there is no published literature on the level of knowledge, attitude, and practices regarding tuberculosis among HCWs posted in hilly terrains of Jammu region, this study was planned to assess the same in a remote setting so that necessary actions can be taken to bridge the gaps and harness the capabilities of the HCWs which will go a long way in augmenting TB control activities in J&K state.

Aim and Objective(s)

The aim of the study was to assess the knowledge, attitude, and practices of HCWs regarding TB in a remote hilly block of Jammu region.

MATERIALS AND METHODS

Study Type

This was a cross-sectional study.

Study Population

The study population was HCWs working in study area.

Study Area

This study was conducted at Health facilities in Billawar Tehsil, District Kathua.

Study Duration

The study duration was 2 months, that is, June – July 2018.

Sample Size Calculation

Billawar is a tehsil located in the Kathua district of the union territory of Jammu and Kashmir having a population of 1, 97,644 spread across 65 inhabited villages. About 87% of the population resides in villages.[10] It is a hilly terrain. People here mostly seek treatment from Public health institutions and traditional healers. Kathua reported 972 cases of TB in 2016 for a population of 6.78 Lakhs giving a notification rate of 143/lakh population.[11] List of all the public health facilities were taken from Chief Medical Officer of Kathua district. Billawar Tehsil has 73 public Health facilities in all including one Community Health Centre (CHC), eight Primary Health Centers (PHCs), and the remaining are New type PHCs and subcenters.[10] Considering the time and resource constraint CHC and every ninth PHC was chosen using systematic sampling. The health facilities are operational for 6 days a week for 6½ h from 10:00 am to 4:30 pm. For the present study, all the HCWs working in the CHC and the nine primary health-care centers were studied.

Inclusion Criteria

All the HCWs who were willing to participate and gave their verbal consent were included in the study.

Exclusion Criteria

HCWs who were absent on the day of study were excluded from the study.

Strategy for Collection

The investigator approached the Chief Medical Officer and the Block Medical Officer of Billawar tehsil to sensitize and brief them about the study and solicit their cooperation to conduct the study on HCWs. The HCWs who were interviewed included – Medical officers, physicians, nurses, pharmacists, lab Technicians, X-ray technicians, Female Multipurpose Health Workers, dental technicians, health inspectors, health educators, ophthalmic technicians, basic health workers, and ASHA workers. The HCWs were interviewed face-to-face with the help of a pre tested semi-structured questionnaire after obtaining their verbal consent. The semi-structured questionnaire consisted of two parts. Part A comprised questions about socio demographic information and Part B comprised 21 questions. Out of these, eight questions were concerning knowledge, six were regarding attitudes, and seven were about practices regarding TB. The questions were about symptoms, transmission, risk assessment, investigation of TB suspects, tracing of contacts, and interaction with patients. Both open and closed ended questions were used in the questionnaire. The questionnaire was translated into Hindi and retranslated back to see whether it conveyed the correct meaning.

HCWs (excluding the ASHAs) in each of these health facilities were informed about the study a day before they were interviewed, so that maximum strength of the enrolled HCWs could be achieved on the day of the interview. The investigator on next day started with the interviews of present HCWs at around 8:30 am, in each health facility and continued till all the available HCWs who were present, could be interviewed. Interviews were conducted in two spells of 1 week each. Every worker was interviewed for an average duration of 20–25 min. The privacy and confidentiality of participants were ensured.

The ASHA workers were specially called on two separate days at the PHC headquarters by the written communication from the BMO. As such, 31 ASHA workers were interviewed. Each ASHA was interviewed for an average duration of 20–25 min ensuring their privacy and confidentiality. All completed questionnaires were cross-checked and edited on the same day and before data entry to ensure data consistency and completeness. Ethical Approval: Approval was taken from Institutional Ethical Committee.

Data Analysis

The data were coded and entered into Microsoft Excel sheets. Percentages of correct/incorrect responses were calculated and presented in appropriate tables. The knowledge and practice variables were scored and ≥70% correct responses for a question by HCWs were considered as a good level of knowledge/practices for that aspect or else they were considered to have unsatisfactory knowledge/practices for that aspect. The attitude variables comprised six statements with response categories "Agree," "Disagree," or "Neutral" and ≥70% correct responses for a statement were considered as having positive attitude toward that aspect.

RESULTS

A total of 93 HCWs were interviewed by the investigator (62 HCWs out of the 86 HCWs working in the CHC, 9 PHCs, and 31 ASHA workers out of the 37 ASHAs working under these 9 PHCs and the CHC). The rest of them (26) study participants were absent on the day of interview. The response rate observed was thus 78.2%.

Table 1, the mean age of the HCWs was 40.05 ± 10.0 years. Females outnumbered the males 58.1%. Approximately 80% of the HCWs interviewed possessed a work experience of less than 20 years while only 20% of the HCWs had a work experience of more than 20 years. Almost all the categories of HCWs were interviewed.

As shown in Table 2, almost more than half of the HCWs were completely aware about the major symptoms and the mode of spread of tuberculosis. Majority of the HCWs 91.38% believe that sputum can be tested to diagnose TB. 1/5th of The HCWs

Table 1: Socio demographic characteristics of the healthcare workers

Variable	Category	HCWs (*n*=93)	Percentage
Age (in years)	21–30	20	21.5
	31–40	37	39.8
	41–50	17	18.3
	51–60	19	20.4
Sex	Male	39	41.9
	Female	54	58.1
Work experience (in years)	<10	28	30.1
	10–19	45	48.3
	20–29	12	12.9
	30 or more	8	8.7
Categories of HCWs	Doctors	14	15.1
	Lab/X-ray/technicians	14	15.1
	Paramedical Staff (nurses, pharmacists)	17	18.3
	Field Health workers	17	18.3
	ASHA Workers	31	33.2

Table 2: Level of awareness of healthcare workers regarding tuberculosis

Knowledge domain	Responses by HCWs *n*=93 (%)	Remarks
Identification of symptoms of TB		Correct includes fever, cough and other symptoms of TB such as weight loss, and night sweats.
Correct response	51 (54.8)	
*Partially correct response	35 (37.6)	*HCW answered cough along with any other symptoms excluding fever
Incorrect response	7 (7.5)	
TB patients spread infection to others by		NA
Droplet Infection	52 (55.9)	
Close contact	32 (34.4)	
Sharing same vessels	3 (3.2)	
Do not know	6 (6.45)	
TB can be diagnosed by		*Any other(s) includes Mantoux test and/or CB-NAAT
Sputum test, X-ray Chest, *Any other(s)	20 (21.5)	
Sputum test , X-ray chest	45 (48.3)	NA
Sputum test	20 (21.5)	
Do not know	8 (8.6)	
Individuals at high risk of acquiring TB		NA
Family members	28 (30.1)	
Poverty and malnutrition	11 (11.8)	
Smokers	3 (3.2)	
All of the above	45 (48.3)	
Do not know	6 (6.4)	
Organs commonly affected by TB		NA
Pulmonary and Extra Pulmonary	62 (66.7)	
Pulmonary	24 (25.8)	
Does not know	7 (7.5)	
For prevention of infection to others TB patient should		NA
Wear a mask, Practice cough etiquette and Isolate himself	44 (47.3)	
Wear a mask and *Any other(s)	4 (4.3)	*Any other(s) includes Taking ATT and/or keeping the patient in well ventilated conditions and/or maintaining patient's hygiene
Isolation and *Any other(s)	15 (16.1)	
Cough etiquette and *Any other(s)	19 (20.4)	
Wear a mask, practice cough etiquette, isolation, taking Full ATT and separate vessels for the TB patient	5 (5.3)	NA
Do not know	6 (6.4)	
In how much time a patient becomes Non infective after starting treatment		NA
72 h	2 (2.1)	
1 week	1 (1.0)	
2 week	6 (6.4)	
1 month	78 (83.8)	
Do not know	6 (6.4)	
Knowledge about the term' contact tracing' in TB		NA
Yes	3 (3.2)	
No	90 (96.8)	

were aware of Mantoux test and/or CB-NAAT as diagnostic tests for TB. About 78.4% of the HCWs believe that family members are at a high risk of acquiring TB. More than 6% of the respondents have poor knowledge about the mode of spread of TB and who is at high risk of acquiring TB while more than 7% of them have poor knowledge regarding the symptoms, diagnostic tests and the organs affected by TB.

As shown in Table 3, majority 91.4% of the HCWs agreed that they are at a higher risk of acquiring TB. All of them 100% agreed that their knowledge should be continuously upgraded in the field of TB. About 10.7% of the respondents disagreed and 24.7% were neutral to the statement that HIV positive HCWs should not work in TB wards.

As shown in Table 4, 60.2% of the HCWs wear a mask, and keep distance from tuberculosis patients to prevent contracting TB at the workplace. About 33.3% of the HCWs said that they take care of their diet and try to ensure ventilation in their surroundings as a measure to avoid contracting TB. About 82.8% of the HCWs claimed to always counsel patients about correct cough etiquette while 8.6% of the HCWs reported to have never done so.

DISCUSSION

This study assessed the knowledge, attitudes, and practices of HCWs regarding TB in a remote hilly block of Jammu region. The study findings are expected to enrich our understanding about HCWs working in difficult terrains and where the population seeking health services has to wholly depend on public health facilities. The reliance on public health infrastructure can only be gainfully used if those who deliver these services are knowledgeable and skillful. It must be kept in mind that the actual awareness in HCWs may have been underestimated as not all HCWs are directly involved in the delivery of TB related services. The fact that we have been able to achieve a satisfactory response rate adds value to the observations made.

Table 3: *Attitudes of HCWs regarding TB

Statements	Agree *n* (%)	Neutral *n* (%)	Disagree *n* (%)
HCWs have a higher risk of acquiring TB	85 (91.4)	6 (6.45)	2 (2.15)
Finding every new case of TB is essential for the control of the disease	85 (91.4)	7 (7.5)	1 (1.07)
HCWs should be screened for TB	81 (87.1)	12 (12.9)	0
HIV positive HCWs should not work in TB wards	60 (64.5)	23 (24.7)	10 (10.7)
Separating active TB patients from other patients is an effective strategy for preventing transmission of tuberculosis	82 (88.2)	9 (9.7)	2 (2.15)
Knowledge of HCWs should be continuously upgraded on recent advances in the field of tuberculosis	93 (100)	0	0

*Attitudes were measured using 5 point Likert scale and for the sake of presentation. Likert scale was collapsed to 3 point scale

About 3.2% of the HCWs in our study believe that TB spreads by sharing the same vessels. A study done on HCWs in Russia regarding TB showed that HCWs had beliefs like TB spreads by sharing the same vessels.[12] They also believe that having a full stomach before interacting with TB patients will not let the bacillus survive, if they contract it.

As seen in our study, 78.4% of the HCWs believe that family members are at a high risk of acquiring TB. The fact that a significant majority of HCWs believe this, points to how they look at TB as a disease, which if affects one person in a family, will spread to the whole family. This could be one of the strong factors that lead to stigma regarding this disease in such a setup.

About 73% of the HCWs interviewed believe that a patient of TB should be isolated from others, to prevent the spread of infection. Hence, they do have a basic idea about isolating the TB patient but also when asked how much time it takes for a person to become non infective after starting treatment, 83.8% of them believe that it takes 1 month. This highlights out that they could be unduly isolating TB patients in the society and this could be a factor in stigmatizing TB in their society.

When asked about the practice of contact tracing, 79.5% HCWs in our study reported that their institution follows contact tracing while 9.6% of them reported that it does not. While on the contrary, in a similar study in Botswana[13] 38% of the HCWs interviewed, reported to have never done contact tracing. Training and retraining HCWs in the knowledge, attitudes, and practices and on contact tracing could help to fill this gap in contact tracing in our study's setup.

Furthermore, as found in our study, 88.2% of the HCWs believe that separating active TB patients from other patients is an effective strategy for preventing TB transmission. A similar amount of HCWs (91.4%) in a setting in Ethiopia believed that TB patients should have a separate ward.[14]

In a study done in Uganda, 95% of the HCWs knew that TB is the most common opportunistic infection affecting people with HIV.[15] Contrary to this, 35.4% of the HCWs interviewed in our study did not know that TB and HIV have a more fatal effect when together, in the same patient, as they were neutral or did not agree to the statement – "HIV positive HCWs should not work in TB wards." This finding emphasize the need for educating the HCW's on various aspects of TB and HIV.

Table 4: Practices of HCWs regarding TB

Practices	Frequency (*n*=93)	Percentage
Precautions HCWs observe to prevent contracting TB at the workplace		
Wear a mask	44	47.3
Wear a mask and stay at a distance from TB patients	12	12.9
Any other*	31	33.4
Not aware of what precautions to take	6	6.4
Does your institution follow contact tracing?**		
Yes	74	79.6
No	9	9.7
Sometimes	10	10.7
Do you counsel patients about correct cough etiquette?		
Always	77	82.8
Sometimes	8	8.6
Never	8	8.6
Do you ensure that a patient has taken the full treatment?		
Always	48	51.6
Sometimes	31	33.3
Never	14	15.1
Do you try to see coughing patients at first, in other words, if there are coughing patients in the waiting area, do you give them priority?		
Always	13	13.9
Sometimes	37	39.8
Never	43	46.3
Have you come across patients who substitute DOTS for traditional or alternative medicine?		
Yes	78	83.8
No	9	9.7
Do not know	6	6.5
Having been in contact with TB patients, would you get tested for TB in case you have cough?		
Always	23	24.7
Sometimes	51	54.8
Never	19	20.5

*Any other(s) include taking a good diet to have a good immune system and/or maintaining adequate ventilation at the work place and/or having a full stomach before meeting TB patients

We can say that people in a rural hilly setup, are more complacent with traditional healers as 83.8% of the HCWs have come across patients who substitute DOTS for traditional medicine.

As found in our study, 82.8% of the HCWs claim to always counsel patients about correct cough etiquette and 8.6% never do so while a similar study by Shrestha *et al*. in Nepal, showed that only 38.3% of the HCWs always educate patients on cough etiquette and 4.7% never do so.[16]

A majority (91.4%) of our HCWs agree that they have a higher risk of acquiring TB, due to their occupation. This is in consistency with the finding of a study by Menzies *et al*. that in HCWs from low- and middle-income countries, TB remains a very important occupational risk.[17]

CONCLUSION AND RECOMMENDATION

In our study, overall knowledge, attitude, and practices were found to be adequate in some domains and unsatisfactory in others. The knowledge of HCWs should be refreshed from time to time with the help of Continued Medical Education, Information Education Communication activities and Focused Group Discussion so that their previous knowledge is updated and they are aware of newer initiatives introduced in TB control programs.

Limitation of the Study

Due to small sample size it is possible that a whole array of knowledge and practices could not be investigated. The study was conducted in duration of 2 months and due to time constraints, HCWs from all the health facilities of the area could not be covered. Furthermore, the knowledge, attitudes, and practices were presented in the results without differentiating them for HCWs of different cadres.

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