

Knowledge, Attitude and Practices Regarding Tuberculosis among Outpatients of a Rural Field Practice Area: A Cross-sectional Study in Uttar Pradesh, India

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ABSTRACT

Introduction: Tuberculosis (TB) is a significant cause of morbidity worldwide, especially in the low and middle-income countries like India and is found to be more common in the rural areas. Delays in diagnosis and initiation of treatment along with lower treatment adherence and completion rates have increased the morbidity and mortality of TB in the rural areas. The collation of information accumulated through the assessment of people's Knowledge, Attitude, and Practices (KAP) towards TB, helps in charting new health programs for the public, identifying lacunae, and devising interventions based on these lacunae, which in turn will help us to achieve the vision of a "TB free India" by 2025.

Aim: To determine KAP and its association with TB among the study subjects.

Materials and Methods: This was a cross-sectional study conducted on patients attending Outpatient Department (OPD) at the Rural Health Training Centre (RHTC) attached to NCR Institute of Medical Sciences, Meerut, Uttar Pradesh, India,

during January 2021 to April 2021. From a sample of 106 patients data of KAP regarding TB was collected via a structured questionnaire, which was predesigned and pretested. Pearson's Chi-square test was used to ascertain the association between subjects' KAP regarding TB. A p-value <0.05 was taken as the predictor of statistical significance.

Results: Out of 106 patients, 72 (67.92%), 80 (75.47%), and 52 (49.06%) had adequate KAP, respectively. Participants having adequate knowledge showed positive attitude and good practices and this association was found to be statistically significant.

Conclusion: The study results reflect that having adequate knowledge of the disease transforms into good practices and a positive attitude towards a person suffering from the said disease as well as helps the people to have a positive frame of mind in case they themselves contract the disease. Hence, health education and behaviour change communication needs to be scaled up in rural communities to prevent, detect, and treat TB to achieve a TB free India.

Keywords: Behaviour, Community, Health education

INTRODUCTION

TB is a significant cause of morbidity worldwide, especially in low and middle-income countries like India [1]. Globally, not only does it rank among the top 10 causes of mortality but is also the main cause of mortality due to a single infectious agent (ranking above Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome [HIV/AIDS]) [1]. Many social and cultural factors too add to the disease morbidity, making TB a social disease as well [2]. India is responsible for one-fourth of the global TB burden [1]. As per National TB Prevalence Survey (2019-2021), in the year 2021, TB's prevalence in India of all forms, for all age groups was 312 per lakh population [3].

In countries such as ours where more population resides in the rural areas [4], the TB incidence in rural areas is found to be either greater than or equal to that of large urban locales, with rural residents having a higher risk of contracting TB disease [5]. According to the evidence from National Family Health Survey (NFHS)-4 data, TB was found to be more common in the rural areas of India [6]. In contrast, a study by Pandey S et al., found that although the incidence of TB was more in urban India, the average duration of disease before cure or mortality was more in rural India, which could lead to the relatively high prevalence in these settings [7]. Delays in diagnosis and initiation of treatment along with lower treatment adherence and completion rates have also been observed in the rural communities. Results of such delays in rural areas manifest as rising disease morbidity and mortality,

enhanced transmission risk, and the emergence of drug-resistant forms of TB [5].

Along with this, the rural residents face the added challenges of a lower standard of living, a deficit of health services, traditional beliefs and misconceptions, and the deep-rooted stigma of TB disease, which reflects the risk that TB poses for the rural dwellers and highlights the importance of health advocacy, communication, and social mobilisation in rural communities [8-10].

Adequate knowledge and attitude not only helps in breaking the transmission cycle of the disease but also helps in reducing the stigma associated with it. The collation of information accumulated through the assessment of people's KAP towards TB, helps in charting new health programs for the public, identifying lacunae, and devising interventions based on these lacunae. This will help not only in achieving a "TB free India" by 2025 but will also help in actualising the Stop TB strategy's vision of bringing the deaths, disease, and suffering because of TB worldwide to zero levels [11,12].

Hence, the current study aimed to ascertain the KAP regarding TBs among the study subjects of a rural area.

MATERIALS AND METHODS

This cross-sectional study was conducted at the village Peepli Khera, one of the rural field practice area attached to NCR Institute of Medical Sciences, Meerut, Uttar Pradesh, India. According to 2011 census, only 46.73% of this village's residents are literate with a working population of only 33.3% [13]. The means of

earning in this area is through wage labour, carpentry, painting, farming etc.

The study subjects were the patients attending the OPD (for any illness, unless seriously ill) at RHTC during the study period. Data collection was completed in four months, from January 2021 to April 2021. Before data collection, ethical permission was obtained from Institutional Ethics Committee (IEC) (IEC19/NCRIMS006/Com. Med/003-OP/08-12-2020).

Inclusion criteria:

- All the patients from the village Peepli Khera attending the RHTC within the time frame of the study.
- Age ≥ 18 years.
- Gave consent to participate in the study.

Exclusion criteria:

- Any seriously ill patient.
- Refused to participate in the study.
- Age < 18 years.

Sample size calculation: Sample size was calculated using formula of $n = Z^2pq/d^2$; taking 95% Confidence Interval (CI), 10% absolute error (d), and p as 45.5% (based on the study done by Angeline GG et al., in the year 2018 in a rural area of Tamil Nadu where 45.2% of the study subjects had adequate knowledge about TB) [14]. Based on the above assumptions and by adding 10% non-response rate to the initial sample size, the final sample size was 106.

Data Collection

The study participants were briefed about the purpose and nature of the study. After taking informed consent, data was collected by pretested structured questionnaire. The questionnaire for the study was prepared after an extensive review of pertinent literature [8-14]. The data collection tool was first generated in the English language and was then backward translated to the local (Hindi) language. The tool includes the participant's socio-demographic details (age, gender, education, occupation, and income) and questions on the participant's knowledge, attitude, and practices about TB. The collection of data was done through face-to-face interviews. Before data collection, a pilot study was conducted for validation of the questionnaire.

The questionnaire consisted of seven questions to assess participants' knowledge and four each to assess their attitude and practice respectively. A correct response for every question was assigned a score of 1 and a score of 0 was given for every incorrect response or answer not given/known. The total score was generated by adding all the correct responses. If the resultant total scores of the respondents exceeded 50%, they were categorised as having "adequate knowledge" (total correct score > 4), "positive attitude" (total correct score > 2), and "good practice" (total correct score > 2), otherwise, they were categorised as having "inadequate knowledge" "negative attitude," and "poor practices" [14].

STATISTICAL ANALYSIS

The data was analysed using International Business Machines (IBM) Statistical Package for the Social Sciences (SPSS) version 23.0 and were expressed as proportions. Pearson's Chi-square test was used to ascertain the association between subjects' KAP about TB. A p-value > 0.05 was taken as the predictor of statistical significance.

RESULTS

A total of 106 subjects participated in the study. Participants involved in this study were in the age group of 18-73 years. The mean age (\pm standard deviation) of the participants was 39.42 years (± 14.64).

The socio-demographic characteristics of the study participants are summarised in [Table/Fig-1].

Characteristics	n	%
Gender		
Male	41	38.68
Female	65	61.32
Age (in years)		
≤ 45	74	69.81
> 45	32	30.19
Marital status		
Single	8	7.55
Married	98	92.45
Religion		
Hindu	21	19.81
Muslim	85	80.19
Type of family		
Nuclear	41	38.68
Joint	65	61.32
Occupation		
Employed	59	55.66
Unemployed	47	44.34
Education		
Illiterate	44	41.51
Literate	62	58.49
Monthly income (in Rs)		
≤ 15000	54	50.94
> 15000	52	49.06

[Table/Fig-1]: Socio-demographic characteristics of the respondents (N=106).

Knowledge of the participants about the cause, symptoms, transmission, prevention, and treatment of TB: A total of 72 (67.92%) study subjects had adequate knowledge on TB (Total correct response was $> 50\%$). [Table/Fig-2] summarises the different components of participants "knowledge" towards TB. The most common symptom of TB mentioned by the study subjects was cough (82.08%) followed by weight loss (73.58%), fever (55.66%), and loss of appetite (50.0%). The majority of the participants (83.96%) were knowledgeable about the communicability of the disease. Transmission of TB through air was correctly reported by only 15 (14.15%) of the subjects. As few as 29 (27.36%), study subjects knew that TB is caused by bacteria. Although, most of the participants (71.70%) knew TB to be a curable disease only 48 (45.28%) participants were aware that its transmission is preventable. Three-quarters of the respondents (75.47%) were cognizant of the fact that TB could be cured through medications available at health facilities.

Attitude of the participants towards TB: Attitude of study participants towards TB is summarised in [Table/Fig-3]. Overall 80 (75.47%) of the participants had positive attitude towards TB. Approximately 38 (35.85%) of the subjects considered TB as a very serious disease and 8 (7.55%) as not serious illness. The majority of the participants (73.58%) also knew that anyone could get TB. Regarding the "participant's reaction," if diagnosed with TB, 43 (40.57%) said they would experience fear, while only 18 (16.98%) participants said that they will confidently deal with it. On probing about their behaviour towards people suffering from TB, majority of the participants (78.30%) responded that they would feel compassion for them; of these 64 (60.38%) of the subjects were willing to help while the rest would try and avoid the diseased persons.

Variables		n	%
Cause of TB	Bacteria/Infection by germs	29	27.36
	Smoking/tobacco use	23	21.70
	Shortage of food	7	6.60
	Cold air/dust/hot climate	15	14.15
	Don't know	32	30.19
Symptoms of TB *	Cough >2 weeks	87	82.08
	Weight loss	78	73.58
	Loss of appetite	53	50.00
	Fever	59	55.66
TB can be transmitted from one person to another	Yes	89	83.96
	No	2	1.89
	Don't know	15	14.15
How can a person get TB	Through air when a person with TB sneezes or coughs	41	38.68
	Through sharing items/eating from same plate	21	19.81
	Through touching items in public places/handshakes	23	21.70
	Don't know	21	19.81
Transmission of TB is preventable	Yes	48	45.28
	No	7	6.61
	Don't know	51	48.11
TB is curable	Yes	76	71.70
	No	6	5.66
	Don't know	24	22.64
How can TB be cured	Medicines given in health institutions	80	75.47
	Herbal remedies	4	3.78
	Home rest without medicine	1	0.94
	Praying	0	0
	Self-treatment	1	0.94
	Don't know	20	18.87

[Table/Fig-2]: Knowledge of the participants on cause, symptoms, transmission, treatment, and prevention of TB (N=106).
*Multiple responses

Variables		N	%
Opinion about seriousness of TB disease	Very serious	38	35.85
	Somewhat serious	47	44.34
	Not very serious	8	7.55
	Don't know	13	12.26
Anybody can get TB	Yes	78	73.58
	No	9	8.49
	Don't know	19	17.93
Reaction if diagnosed with TB	Fear	43	40.57
	Surprise	9	8.49
	Confident	18	16.98
	Hopelessness	9	8.49
	Embarrassment	5	4.72
Feeling towards people with TB	Don't know	22	20.75
	Compassion and desire to help	64	60.38
	Feel compassion, but tend to stay away from them	19	17.92
	It is their problem, I can't get TB	3	2.83
	I fear them because they may infect me	8	7.55
	No particular feeling	2	1.89
Don't know	10	9.43	

[Table/Fig-3]: Participants attitude towards TB (N=106).

Practices of the participants towards TB: The study population's practices' regarding TB have been outlined in [Table/Fig-4]. Almost

half of the study subjects (49.06%) had good practices regarding TB. The number of study subjects who opined that they would seek medical aid as soon as they realised that their symptoms could be due to TB, would take treatment from a health centre, and consult a doctor/other health personnel in case they contracted TB was almost similar; 49 (46.23%), 52 (49.06%), and 48 (45.28%) respectively. Regarding the community's behaviour towards people suffering from TB, most of the study participants responded that although the people are cordial they tend to stay away from the diseased person (43.40%).

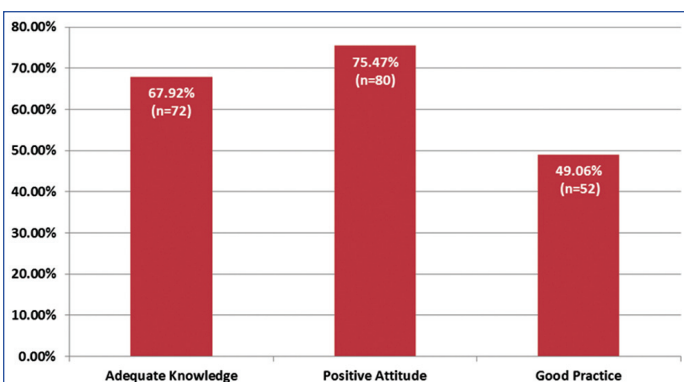
Variables		n	%
Who would you talk to if you had TB?	Doctor or other medical worker	48	45.28
	Spouse	21	19.81
	Parent	3	2.83
	Close friend	4	3.77
	Children	6	5.66
	Other family members	4	3.77
	Don't know	20	18.87
What would you do if you thought you had symptoms of TB?	Self-treatment options	3	2.83
	Go to health facility	52	49.06
	Go to pharmacy	9	8.49
	Go to traditional healers	12	11.32
	Don't know	30	28.30
If you had symptoms of TB, at what point would you seek medical help?	When treatment on my own doesn't work	3	2.83
	When symptoms look like TB last for >2 weeks	28	26.41
	As soon as I realise my symptoms might be related to TB	49	46.23
Behaviour of the Community towards people with TB	Don't know	26	24.53
	People in the village reject him/her	4	3.77
	People are friendly but they try to avoid him/her generally	46	43.40
	People mostly support and help him/her	39	36.79
	Don't know	17	16.04

[Table/Fig-4]: Practices of the participants towards TB (N=106).

Broadly, adequate knowledge, positive attitude, and good practice regarding TB was found in 72 (67.92%), 80 (75.47%), and 52 (49.06%) participants, respectively. Adequate knowledge was significantly associated with positive attitude as well as good practice [Table/Fig-5-7].

Parameters		Adequate knowledge	Positive attitude	Good practices
Age (in years)	≤45	63.5%	70.3%	48.60%
	>45	78.1%	87.5%	50.00%
Sex	Female	63.1%	73.8%	41.50%
	Male	75.6%	78.0%	61.00%
Religion	Hindu	57.1%	66.7%	42.90%
	Muslim	70.6%	77.6%	50.60%
Family type	Joint	66.2%	75.4%	49.20%
	Nuclear	70.7%	75.6%	48.80%
Monthly income (In Rs)	≤15000	64.8%	74.1%	38.90%
	>15000	71.2%	76.9%	59.60%
Educational status	Illiterate	65.9%	77.3%	38.60%
	Literate	69.4%	74.2%	56.50%
Occupation	Unemployed	59.6%	70.2%	44.70%
	Employed	74.6%	79.7%	52.50%

[Table/Fig-5]: Socio-demographic factors associated with over all knowledge, attitude, and practice of participants towards TB (N=106).



[Table/Fig-6]: Percentage of study participants who have adequate knowledge, positive attitude, and good practices (N=106).

Knowledge	Attitude				Practices			
	Positive		Negative		Good		Poor	
	N	%	N	%	N	%	N	%
Adequate	72	100.0%	0	0.0%	52	72.20%	20	27.80%
Inadequate	8	23.5%	26	76.5%	0	0.00%	34	100.00%
p-value (using Chi-square test)	<0.0001				<0.0001			

[Table/Fig-7]: Knowledge associated with attitude and practice towards TB (N=106).

DISCUSSION

Good knowledge, positive attitude, and good practices are essential for the elimination of TB. The current study, which was carried out among 106 adult rural inhabitants of Uttar Pradesh, India, exhibits the respondents' KAP regarding TB, which are further deliberated upon as follows.

Knowledge Regarding TB

In the current study, 72 (67.92%) participants had adequate knowledge about TB as a disease. These results are in sync with studies carried out by Bashorun AO et al., [15] in Gambia and Laiby et al., [16] in Mumbai where 66.9% and 60% of the participants had good knowledge regarding TB. In contrast, Angeline GG et al., in their study done on a rural population in Tamil Nadu reported that only 45.5% of their study population had adequate knowledge about TB [14].

The knowledge on the bacteria or infection by germs as the cause of TB was limited (27.36%); this low awareness on the cause has also been reported in various studies ranging from as low as 2% to as high as 60.2% [16-22]. This difference in knowledge can be attributed to the geographical area and the education level of the study subjects. Awareness on the causal factor of disease is highly essential as it influences the patient's health seeking behaviour.

As for the knowledge of the symptoms of TB, 87 (82.08%) respondents knew cough as the main symptom of TB. More than half of the respondents were also aware about other TB symptoms such as fever, weight loss, and loss of appetite. This heightened awareness of TB symptoms is encouraging as this can improve passive case finding. These results are in tune with the study done by Jangid VK et al., in Bikaner, where 81.3% of the subjects and study by Shidam UG et al., in rural area of eastern Maharashtra where 80% of the participants mentioned persistent cough as the most common symptom [17,23]. Similar results were also reported in the midline survey done by International Union Against Tuberculosis and Lung Disease. The survey found that most of the general population was aware of "cough of 2 weeks" as a TB symptom (83%) [24]. In various other international studies, the percentage of people acknowledging persistent cough as one of the major symptoms of TB ranges

from 39.4 to 85.5% [18,21]. Being aware of the symptoms of TB is critical as it helps the patients as well as their peers and family members who have similar symptoms to seek medical aid at the earliest.

A total of 89 (83.96%) of present study participants' knew TB to be an infectious disease. In comparison, a slightly higher proportion of awareness about the communicability of TB was reported by Konda SG et al., in their study subjects (87%) [25]. This difference may have arisen because of the difference in the study area, which was an urban township in the latter while present study was carried out in a rural area. Studies by Angeline GG et al., (79%), Jangid VK et al., (77.4%), Tolossa D et al., (80%), and Sonawane NS and Patil CR (58.67%) have all reported a lower proportion of study subjects aware of the infectiousness of the disease [14,17,20,26].

In the present study, not even half of the respondents (45.28%) knew that the transmission of TB can be prevented. Angeline GG et al., and Sonawane NS and Patil CR reported even a lower proportion of study subjects (35.3% and 36.36% respectively) aware that TB transmission is preventable [14,26]. Various other national and international studies have reported the percentage of participants mentioning that TB can be prevented ranging from 58.6% to as high as 98.2% [16,20,21,27,28]. Awareness about the infectivity and transmission among the people will help in reducing its spread to family members and community as this knowledge will help them inculcate infection control and prevention practices of tuberculosis [24].

Approximately 71.70% of this study subjects were aware that TB is curable which is in agreement with the study done by Angeline GG et al., where 71% of the participants knew that TB can be cured [14]. Several other studies have reported slightly higher percentage of this knowledge, spanning from 80.3-94.4% [14-18, 20,23,24,26-28].

It has been reported in literature that adequate knowledge influences people's practices against infectious diseases [29]. Based on present study findings, it can be inferred that though the participants' aggregate knowledge about TB (67.92%) was better than in some other countries [21,30]; still a lot more awareness needs to be spread among the general population if we are to achieve the target of eliminating tuberculosis by 2025 [12].

Attitude Towards TB

In the current study, approximately one-third (36%) of the respondents considered TB to be a critical disease. This shows a lax attitude towards a disease whose one-fourth global burden our country contributes to. This result was in agreement with the study of Angeline GG et al., where too less than half of the respondents (41.7%) were aware that TB is a critical disease [14]. Most of the other studies have shown a higher proportion of respondents (52.8% to 80%) aware about the seriousness of TB as a disease [14,15,17,19,22,24,26]. This difference could be because the current study subjects were from a rural area, of low socio-economic status, and mostly illiterate.

Fear and embarrassment is a major emotion that the infected person may feel on being diagnosed with TB for fear of apathy, stigma, and discrimination from the community [24]. Most of the respondents (40%) in the current study reported that they would feel afraid if they were diagnosed with TB, while one-fifth of them were not sure of their feeling if diagnosed with the disease. Only a handful of the participants (16.98%) said that they would face the situation with hope and confidence. Going through the literature we find that fear and embarrassment is a predominant emotion, from as low as 32%

to as high as 69.3% that the participants would feel if diagnosed with the disease [14,15,19,18,26].

It was seen that having adequate knowledge about TB translated to a positive attitude among the participants and this association was found to be statistically significant. Hence, efforts should be concentrated on educating the masses about TB so as to bring about a positive behavior change among the people in their conduct towards people suffering from TB.

The overall positive attitude towards TB in the current study was 75.47% which is quite better than some other studies [14,15,21,30] and little less than the study conducted in urban adults by Laiby et al., where 88.5% of study participants had an overall favorable attitude towards TB [16].

Practices Related to TB

When it came to the practices related to TB, almost half (49.06%) of the study subjects opined that in case they developed symptoms of TB they will visit a health facility. This result is in sync with the study of Angeline GG et al., where 49% of the participants too had the same response [14]. Although, some international studies have reported a higher percentage, where the majority of the participants responded that they would visit a health facility if they felt that they had symptoms of TB [16,19]. This is indicative of good health seeking behaviour and efforts should be directed towards educating the people to seek medical help as soon as they develop any one of the TB presumptive symptoms.

According to the participants, help from the community for the diseased people was also not forthcoming as most of the villagers try to avoid them (43%). The level of knowledge of the respondents about TB also influenced their practices. This underlies the importance of educating the masses regarding TB, so that, they may extend their support to TB patients. Such practices perpetuate and sustain stigma and discrimination toward patients with TB in the communities and they need to be identified and eliminated at the earliest if we want to achieve our vision of a TB free India [24].

In the present study, the aggregate good practice toward TB was 49.06%. This result is slightly better than a study carried out in Iran where the proportion of aggregate preventive practices toward TB was found to be 42.6% [27]. In contrast, some other studies have reported a higher proportion of study subjects with good practices towards TB [15,16,30]. This difference could be because these studies were either from other countries or were carried out in urban areas and hence, the study subjects may have had better access to health services, media, and/or better health literacy through effective health education programs.

Limitation(s)

The current study was carried on a small scale with only 106 study subjects and covered only the rural population. Conducting the study on a larger scale with more diverse populations would have yielded more generalisable conclusions and a more comprehensive visualisation of the people's knowledge, attitude, and practices related to TB.

CONCLUSION(S)

The study results reflect that having adequate knowledge of the disease transforms into good practices and a positive attitude towards a person suffering from the said disease as well as helps the people to have a positive frame of mind in case they themselves contract the disease. Hence, health education and behaviour change communication needs to be scaled up in rural communities to prevent, detect and treat TB to achieve a TB free India.

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PLAGIARISM CHECKING METHODS: [\[Jain H et al.\]](#)

- Plagiarism X-checker: May 16, 2022
- Manual Googling: Jul 07, 2022
- iThenticate Software: Jul 28, 2022 (5%)

ETYMOLOGY: Author Origin**AUTHOR DECLARATION:**

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **May 10, 2022**Date of Peer Review: **May 19, 2022**Date of Acceptance: **Jul 14, 2022**Date of Publishing: **Aug 01, 2022**