VER
Vascular & Endovascular Review

Knowledge, Attitude And Practice Regarding Pulmonary Rehabilitation Among The Patients With Pulmonary Tuberculosis

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ABSTRACT

Pulmonary tuberculosis (PTB) continues to be a major global health concern, particularly in high-burden countries like India, despite advancements in treatment. India carries the largest share of this burden, contributing to over one-fourth of all new cases each year. This makes it crucial to have strong measures in place to prevent and control the spread of the disease. Pulmonary rehabilitation (PR) has been beneficial for certain chronic lung diseases, improving lung function, exercise endurance and QoL. The study aimed to assess the knowledge, attitude, practice regarding pulmonary rehabilitation, determine the correlation between knowledge, attitude, practice regarding pulmonary rehabilitation, find out the association between the knowledge, attitude, practice regarding pulmonary rehabilitation among patients with pulmonary tuberculosis with selected demographic variables. Totally 108 samples were randomly selected for this descriptive study. The study findings are more than half of the patients had inadequate knowledge (57.4%) and poor practices (58.3%) on pulmonary rehabilitation. Poor positive correlation between knowledge, attitude and practice on pulmonary rehabilitation. Sociodemographic variables marital status, socioeconomic status, and age all significantly influence the knowledge, attitude and practice on pulmonary rehabilitation. The study concluded that there is a gap in patient knowledge and practice when it comes to pulmonary tuberculosis. The study highlights the positive ripple effect that improving knowledge can have on a patient's attitude and practice.

KEYWORDS: Tuberculosis, Knowledge, Attitude, Practice

How to Cite: Packialakshmi. K, Hema. V. H, C.V. Senthil Nathan, S. Yayathee, (2025) Knowledge, Attitude And Practice Regarding Pulmonary Rehabilitation Among The Patients With Pulmonary Tuberculosis, Vascular and Endovascular Review, Vol.8, No.6s, 52-56.

INTRODUCTION

Pulmonary tuberculosis (PTB) continues to be a major global health concern, particularly in high-burden countries like India, despite advancements in treatment. While effective anti-tuberculosis therapy (ATT) is crucial for microbiological cure, many patients are left with long-term respiratory abnormalities known as post-tuberculosis lung disease (P-TBLD) [1].

Tuberculosis (TB) continues to be a serious global health problem, affecting about 10 million people and causing 1.4 million deaths in 2019 alone [3].

India carries the largest share of this burden, contributing to over one-fourth of all new cases each year. This makes it crucial to have strong measures in place to prevent and control the spread of the disease. Tuberculosis (TB) is a preventable and usually curable disease. Without treatment, the death rate from TB disease is high (close to 50%). With treatments currently recommended by WHO (a course of anti-TB drugs for 4–6 months), about 85% of people with TB can be cured. Regimens of 1–6 months are available to treat TB infection [4].

These sequelae can cause significant lung damage, including fibrosis and obstruction, leading to symptoms such as chronic cough, shortness of breath, and reduced exercise tolerance. This impaired lung function and persistent symptoms severely diminish patients' quality of life and limit their capacity for daily activities, contributing to a substantial socioeconomic burden. [1,2,6]

Pulmonary rehabilitation (PR) has emerged as an effective, evidence-based intervention for managing chronic respiratory diseases, improving patient outcomes related to exercise capacity, symptoms, and overall quality of life. A multidisciplinary program, PR includes components such as exercise training, education, and nutritional and psychosocial support. While PR has been extensively studied and proven beneficial for conditions like tuberculosis, its role and implementation in the context of post-TB sequelae have received comparatively less attention, particularly in resource-limited settings. [1,2,5]

Pulmonary rehabilitation (PR) has been beneficial for certain chronic lung diseases, improving lung function, exercise endurance and QoL. It may also apply to people with PTLD. [4]. While the benefits of PR for post-TB patients are recognized, a significant knowledge gap exists regarding the specific perceptions of the patient. The success of any rehabilitation program is highly dependent on patient engagement, adherence, and willingness to participate. However, factors such as lack of awareness, misconceptions, and socioeconomic constraints pose significant barriers to accessing and completing PR programs. Studies focused on patients' knowledge, attitudes, and practices (KAP) regarding general tuberculosis have revealed a need for improved health education. However, specific information on the KAP related to pulmonary rehabilitation among PTB patients is lacking. Understanding these factors is critical for developing and implementing effective, patient-centered rehabilitation strategies [1,2,5]

OBJECTIVES:

- To assess the knowledge, attitude, practice regarding pulmonary rehabilitation
- To determine the correlation between knowledge, attitude, practice regarding pulmonary rehabilitation
- To find out the association between the knowledge, attitude, practice regarding pulmonary rehabilitation among patients with pulmonary tuberculosis with selected demographic variables

MATERIALS AND METHODS:

Study Design

This study employed a descriptive design aimed to assessing the knowledge, attitude, practice regarding pulmonary rehabilitation.

Setting

The study was conducted at Government Hospital, Avadi located in Thiruvallur District, Tamilnadu, India. This multispecialty hospital offers a wide array of healthcare services, making it an ideal setting for a study of this nature.

Study Duration

The study was carried out over a period of three months, from March 2025 to June 2025. This duration was chosen to allow sufficient time for participant recruitment, data collection, and analysis.

Sample Size Calculation

The sample size was determined using the formula for descriptive or prevalence studies:

$$n = \frac{(P_1Q_1 + P_2Q_2)(Z_\alpha + Z_\beta)^2}{(P_1 - P_2)^2}$$

Based on sample size calculation, it is estimated to have 98 samples, among which 10% of dropouts was expected in this study. Therefore, the final sample size will be 108.

Inclusion Criteria

Patients diagnosed with TB who met the following criteria were included in the study:

- A confirmed diagnosis of Pulmonary tuberculosis.
- Willingness to participate in the study and provide informed consent.
- Age between 18 to 65 years.
- Who are on the Anti Tubercular Treatment for at least one month

Exclusion Criteria

Patients were excluded from the study if they met any of the following criteria:

- A history of comorbid illnesses such as AIDS.
- Being critically ill and unable to participate in the study.
- Inability to follow instructions or complete the questionnaire due to neurological or psychiatric problems.

Study Plan

Ethical Approval and Clearance

The study received clearance from the Institutional Ethical Committee of ACS Medical College and Hospital (No. 897/2023/IEC/ACSMCH, dated 05.09.2023). Following the ethical clearance, permission was obtained from the Additional Director of Medical and Rural Health Services, State TB Officer, NTEP, DMS, (Letter No. 385/SHS-NTEP/Research Project/2023, dated 17.07.2023) and Deputy Director of Medical Services (TB), District TB Centre, Thiruvallur and Chief Medical Officer, Government Hospital, Avadi.

Sampling and Data Collection

A total of 108 participants were selected for the study using a purposive random sampling technique. The participants were patients diagnosed with pulmonary TB who met the inclusion criteria. Data were collected using the structured questionnaire on Knowledge, 5-point likert scale on Attitude and Practice. The tool was translated into the local language to ensure clarity and to retain the original meaning, making it easier for participants to comprehend the questions.

Participants responded to a series of questions using the instrument consists of 10 multiple choice questions to assess the knowledge. Each correct answer carries "1" whereas "0" for wrong answer. Attitude was assessed by 5-point Likert scale. Totally 10 questions. The scoring ranges from 1 to 5 [Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), strongly Agree (5)]. Total score was 50. Practice was assessed by 5-point Likert scale. Totally 10 questions. The scoring ranges from 1 to 5 [Never (1), Rarely (2), Sometimes (3), Often (4), Always (5)]. Total score was 50. The study tool utilized a pre-designed questionnaire, which was reviewed and validated by a team of pulmonologists and nursing professionals.

Data Analysis

The data collected through the Tool were analysed using appropriate statistical methods to assess knowledge, attitude, practice regarding pulmonary rehabilitation among the patients with pulmonary tuberculosis. Descriptive statistics, including frequencies and percentages, were used to summarize the data, while inferential statistics were applied to explore the relationships between knowledge, attitude, practice and other variables such as age, gender, and type of TB.

RESULT

Frequency and percentage distribution of demographic variables of patients with pulmonary rehabilitation.

Most of the patients with pulmonary rehabilitation, 34(31.5%) were aged between 46 – 55 years, 81(75%) were male, 77(71.3%) were married, 58(53.7%) belonged to upper middle class (II), 56(51.9%) were residing in urban area, 95(88%) belonged to nuclear family, 91(84.3%) had 2 – 5 family members, 36(33.3%) had the habit of smoking, 48(44.4%) consumed alcohol, 31(28.7%) had the habit of smoking and consume alcohol, 12(11.1%) had other type of habits such as tobacco, betal chewing etc, and 5(4.6%) had all the above mentioned habits.

Table 1: Frequency and percentage distribution of level of knowledge regarding pulmonary rehabilitation among patients with pulmonary rehabilitation.

N = 108

Level of Knowledge	Frequency	Percentage
Inadequate (≤50%)	62	57.4
Moderately adequate (51 – 75%)	39	36.1
Adequate (>75%)	7	6.5

Frequency and percentage distribution of level of attitude regarding pulmonary rehabilitation among patients with pulmonary rehabilitation

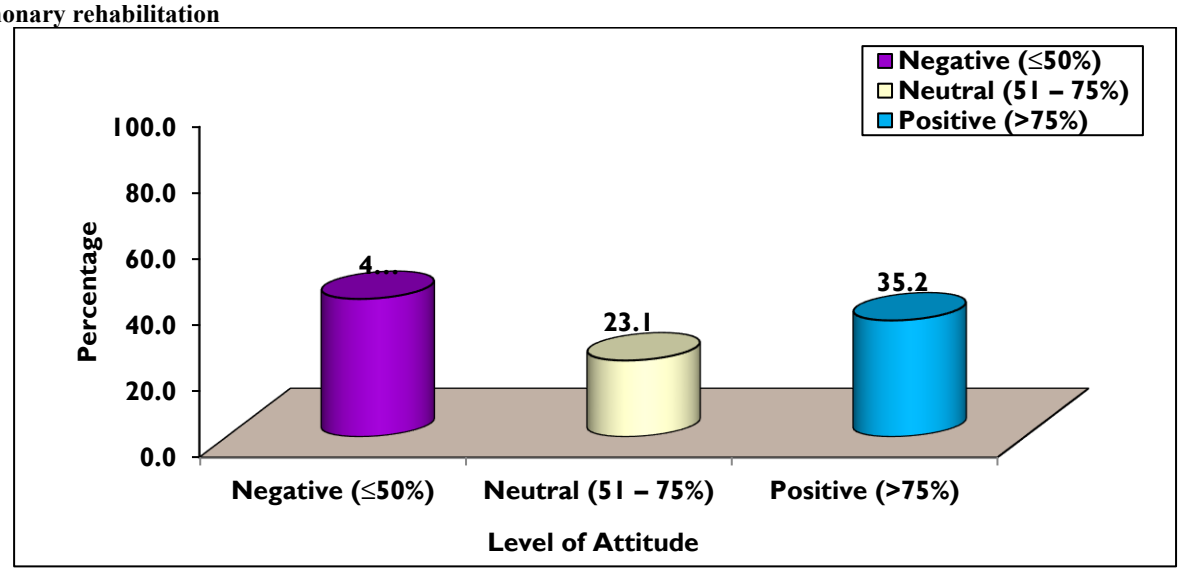

Fig 1: Percentage distribution of level of attitude regarding pulmonary rehabilitation among patients with pulmonary rehabilitation

The figure 1 depicts that among the patients with pulmonary rehabilitation, 45(41.7%) had negative attitude regarding pulmonary rehabilitation, 38(35.2%) had positive attitude and 25(23.1%) were neutral regarding pulmonary rehabilitation.

Table 2: Frequency and percentage distribution of level of practice regarding pulmonary rehabilitation among patients with pulmonary rehabilitation.

N = 108

Level of Practice	Frequency	Percentage
Poor (≤50%)	63	58.3
Moderate (51 – 75%)	39	36.1
Good (>75%)	6	5.6

The table 2 illustrates that among the patients with pulmonary rehabilitation, 63(58.3%) had poor practice regarding pulmonary rehabilitation, 39(36.1%) had moderate practice and 6(5.6%) had good practice regarding pulmonary rehabilitation.

Table 3: Correlation between knowledge, attitude and practice regarding pulmonary rehabilitation among patients with pulmonary rehabilitation.
N = 108

Variables	Mean	S.D	Karl Pearson's Correlation "r" & p-value
Knowledge	5.01	1.74	**r = 0.279**
Attitude	32.17	7.53	**p=0.003, S****
Knowledge	5.01	1.74	**r = 0.215**
Practice	28.17	5.44	**p=0.025, S***
Attitude	32.17	7.53	**r = 0.444**
Practice	28.17	5.44	**p=0.0001, S*****

***p<0.001, **p<0.01, *p<0.05, S – Significant

The table 3 indicated that the mean score of knowledge was 5.01±1.74, attitude 32.17±7.53 and practice 28.17±5.44.

The calculated Karl Pearson's Correlation value of r = 0.279 shows a poor positive correlation between knowledge and attitude statistically significant at p<0.01 level.

The calculated Karl Pearson's Correlation value of r = 0.215 shows a poor positive correlation between knowledge and practice statistically significant at p<0.05 level.

The calculated Karl Pearson's Correlation value of r = 0.444 shows a mild positive correlation between knowledge and practice statistically significant at p<0.001 level.

Association of level of knowledge, attitude and Practice regarding pulmonary rehabilitation among patients with pulmonary rehabilitation with their selected demographic variables.

The demographic variables marital status **(χ^2=15.718, p=0.015)**, and socio-economic status **(χ^2=17.717, p=0.023)** had statistically significant association with level of knowledge regarding pulmonary rehabilitation among patients with pulmonary rehabilitation at p<0.05 level.

The demographic variables marital status **(χ^2=12.646, p=0.049)** and alcohol consumption **(χ^2=6.074, p=0.048)** had statistically significant association with level of attitude regarding pulmonary rehabilitation among patients with pulmonary rehabilitation at p<0.05 level.

The demographic variables age **(χ^2=16.510, p=0.036)** and marital status **(χ^2=16.510, p=0.011)** had statistically significant association with level of practice regarding pulmonary rehabilitation among patients with pulmonary rehabilitation at p<0.05 level.

DISCUSSION

The study's findings on pulmonary tuberculosis (PTB) patients reveal that a significant number of patients have a poor knowledge, which leads to poor treatment adherence. This is a major hurdle in treating the disease successfully. The analysis also shows that a patient's socio demographic data like their marital status, age, and socioeconomic background, are strongly associated with knowledge, attitude, and behavior on pulmonary rehabilitation.

Knowledge, Attitude, and Practice on pulmonary rehabilitation:

The study found that more than half of the patients had inadequate knowledge (57.4%) and poor practices (58.3%) on pulmonary rehabilitation. This study findings are supported with research by Sonawane N.S (2019) in India found that small percentage of PTB patients had adequate knowledge, practice and attitude on pulmonary rehabilitation. [7].

Ethiopia study on systematic review found that the pooled prevalence of non-adherence to TB treatment was 21.3% by Nezenega, Z. S (2024). [8].

Correlation between Knowledge, Attitude, and Practice

This study identified a clear and statistically significant positive link between a patient's knowledge, attitude, and practice (p. 6). In simple terms, this means that as patients learn more about their condition, they tend to develop a more positive attitude, and this, in turn, helps them to better adhere to their treatment plan. This connection is well-supported by other research on TB. A study in Nepal, for instance, showed a strong correlation between a patient's knowledge and their adherence to treatment. This highlights that simply educating patients is a foundational step toward changing their behavior for the better. The study findings are supported by Zhang Y., et.al., (2024), that Knowledge was positively correlated with attitude ($r = 0.223, p < 0.001$) and practice ($r = 0.539, p < 0.001$), and attitude was positively correlated with practice ($r = 0.379, p < 0.001$) [9]

Association of Knowledge, attitude and practice with demographic variables

The study found that a patient's marital status, socioeconomic status, and age all significantly influence the pulmonary rehabilitation.

The demographic variable marital status had statistically significant association on knowledge, attitude and practice on pulmonary rehabilitation. Socioeconomic status had statistically significant association with level of knowledge regarding pulmonary rehabilitation. alcohol consumption had statistically significant association with level of attitude. age and marital status had statistically significant association with level of practice. The findings are supported by Mariam Lakara., et.al., (2025) [10].

CONCLUSION

The findings of this study concluded that there is a gap in patient knowledge and practice when it comes to pulmonary tuberculosis. The study highlights the positive ripple effect that improving knowledge can have on a patient's attitude and practice. It also reminds that we cannot ignore the personal and social circumstances of patients, as these can be major barriers to recovery.

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