

### A RETROSPECTIVE STUDY ON THE HEALTH-RELATED QUALITY OF LIFE IN POST TUBERCULAR PATIENTS USING SEQUENTIAL PHYSICAL CHECK-UP AND IMAGING METHODS PERIODICALLY

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**Abstract**

**Background:** Pulmonary Tuberculosis (TB) is a widespread infectious chronic lung disease especially in Endemic region like India which is one of the leading causes of mortality, particularly residing in low socio-economic status and poor hygiene condition. In spite of 3 decades of launching Revised National Tubercular Control Programme (1997 to 2020), still Tuberculosis is most common infection in India which causes significant morbidity and mortality even after completion of treatment of tuberculosis which affects quality of life of patients. The radiological modalities and physical check-up periodically are widely used in evaluation of any residual pulmonary /pleural disease and Quality of life. The aim of present study is to assess Quality of Life in patients who have completed the 9 months course of treatment of pulmonary tuberculosis. **Materials and Methods:** It was a cross-sectional study of 220 patients who were enrolled in the study. The study participants were the individuals who had been suffering from pulmonary tuberculosis and declared cured after completing treatment for tuberculosis. The inclusion Criteria were Age group of 14-60 years, who were able to perform lung function test using Spirometry, while the exclusion criteria were the patients with active pulmonary tuberculosis and MDR-TB and patients with history of heavy smoking in past or present. **Result:** Total 220 patients who fulfilled the inclusion criteria were enrolled into the study. The mean age of the patients was 27.22. The number of Male patients were 130 (59.09%) and females were 90 (40.90%). Among the enrolled patients, majority of Patients were resided in the rural areas 173 (79%) as compared living in urban areas 47 (21%). The Mean BMI of the patients in the study was 18.66. 60 patients had a normal BMI and 157 patients were underweight. Majority of patients were smokers 114 as compared to non-smokers 106. The number of patients consuming Alcohol were 68 while non – alcoholics were 152 in numbers. The mean time taken to start treatment was 33.73 days ± 27.8 (7 - 180) with Interquartile Range 15. **Conclusion:** It was concluded that patients who had suffered from pulmonary tuberculosis have poor quality of life scores. Health related quality of life scores (Saint George’s Respiratory Questionnaire) had good correlation with chest X-ray/C.T. Scan Chest findings and spirometric analysis. Thus, all post pulmonary tuberculosis patients should undergo pulmonary rehabilitation with routine follow-up and Pulmonologist’s consultation for leading better quality of life.

**INTRODUCTION**

Tuberculosis is one of the most common global infection leading to significant level of morbidity and mortality Pulmonary Tuberculosis (TB), an

Infectious chronic lung disease is a global health problem caused by bacteria known as Mycobacterium Tuberculosis and is second leading infectious cause.

India accounts for one fourth of global TB burden i.e. 2.2 million out of 9.6 million new cases

annually. In India, 26% of total TB cases recorded worldwide in 2012 and the prevalence rate of infection with Tuberculosis was 40 % approximately. As per guidelines of T.B. Control in the year 2016, every day more than 6000 persons develop Tubercular disease and more than 600 people die of TB (i.e. 2 death every 5 minutes) in India.<sup>[1]</sup>

In the year 1993, the Revised National TB Control Programme was started as pilot project in 5 states which was launched as National Programme in 1997. Though T.B can involve any organ system but manifestations are usually related to chest. The Lungs are most common and often initial site of involvement.

The role of imaging is utilized in diagnosis, treatment evaluation about response assessment and residual activity. The most important post tuberculosis role is to detect of disease complications and sequelae.<sup>[2]</sup>

**Table: Indications of Chest Radiograph and CT scan.<sup>[3]</sup> Evaluation of patients suspected to have TB**

X-Ray Chest	C.T. Scan Chest
Patients with unexplained cough and expectoration	In equivocal chest x-ray
In sputum negative patient	In equivocal clinical Profile
Patients with unexplained fever, loss of appetite	For disease Assessment
Patient suspected of extra-thoracic TB	For disease activity in persistent lesions
After completion of intensive phase & Treatment response	Radiographic worsening
After completion of treatment	Imaging of suspected TB complications
After any intervention (chest tube)	Equivocal CXR in absence of clinical response
Symptomatic patients with past H/o T.B.	

Post Tubercular lung Diseases (PTLD) are heterogeneous in nature and categorized into parenchymal, affecting the airways, pleural and pulmonary/chest wall & vascular compartment. The Imaging findings play an important role in evaluation of chest TB patients and C.T. Scan is more sensitive than chest x –ray in this regard.<sup>[4]</sup>

**Table: clinical patterns of Post Tubercular Lung Disease**

Compartment	Clinical patterns
Airways	-Post tubercular obstructive lung disease -Bronchiectasis
Mediastinal	Lymphadenopathy
Parenchyma	-Cavitation -Parenchymal destruction -Fibrosis, C.O.P.D. -Aspergilloma
Pleural	Pleural thickening/ pleural effusion
Pulmonary vascular	PAH and core pulmonale

Other radiological methods for evaluation of any residual disease in post tubercular patients.<sup>[5]</sup> Ultrasound Chest is very useful in detection of any residual pleural effusion or pleural thickening, Ultrasound guided drainage of residual pleural fluid

and follow up, also to evaluate hepato-splenomegaly, Ascites, abdominal Lymphadenopathy to rule out concomitant Abdominal Tuberculosis.

C.T. Scan chest is very useful in detection of residual occult disease, evaluation of mediastinal active lymph nodes, assessing any residual disease like non healed cavities, fibrotic activity, tree in bud appearance, evaluating any complications and sequelae like bronchiaectasis, empyema, fungal balls, extra-pulmonary Tuberculosis and bone tuberculosis.<sup>[6]</sup>

Magnetic Resonance imaging is a problem-solving modality in evaluation of presence of diffusion restriction in lymph nodes with peripheral enhancement suggestive of active disease, presence of caseation and pleural abnormalities.

Positron Emission Tomography –CT is playing an important role in work up of cases of tuberculosis and still persisting symptoms of pyrexia of unknown origin and cough and to rule out remote possibility of malignancy.

Post Primary Tuberculosis (PPT) is characterized by Liquefaction of caseous necrosis, formation of cavities, progressive fibrosis, lung destruction and bronchogenic spread, we must evaluate for any such type of findings in follow up CXR/C.T. Scan Chest.<sup>[7]</sup> Prospective data on the long-term outcomes of Post tubercular lung disease remains limited, and no validated prognostic score are yet available. However, cross-sectional data from tuberculosis survivors suggest a high prevalence of chronic respiratory symptoms even years after treatment completion including breathlessness and chronic cough. Patients with extensive PTLT and destroy lung tissue experience high rates of hospitalization, reduced Quality of Life and respiratory related mortality.<sup>[8]</sup>

Several previous studies have showed HRQoL varies among TB patients at different stages of treatment and is significantly worse than HRQoL among the general population at all stages of treatment.

The use of Pre-Coded Questionnaire (SGRQ) in the evaluation of such patients is a much more recent development. although patients with active TB when compared to a normal population, the evidence suggests that active TB is associated with a lower health status than found in subjects without Tuberculosis.<sup>[9,10]</sup>

## MATERIALS AND METHODS

It was a cross-sectional study. The study participants are individuals who have been suffering from tuberculosis and have been declared cured after completing DOTS regimen under RNTCP.

Study Population: The 220 residents of Pilkhuwa, District Hapur, U.P.

### Inclusion Criteria

Age group of 14-60 years, who are able to perform spirometry, who had successfully completed treatment and have been declared cured.

### Exclusion Criteria:

Exclusion criteria was patients with active pulmonary tuberculosis and MDR-TB and patients with history of heavy smoking in past or present.

**Sample Size:** The study was conducted from January 2021 to December 2021. Sample size of 220 subjects was obtained from the Medical record Department of our Institution.

Consecutive sample technique was used in this study. All those patients who have suffered from pulmonary tuberculosis and have been declared cured in the past five years were referred from various district health Centers to CHEST and T.B. Department of G.S. Medical College and Hospitals, Pilkhuwa, District Hapur, U.P. Informed consent is taken from each patient.

Pre-coded questionnaire to collect data on the demographic characteristics were used. Hindi version of St. Georges Respiratory Questionnaire [SGRQ] was used to assess the quality of life.

### The Quality of life in Post –Tubercular Phase is studied in 8 Domains which are summarized as: -

Physical Functioning, Role Physical, Bodily Pain, General Health and Vitality, Social Functioning .Role Emotional and Mental Health.

The Health Status is measured through Five Dimensions like Mobility, Self-Care, Usual Activities, Pain and Discomfort, Anxiety and Depression.

In India, 30% of TB Patients had persistent respiratory symptoms even 14 to 18 years after completion of TB treatment.

### Statistical Analysis

Significance of variables was assessed using p-value and p-value of less than 0.05 was considered to be

statistically significant. All the data were analysed using chi-square, ANOVA and unpaired 't' test using SPSS Software 22.

## RESULTS

There were 220 patients who fulfilled the inclusion criteria and were enrolled into the study. The mean age of the patients was 27.22. The Male patients were 130 (59.09%) and females were 90 (40.90%). Among the enrolled patients, majority of them resided in the rural areas 173 (79%) as compared to 47 (21%) in urban areas.

Mean BMI of the patients in the study 18.66. Out of 220patients, 60 had a normal BMI and 157 patients were detected underweight.

Majority of patients were smokers (114), as compared to Non-smokers (106). Similarly, majority of the patients were non-alcoholic. The mean time taken to start treatment was  $33.73 \pm 27.8$  days (7 - 180) with IQR 15.

In this study, chest x-ray was graded from I to III with Degree I representing minimal changes, Degree II as mild findings and Degree III with moderate to severe findings. Majority of patients were categorized into Degree I (49.09%) followed by Degree II (32.72%) and Degree III (18.18%).

**Table 1: Characteristics of the Patients who were investigated**

Age	27.22
Male %	130 (59.09)
Female %	90 (40.90)
BMI	18.66
Underweight	157
Normal	60
Overweight	2
Obese	1
Chest X-Ray Grading	
Degree I	108 (49.09)
Degree II	72 (32.72)
Degree III	40 (18.18)

**Table 2: Distribution Characteristics and Reliability Estimates SGRQ Scales in the Study Population.**

	Symptoms	Activity	Impact	Overall
Mean observed values	22.10	33.10	19.40	23.00
SD	22.65	33.40	22.40	23.20

**Table 3: Mean SGRQ Scale Scores by Demographic and Clinical Characteristics of the Study Population**

		Symptom	Activity	Impact	Over all
Mean Normal Value		12	9	2	6
Sex	Male	23.10±23.10	33.57±34.10	20.10±23.57	24.40±24.14
	Female	21.38±21.89	32.20±32.50	18.40±20.32	22.90±2.65
	P value	0.40	0.68	0.43	0.51
Chest Radiography	I	12.60±17.30	15.25±24.35	9.40±15.50	11.40±16.04
	II	28.20±22.10	41.80±31.58	23.52±22.10	29.60±22.10
	III	38.10±23.10	64.10±27.10	38.33±23.56	46.10±21.49
	P Value	0.0	0.0	0.0	0.0
FEV1%	<80	28.26±23.56	42.52±33.20	24.70±23.60	30.43±23.68
	>80	10.83±15.35	14.08±23.10	8.80±13.27	10.64±16.10
	P Value	0.0	0.03	0.0	0.0
PFT Diagnosis	Normal	10.56±15.50	10.55±20.17	6.61±11.65	8.42±13.28
	Obstruction	20.90±19.20	43.46±30.56	24.10±20.18	29.40±20.58
	Restriction	26.15±22.56	36.10±31.20	21.60±21.56	26.15±21.80

	Mixed	36.80±23.48	60.34±30.10	34.65±26.32	42.67±24.10
	P Value	0.0	0.0	0.0	0.0

**Table 4: Correlation between Gender and Pulmonary Functions**

PFT Diagnosis	Sex		Total	P Value
Normal	47	29	76	0.00
Obstructive disease	14	9	23	
Restricted disease	34	43	77	
Mixed disease	32	12	44	
Total	127	93	220	

## DISCUSSION

The Pre coded questionnaire (SGRQ) under 8 domains were used in our study to assess the general Quality of Life in Post TB affected patients. This method demonstrated good reliability, validity and responsiveness as a quality of life status.<sup>[11]</sup>

Our findings in a study suggests that it need to improve TB related quality of life which includes dissatisfaction with one's self and relationship with friends and family members & affected significantly by TB related distress, stigma and isolation.

The 8 Domains used for QOL were based on Health rate, Energy, Daily Activities, Living Life Style, Self-Status, Relationships, Financial status, Living Place and Global Quality of life. Each domain was scored from 0 to 4, and Total Global Quality of Life scores were ranged from 0 to 32, out of which 0 was very dissatisfied, 8 was dissatisfied, 16 was neither satisfied nor dissatisfied, 24 as satisfied and 32 considered as very satisfied.

In many TB patients, there were rejections even by family members and friends & even loss of jobs. Such discrimination further lead into Anxiety, Depression, Isolation and finally Reduced Quality of Life.

Pulmonary Tuberculosis has substantial adverse impacts on patient's quality of life. Patient's perceived HRQoL is decreased in all Patients diagnosed with PTB. While HRQoL improves as pharmacological treatment progress. The perception of both mental and physical quality of life remains low as compared to normal population.

Chakaya et al observed that during the treatment of active PTB, lung function impairment is usually restrictive in nature. This may persist or develop into an obstructive pattern.

The reduced exercise capacity and pulmonary functions were regarded as sequelae of disease.

Longitudinal cohort studies reported that during Tuberculosis treatment improvements in mental health took much time in mental health as compared to physical symptoms.

In a study conducted at Pakistan showed that 80% of post TB patients were found under depression, particularly residing in low socioeconomic status and developed fear complex and feel isolated,

Chamla and Guo et.al found older people tended to have poor HRQoL than younger ones.<sup>[12]</sup> Duyan et al found better HRQoL was correlated with Higher income, Higher education, better housing conditions,

better social security and closer relationships with family members and friends.<sup>[13]</sup>

Yang et.al. and Nyamathi et.al observed that Females were more likely to report poorer health than Males, especially on mental health problems, such as depression and anxiety.

In another study, the Quality of life improved after completion of regular six months course treatment gradually but final quality of life scores at the end of treatment was found to be lower as compared to normal population. We also recommend socioeconomic support and Rehabilitation for further increase the likelihood of success of treatment. There was 99% reduction in concentration of bacteria and cough frequency more than halves after 2 weeks of regular treatment.

The 6-minute walk distance (6MWD) is advisable to post TB patients for increasing functional capacity, improve lung function efficiency.

## CONCLUSION

From the present study, The Health-Related Quality of Life among TB patients within 2 years after completion of DOTs indicated the effectiveness in quality of life of patients who have suffered from pulmonary tuberculosis revealed poor quality of life scores. Health related quality of life scores (SGRQ) had good correlation with chest x-ray/C.T.Scan findings and spirometric analysis. To conclude, all patients of post pulmonary tuberculosis should undergo pulmonary rehabilitation for better quality of life

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## REFERENCES

- Falzon D, Schünemann HJ, Harausz E, González-Angulo L, Lienhardt C, Jaramillo E, et al. World Health Organization treatment guidelines for drug-resistant tuberculosis, 2016 update. *Eur Respir J*. 2017;49(3):1602308. doi: 10.1183/13993003.02308-2016.

2. Ryu YJ, Lee JH, Chun EM, Chang JH, Shim SS. Clinical outcomes and prognostic factors in patients with tuberculous destroyed lung. *Int J Tuberc Lung Dis.* 2011;15(2):246-50.
3. Panda A, Bhalla AS, Sharma R, Mohan A, Sreenivas V, Kalaimannan U, et al. Correlation of chest computed tomography findings with dyspnea and lung functions in post-tubercular sequelae. *Lung India.* 2016;33(6):592-599. doi: 10.4103/0970-2113.192871.
4. Manji M, Shayo G, Mamuya S, Mpembeni R, Jusabani A, Mugusi F. Lung functions among patients with pulmonary tuberculosis in Dar es Salaam - a cross-sectional study. *BMC Pulm Med.* 2016;16(1):58. doi: 10.1186/s12890-016-0213-5.
5. Rhee CK, Yoo KH, Lee JH, Park MJ, Kim WJ, Park YB, et al. Clinical characteristics of patients with tuberculosis-destroyed lung. *Int J Tuberc Lung Dis.* 2013;17(1):67-75. doi: 10.5588/ijtld.12.0351.
6. Di Naso FC, Pereira JS, Schuh SJ, Unis G. Functional evaluation in patients with pulmonary tuberculosis sequelae. *Rev Port Pneumol.* 2011;17(5):216-21. Portuguese. doi: 10.1016/j.rppneu.2011.06.010.
7. Kastien-Hilka T, Rosenkranz B, Sinanovic E, Bennett B, Schwenkglenks M. Health-related quality of life in South African patients with pulmonary tuberculosis. *PLoS One.* 2017;12(4):e0174605. doi: 10.1371/journal.pone.0174605.
8. Visca D, Zampogna E, Sotgiu G, Centis R, Sadari L, D'Ambrosio L, et al. Pulmonary rehabilitation is effective in patients with tuberculosis pulmonary sequelae. *Eur Respir J.* 2019;53(3):1802184. doi: 10.1183/13993003.02184-2018.
9. Bhalla AS, Goyal A, Guleria R, Gupta AK. Chest tuberculosis: Radiological review and imaging recommendations. *Indian J Radiol Imaging.* 2015;25(3):213-25. doi: 10.4103/0971-3026.161431.
10. Bhalla AS, Goyal A, Guleria R, Gupta AK. Chest tuberculosis: Radiological review and imaging recommendations. *Indian J Radiol Imaging.* 2015;25(3):213-25. doi: 10.4103/0971-3026.161431.
11. Guo N, Marra F, Marra CA. Measuring health-related quality of life in tuberculosis: a systematic review. *Health Qual Life Outcomes.* 2009;7:14. doi: 10.1186/1477-7525-7-14.
12. Chamla D. The assessment of patients' health-related quality of life during tuberculosis treatment in Wuhan, China. *Int J Tuberc Lung Dis.* 2004;8(9):1100-6.
13. Duyan V, Kurt B, Aktas Z, Duyan GC, Kulkul DO. Relationship between quality of life and characteristics of patients hospitalised with tuberculosis. *Int J Tuberc Lung Dis.* 2005;9(12):1361-6.