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Research Article

Understanding Quality of Life of Patient with Tuberculosis: Findings from Andaman and Nicobar Islands, India

S. Senthil[1-3]* and G. Kanaga[4]

[1]Ph.D. Scholar (Social Work), [4]Professor & Dean, Department of Social Work, Cauvery College for Women (Autonomous), affiliated to Bharathidasan University, Tiruchirappalli-620018, Tamil Nadu, India
[2]ICMR–Regional Medical Research Centre, Andaman and Nicobar Islands, Union Territory, India
[3]Department of Social and Behavioural Research, ICMR-National Institute for Research in Tuberculosis, Chennai, Tamil Nadu, India

***Corresponding Author**
senthilsel@gmail.com

All around the world, tuberculosis (TB) is still a serious public health issue. Finding out the quality of life (QoL) of tuberculosis patients in the Andaman and Nicobar Islands is the main goal of this paper. This cross-sectional study was conducted from July 2021 to December 2022 in seven tuberculosis units. The quality of life (QoL) was assessed using the EQ-5D-5L scale. We used descriptive statistics, logistic regression, and the chi-square test. Pulmonary TB was more common among males. More than half belonged to middle socioeconomic status. Pulmonary TB was higher among males at 70%, whereas extra pulmonary TB was higher among females at 60%. Multivariate regression shows that the age group 46-55 (OR=0.1; 95% CI 0.0-0.5; p<0.01) was less predictive of higher QoL compared to patients aged 18-35 years. Patients with depression had a lower probability of having a higher quality of life (OR=0.1; 95% CI 0.0-0.2; p<0.01) when compared to non-smokers and those who had not experienced depression. This study provides valuable insights into the intricate interplay between alcohol use, demographic factors, and the QoL among TB patients.

Keywords
Quality of life, tuberculosis, smoking, alcohol, islands

INTRODUCTION

Tuberculosis (TB) affects more than 10 million people annually and leads to approximately 1.5 million deaths globally (WHO, 2021). It's a paradox that while TB is a preventable and completely curable disease, millions of people still die due to this disease, especially in low- and middle-income countries (LMICs). While TB creates significant morbidity and leads to increased mortality, it also leads to significant psycho-social and economic consequences (Hargreaves et al., 2011). TB continues to be a serious global public health issue. Evaluation of the health-related quality of life (QoL) that tuberculosis (TB) patients experience has received more attention in recent years. The affected person's capacity to carry out daily tasks is restricted, and it has a major negative influence on their social, mental, and physical health.

Although there has been a successful treatment for tuberculosis (TB) for a substantial amount of time, 30% of the world's population still has the infection. Individuals with tuberculosis reported severe deterioration in their physical and mental health-related quality of life (Yasobant et al., 2022; Aggarwal, 2019). Usually, four medications are used in combination during the first phase of treatment, which lasts at least six months (Grace et al., 2019; WHO, 2008). In order to meet the medical and psychological needs of patients with tuberculosis, treatment guidelines suggest the use of a patient-centered approach (Myburgh et al., 2023). Treatment for latent

tuberculosis infection (LTBI) is widely available in high-income countries. Typically, this treatment entails taking isoniazid (INH) once a day for nine months; however, drug intolerance and inconvenient treatment and clinic visit schedules can make the completion of treatment difficult (Huaman & Sterling, 2019; Shim, 2014). While the impact of TB has been measured in terms of diagnostic and treatment parameters, there is an emphasis on measuring the QoL of TB patients. In this context, research in the past has underscored the importance of measuring QoL to assess the population-level impact in terms of well-being and productivity (Salehitali et al., 2019; Atif et al., 2014).

Considerable research undertaken to assess the QoL among persons with TB in India and other high-burden countries has shown that QoL has been negatively impacted among persons with TB in general. But still, there is a lack of research on the QoL among TB patients living in resource-poor, geographically remote, and hard-to-reach terrains in India. Generalizing QoL measures of TB patients living in urban and rural areas in mainland India could be different from island places like Andaman and Nicobar, where the socio-cultural and geographical factors are unique and different from mainland India (Aggarwal, 2019). There is no information on the factors associated with QoL among persons with TB in island settings. Many diseases are associated with psychological distress, which is becoming more widely acknowledged in clinical settings due to its impact on quality of life. Positive results have been obtained in many medical conditions with psychological interventions and their impact on the treatment outcome. A disease that kills millions of people worldwide is tuberculosis. But therapies to enhance treatment outcomes and the impact of tuberculosis on patients' psychological states are often overlooked, particularly in developing and undeveloped countries.

MATERIALS AND METHODS

Setting

The research was carried out in the Andaman and Nicobar Islands, an archipelago situated 1,200 kilometres from the Indian mainland in the Bay of Bengal. Spanning latitudes 6°–14° north and longitudes 92°–94° east, these islands, a Union Territory, are home to more than 3,000,000 people from six indigenous tribes (Down to Earth, 2021). The National Health Mission (NHM) funds the National Tuberculosis Elimination Program (NTEP), which provides free TB treatment and management services. The study focused on nine Designated Microscopic Centres (DMCs), diagnosing 450 to 480 smear-positive cases annually and implementing TB treatment through Community Health Centres (CHCs) and Primary Health Centres (PHCs) over a six- to eight-month period.

Study Area

Seven Tuberculosis Units (TUs) from diverse locations within the Andaman and Nicobar Islands participated, including urban (Port Blair), tribal (Car Nicobar), and rural areas (Ferrargunj, Little Andaman, Rangat, Mayabunder, and Diglipur). The study exclusively examined the government health system, encompassing Health and Wellness Centres (HWCs), Community Health Centres (CHCs), Urban Health Centres (UHCs), and Primary Health Centres (PHCs).

Study Population

The study included newly diagnosed patients with pulmonary and extra-pulmonary tuberculosis registered for treatment under the Union Territory's NTEP between July 2021 and December 2022. Eligible participants were tuberculosis patients aged 18 years and above, both male and female. Chronically ill, HIV-positive individuals and older patients were excluded from participation.

Instruments for Data Collection

Data were collected through a semi-structured pre-coded interview schedule. This interview covered patient demographic details such as gender, age, level of education, profession, marital status, type of family, and habits like alcohol use and smoking. To measure the quality of life, we employed the EQ-5D-5L scale developed by the EuroQol Group. The Kuppuswamy socioeconomic status (SES) scale was also employed

to measure the socioeconomic status of the study participants.

Data Collection

Interviews were conducted by an investigator with a master's degree in social work, following written informed consent. Patients were interviewed after completing the two to three months' intensive phase of treatment at government health facilities. Confidentiality was assured, and the interviews were conducted in Hindi, which is the native language of the patients. Smoking and alcohol consumption data were cross-referenced with the patients' treatment cards.

Data Management

The data was entered into Microsoft Excel spreadsheets (MS Excel Version 10) and analyzed using SPSS version 22.0. The frequency distribution of patient profiles was examined, and factors predicting the quality of life among TB patients were identified. Descriptive statistics, chi-square tests, and logistic regression were used in the process. The adjusted odds ratio with a p-value <0.05 was taken for statistical significance.

Ethics

Ethical approval was obtained from the Institutional Ethics Committee of the ICMR-Regional Medical Research Centre in Port Blair. Necessary permission was received from the National Tuberculosis Elimination Programme, Andaman and Nicobar Islands. At the end of the interview/data collection, the TB patients received counseling and encouragement to complete their treatment. Ethical standards were maintained throughout the data collection process.

RESULTS

Demographic characteristic of Study Population

Among the total of 274 study population, 57% were male. The age group of 18-55 years old, which comprises 81% of the TB population-more economically and reproductively vulnerable group-was affected by TB, and the remaining 19% belonged to the over 55 age group. Sixty-two percent of the study population was married, and the same percentage was living under a nuclear family system. The majority (77%) of the study population had been living in the Andaman and Nicobar Islands for more than 20 years.

Socio economic Characteristic of Study Population

Only 9% were illiterate and 91% were literate. The level of education was 81% up to school level, and 10% completed college education. With respect to occupation, 30% were not working, but the remaining 70% were working (Table 1). Among the employed, 27% were working in the organized sector and 43% were working in the unorganized sector. The Kuppusamy Socio Economic Scale (SES) was used to measure the socio-economic status of the study population. It is estimated that only 1% belong to upper socio-economic status, whereas 41% belong to lower socio-economic status. The majority of the study population, that is, 58%, belong to middle socio-economic status.

Life Style Characteristics of the Study Population

In the current study, two variables such as tobacco smoking and alcohol are taken as lifestyle characteristics. Of the study population, an overall 15% were found to be tobacco smokers, and among males, it was 25%. With regard to alcohol use, 17% consumed alcohol, and among males, it was 26%.

Clinical Characteristics of the Study Population

Of the 274 study population, 61% had extra pulmonary TB and 39% had pulmonary TB. Out of the total TB patients, males constituted 57% (156), whereas females were 43% (118). Compared to females, males were found to have more pulmonary smear-positive TB (70% vs. 30%), followed by PTB smear-negative X-ray positive (69% vs. 31%). Extra pulmonary TB was found to be present among 40% of males and 60% of females. Latent TB was also found to be more common in women, with 40% among males and 60% among females.

Table 1: Socio economic characteristic of Study Population

Characteristics	Number	Percentage
Gender		
Female	118	43
Male	156	57
Age in years		
18-35 yrs.	115	42
36-45 yrs.	59	22
46-55 yrs.	47	17
More than 55 yrs.	53	19
Marital status		
Unmarried	104	38
Married	170	62
Family Type		
Nuclear	169	62
Joint	105	38
Living in Island (years)		
20 years	63	23
21-29 years	47	17
30-38 years	60	22
39-47 years	51	19
48-75 years	53	19
Education		
Illiterate	24	9
School	222	81
College	28	10
Occupation		
Not working	81	30
Organised Sector	75	27
Un Organised Sector	118	43
Socio economic Status (SES)		
Lower level	112	41
Middle Level	160	58
Upper Level	2	1
TB Type		
PTB	106	39
EPTB	168	61
Smoking		
Non Smoking	234	85
Smoking	40	15
Alcohol Use		
No alcohol use	228	83
Alcohol use	46	17
Stigma		
Not Stigma	158	58
Having Stigma	116	42
Anxiety/Depression		
No depression	140	51
Depression	134	49

Enacted Stigma

The enacted stigma was assessed by using the Van Re Stigma Scale. It was observed that 58% of the population had no stigma and 42% experienced stigma. Most of the study participants were found to have completed high school, with 31%, followed by middle and higher secondary with 17% and 14%, respectively. Only 9% of the participants had not received a formal education. Most of the study participants belonged to the age group ≤30, with 32%, followed by the >50 age group (25.5%), 31-40 (21.5%), and 41-50 (21.2%). With regard to depression, it was observed that 51% reported being depressed due to TB disease.

Factors Determining Quality of Life

Results show that patients within the 36-45 years of age group (OR = 0.4; 95% CI 0.2-0.8; p<0.01), the 46-55 years of age group (OR = 0.2; 95% CI 0.1-0.5; p<0.01), and the more than 55 years of age category (OR = 0.2; 95% CI 0.1-0.4; p<0.01) were less predictive of high quality of life as compared with patients within the 18-35 years age group. Patients in joint families were more predictive of higher quality of life (OR = 2.4; 95% CI 1.4-4.2; p<0.01) in comparison with patients living in nuclear families. Patients who lived on the island for more years (48-75 years) were less predictive of higher quality of life (OR = 0.4; 95% CI 0.2-0.9; p<0.05) as compared with patients who lived fewer years on the island. Patients working in organized sectors were less likely to be predictive of higher quality of life (OR = 0.3; 95% CI 0.3-1.3; p<0.01) as compared to patients without work or a job. Patients with EPTB were less likely to be predictive of higher QoL (OR = 0.5; 95% CI: 0.3-0.9; p<0.05) when compared to patients with pulmonary TB. Patients who smoked (OR = 0.5; 95% CI 0.2-0.9; p<0.01) and who had experienced depression (OR = 0.1; 95% CI 0.0-0.2; p<0.01) were less likely to have higher QoL as compared to non-smokers and those who had not experienced depression, respectively (Table 2).

Results from multivariate regression show that patients in the age group 46-55 (OR = 0.1; 95% CI 0.0-0.5; p<0.01) and in the age group of more than 55 years (OR = 0.1; 95% CI 0.0-0.6; p<0.01) were less

Table 2: Predictors of Quality of life among patient with TB by logistic regression (Univariate and Multivariate Analysis)

Characteristics	Total Number	Good QOL	%	OR	CI	P Value	AOR	CI	P Value
Gender									
Female	118	85	72	1	-	-	1	-	-
Male	156	97	62	0.63	0.38-1.06	0.08	1.28	0.50-3.27	0.60
Age in years									
18-35	115	93	81	1	-	-	1	-	-
36-45	59	38	64	0.42	0.21-0.86	0.01	0.38	0.12-1.14	0.08
46-55	47	25	53	0.26	0.12-0.56	0.01	0.17	0.05-0.55	0.01
More than 55	53	26	49	0.22	0.11-0.46	0.01	0.17	0.04-0.62	0.01
Marital status									
Unmarried	104	73	70	1	-	-	1	-	-
Married	170	109	64	0.75	0.44-1.28	0.30	1.55	0.72-3.29	0.25
Family Type									
Nuclear	169	100	59	-	-	-	-	-	-
Joint	105	82	78	2.45	1.41-4.28	0.01	1.57	0.08-3.11	0.18
Living in Island									
20 years	63	46	73	1	-	-	1	-	-
21-29 years	47	38	81	1.56	0.62-3.89	0.34	0.88	0.28-2.77	0.83
30-38 years	60	39	65	0.68	0.31-1.48	0.33	0.65	0.23-1.80	0.41
39-47 years	51	30	59	0.52	0.24-1.16	0.11	0.71	0.23-2.18	0.56
48-75 years	53	29	55	0.44	0.20-0.97	0.04	0.73	0.21-2.55	0.62
Education									
Illiterate	24	16	67	1	-	-	1	-	-
School	222	143	64	0.90	0.37-2.20	0.82	0.35	0.10-1.23	0.10
College	28	23	82	2.3	0.63-8.32	0.20	0.51	0.08-2.92	0.45
Occupation									
Not working	81	61	75	1	-	-	1	-	-
Organised Sector	75	41	55	0.39	0.20-0.78	0.01	0.35	0.12-1.03	0.05
Unorganised Sector	118	80	68	0.69	0.36-1.30	0.25	1.08	0.36-3.17	0.88
SES									
Lower level	112	71	63	1	-	-	1	-	-
Middle Level	160	109	68	1.23	0.74-2.05	0.41	1.55	0.79-3.04	0.19
Upper Level	2	2	100	-	-	-	-	-	-
TB Type									
PTB	106	79	75	1	-	-	1	-	-
EPTB	168	103	61	0.54	0.31-0.92	0.02	0.70	0.34-1.44	0.34
Smoking									
Non Smoking	234	161	69	1	-	-	1	-	-
Smoking	40	21	53	0.50	0.25-0.98	0.04	0.64	0.27-1.53	0.32
Alcohol Use									
No alcohol use	188	115	61	1	-	-	1	-	-
Alcohol use	46	27	59	0.66	0.34-1.28	0.22	1.38	0.57-3.30	0.46
Stigma									
No Stigma	158	111	70	1	-	-	1	-	-
Having Stigma	116	71	61	0.66	0.40-1.10	0.11	0.70	0.37-1.33	0.28
Anxiety/ Depression									
No depression	140	119	85	1	-	-	1	-	-
Depression	134	63	47	0.15	0.08-0.27	0.01	0.10	0.05-0.21	0.01

Note: OR - Odds Ratio, CI - Confidence Interval, P Value - Probability Value, AOR - Adjusted Odds Ratio.

predictive of higher QoL as compared to patients in the age group of 18-35 years. Patients who had experienced depression were less likely to have higher QoL (OR = 0.1; 95% CI 0.0-0.2; p<0.01) as compared to non-smokers and those who had not experienced depression.

DISCUSSION

The results of this study shed light on several critical factors influencing the QoL among TB patients in the Andaman and Nicobar Islands. The findings prompt important discussions regarding the multifaceted nature of TB patients' well-being and the implications for targeted interventions and healthcare strategies (Li et al., 2017). The findings highlight significant associations between various variables, including age, occupation, family dynamics, smoking habits, TB type, and the mental health of individuals affected by TB. The salient finding from this study was that patients within the 18-35 years age group had higher QoL compared to others. One noteworthy aspect is the substantial impact of age on QoL, with a consistent decline in reported high QoL as individuals age. It is a known fact that as age increases, the QoL decreases (Alavi-Naini et al., 2012). This emphasizes the need for age-specific interventions and support mechanisms, recognizing that older TB patients may face unique challenges that impact their overall well-being.

Further highlighting the need to take work-related aspects into account in the context of tuberculosis management is the correlation between occupation and quality of life. On the other hand, over the course of treatment, it was noted that patients who were employed had higher QoL scores (Adebayo et al., 2024). Efforts to support TB patients, particularly those employed in the organized and unorganized sectors, may need to address occupational stressors and ensure workplace accommodations to improve QoL (Garcia et al., 2020). The influence of family dynamics on QoL is another crucial aspect. The finding that individuals in nuclear families report higher QoL suggests the potential role of family support structures (Wang et al., 2021). Healthcare initiatives could explore ways to involve and educate families in the care and support of TB patients, recognizing the impact of family environments on patient well-being (Dilas et al., 2023).

The study's identification of smoking habits as a significant predictor of QoL among TB patients underscores the interconnectedness of lifestyle factors with health outcomes. Integrating smoking cessation programs into TB management strategies could not only improve overall health but also positively impact QoL. Perhaps one of the most pressing issues highlighted by the study is the strong association between depression and low QoL among TB patients. The study's findings that there is a direct correlation between depression and poor quality of life in tuberculosis patients may be among the most urgent problems. This underscores the importance of mental health support within TB care. Integrating mental health screening, counseling services, and collaboration between TB and mental health professionals could significantly enhance the overall well-being of TB patients. Integrating age-specific support, occupational interventions, family involvement, and mental health services into TB management strategies is crucial to improving QoL. Additionally, smokers were shown to have a far worse quality of life in terms of their physical, psychological, social, and environmental well-being (Khalilzad Behrozian & Ahmadi, 2013). According to a different study, present smokers had higher rates of anxiety and sadness than never or former smokers did (Alavi-Naini et al., 2012; Rezaei et al., 2017).

These results emphasize the need for a holistic and individualized approach to TB care in the Andaman and Nicobar Islands. Targeted interventions should consider age-specific needs, occupational challenges, family dynamics, and mental health aspects to comprehensively address the well-being of TB patients. This study provides a valuable foundation for healthcare policymakers, practitioners, and researchers to develop and implement strategies that go beyond medical treatment, aiming to enhance the overall QoL of individuals affected by TB in this region. Additionally, the systematic review concluded that practical, innovative psychosocial and economic intervention studies are desperately needed to help

tuberculosis patients manage their condition and improve treatment adherence, outcomes, and overall quality of life (Thomas et al., 2016).

Furthermore, the distinction between pulmonary TB and extra-pulmonary TB in relation to QoL suggests the need for tailored approaches in the treatment and support of these different manifestations of the disease (Sreeramareddy et al., 2008). Extra-pulmonary tuberculosis is the term used to describe tuberculosis that affects organs other than the lungs, such as the meninges, pleura, lymph nodes, belly, genitourinary system, skin, joints, and bones. It requires a longer duration of treatment, and it also leads to long-term complications. Very little information is available regarding the QoL of extra-pulmonary TB patients (Brown et al., 2015). The long-term impact of extra-pulmonary tuberculosis on patients' quality of life must be evaluated.

The conclusions drawn in this study rely on information obtained through patient interviews, introducing the potential for underreporting of regular alcohol and tobacco usage due to sensitivity surrounding these behaviors. To mitigate this, medical social workers employed motivational interviewing techniques, creating a supportive environment to encourage patients to openly share their feelings and experiences. To address self-reporting bias in the study on alcohol and tobacco use, we have utilized validated tools for measuring alcohol and tobacco use; also, our data collection was done by trained social work researchers who have good experience with TB patients, which improved our data quality. It is essential to note that the study has focused on outpatient care recipients at government health and wellness centers, potentially limiting the generalizability for sicker patients admitted and treated in hospitals. However, as per the guidelines of the National TB Elimination Program, TB patients in India and in our study setting are treated in OPD settings predominantly, and hospitalized care is very minimal. Hence, our findings hold more generalizability.

CONCLUSION

In conclusion, this comprehensive study in the Andaman and Nicobar Islands provides valuable insights into the intricate interplay between alcohol use, demographic factors, and the QoL among TB patients. The observed decline in reported QoL with increasing age emphasizes the need for targeted interventions tailored to the unique challenges faced by older TB patients. The impact of occupation underscores the importance of addressing occupational stressors and ensuring workplace accommodations to enhance overall well-being. Furthermore, the influence of family dynamics on QoL suggests opportunities for involving families in the care and support of TB patients. The study's finding of smoking habits as a predictor of QoL underscores the importance of integrated healthcare strategies addressing both TB and lifestyle factors. Additionally, the strong association between depression and low QoL emphasizes the critical need for mental health support within TB care. Furthermore, future research should explore the experiences of hospitalized patients and those seeking TB treatment in the private sector to provide a more comprehensive understanding of alcohol use among TB patients in diverse healthcare settings. The immediate implications of our studies point out that screening for depression could lead to the identification of such patients, which will eventually lead to the implementation of mental and psycho-social interventions to specifically address depression. Thus, this study contributes significantly to the broader discourse on TB care, emphasizing the importance of addressing multifaceted factors to improve the overall well-being and QoL of individuals grappling with tuberculosis in this region.

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