

## Original Research Article

# Quality of life among patients on MDR-TB treatment in a district tuberculosis centre of a metropolitan city

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## ABSTRACT

**Background:** MDRTB is a global health concern with its current prevalence in India being 2.3% and 17.2% respectively among newly diagnosed and previously treated cases. Besides its clinical impact, the disease affects the QOL of patients suffering from MDR-TB. The objective of the study was to assess the quality of life among MDR-TB cases in comparison with non-MDR TB cases and TB cured subjects (Category I, RNTCP).

**Methods:** A cross sectional study was conducted in all the 14 TUs under District Tuberculosis Centre of Municipal Corporation of Bengaluru (BBMP). Study subjects comprised of 52 MDR-TB Cases, 53 Non-MDR-TB cases and 54 Category I TB cured subjects. WHOQOL BREF questionnaire was used to assess the QOL among study subjects. Median [IQR] scores of QOL in each of the domains among various groups were compared using Kruskal Wallis test.  $P < 0.05$  was considered as statistically significant.

**Results:** Median age among MDRTB cases was 35 years [IQR: 26-50] whereas it was 37 years [IQR: 28-47] among Non MDRTB cases and 30.5 years [IQR: 22-45] among TB cured subjects. Out of 52 MDRTB cases, 26(50%) were females compared to 14 (26.4%) among Non MDRTB cases and 26(48.1%) among TB cured subjects ( $p=0.0024$ ). As compared to non MDRTB cases, physical and environmental domains' scores of MDRTB cases were significantly low ( $p=0.01$  and  $p=0.001$  respectively). Whereas, as compared to TB cured subjects, physical and psychological domains' scores of MDRTB cases were significantly low ( $p<0.001$  and  $p<0.001$  respectively).

**Conclusions:** The QOL of patients suffering from TB is affected and the impact is even worse in MDRTB. Hence prompt treatment of TB and early diagnosis of MDRTB will reduce the disease severity and improve the QOL.

**Keywords:** MDR-TB, Quality of Life, BBMP, Bengaluru, QOL

## INTRODUCTION

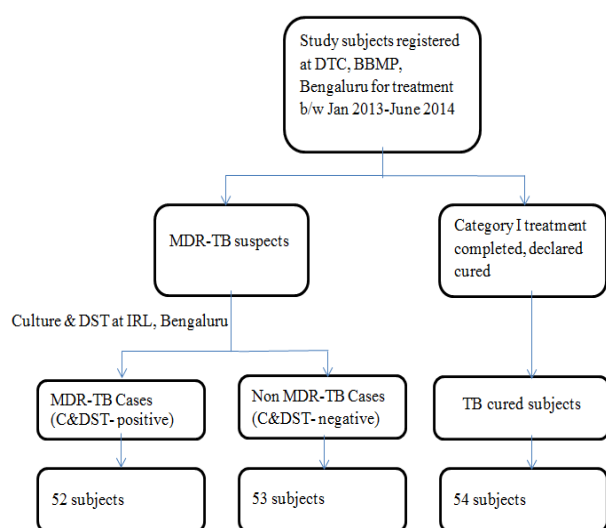
Tuberculosis is a top infectious disease killer worldwide. The 6 countries that stand out as having the largest number of incident cases in 2014 were India, Indonesia, Nigeria, Pakistan, People's Republic of China and South Africa. Globally, an estimated 3.3% of new cases and 20% of previously treated cases have MDR-TB. An estimated 480 000 people developed MDR-TB in 2014.<sup>1,2</sup> In India the estimated MDR-TB among new and retreatment TB cases is 2.2% and 15% respectively.<sup>2,3</sup>

Management of MDR-TB cases is more challenging requiring the use of second-line drugs that are more costly, cause more severe side effects and requires longer duration of treatment.<sup>2</sup> Though in medical practice, the method of assessing patient health status and disease is by laboratory or clinical tests, it becomes impossible to separate the disease from the individual's personal and social context, especially in chronic and progressive disease. It has been seen that apart from physical symptoms, TB patients face various problems that are psychological, social and economic in nature. Therefore,

for a comprehensive assessment of patients' health status, it is very much essential to assess the overall impact of MDRTB on health and patients' perception of well-being, besides routine clinical, radiological and bacteriological assessments.<sup>3</sup> Limited research looks into QOL on TB and MDR-TB. Hence this study makes an attempt to assess the QOL among MDR-TB cases in comparison with Non MDR-TB cases.

## METHODS

The present study was a cross sectional study, conducted in all the 14 tuberculosis units (TUs) under district tuberculosis centre (DTC) of Municipal Corporation of Bengaluru [BBMP- Bruhat Bengaluru Mahanagara Palike area], Karnataka. Study subjects were those cases diagnosed and put on treatment during the period January 2013- June 2014. Source of study subjects was the Register maintained at the District Tuberculosis Centre (DTC), BBMP, Bengaluru. Study subjects were selected at least in the ratio of 1:1:1 using simple random sampling technique. Accordingly, the study subjects consisted of 52 MDR-TB cases-confirmed with culture and drug susceptibility test (C&DST) at the intermediate reference laboratory (IRL), Bengaluru and put on MDR-TB treatment. The other two groups consisted of 53 Non MDR-TB cases who were diagnosed at IRL, Bengaluru and were continuing RNTCP treatment regimen in BBMP area during the same period and 54 TB cured subjects, who were declared cured under Category 1 of RNTCP in BBMP during the same period. Selection of study subjects was done as explained in Figure 1.



**Figure 1: Flowchart depicting the selection of study subjects.**

To calculate the sample size, a study conducted by Dhuria et al was considered, wherein comparison of QOL of TB cases with that of controls revealed- a least difference in the mean scores of 1.33 for social domain [mean scores of cases being 14.35 and controls being 15.68].<sup>4</sup> Based on above findings with an  $\alpha$  error of 5%

and power of the study at 80%, it was estimated that, a minimum of 41 subjects need to be studied in each group.

Review of previous records from BBMP showed that the required sample size for the cases would be met between January 2013 to June 2014. Hence, a complete enumeration of all the MDR-TB cases registered during that period was done with at least similar number of subjects in the other two groups, selected by simple random sampling technique.

## Data collection

Institutional ethical clearance was obtained. Prior permission was obtained from the District Tuberculosis Officer (DTO), BBMP, Bengaluru. A standard WHOQOL BREF questionnaire was used to assess the Quality of Life among MDR-TB, Non MDR-TB and TB cured subjects.<sup>5</sup> This questionnaire has 26 questions and covers four domains - physical health, psychological health, social relationships and environment. Transformed domain scores in each of the 4 domains range from 0-100. Interpretation of the scores follows a simple rule- Higher the scores better the quality of life.

Study subjects were identified from the DTC registry and traced to their residence with the help of the Senior Treatment Supervisor (STS), Health Visitor (HV) and DOTS provider of the respective TU, Designated Microscopic Centre (DMC) and Peripheral Health Institute (PHI). Interview technique was employed for collecting the data. A good rapport was established with the study subjects before collecting the data, explaining about the objective of the study and its usefulness to the community. Informed consent was taken from all the study subjects on a written consent form in the local language, in the form of a signature or left thumb impression. Confidentiality of the patient's personal details was assured by the interviewer. The study subjects were interviewed at their residence or at the nearest TU/ PHI (based on subject's choice). In case of emergency, prompt referral to the concerned MOTC was done. Appropriate counselling of the patients was done regarding the disease, treatment adherence and the side effects of the drugs used in the treatment regimen.

## Statistical analysis

Domain wise median scores (along with Inter Quartile Range [IQR]) were computed and compared. Kruskal Wallis test was used to compare the different domains of quality of life between the groups. This was followed by post hoc multiple comparison using LSD test.  $P < 0.05$  was considered statistically significant. All the analyses was carried out using IBM SPSS version 18.0.

## RESULTS

Out of 52 MDRTB cases, 26 (50%) were females compared to 14 (26.4%) among Control I and 26 (48.1%)

among control II ( $p=0.024$ ). Median age among MDRTB cases was 35 years [IQR: 26-50] whereas it was 37 years [IQR: 28-47] among Control I and 30.5 years [IQR: 22-45] among Control II. Majority of the cases, 30 (57.7%) were Hindus followed by Muslims 16 (30.8%) and Christians 6 (11.5%). Whereas 37 (69.8%) among Non MDRTB cases and 43 (79.6%) among TB cured subjects were Hindus. 16 (30.2%) among Non MDRTB cases and 11 (20.4%) among TB cured subjects were Muslims and Christians combined ( $p=0.05$ ). 23.1% of MDR TB cases

were Graduates and above in contrast to 5.7% among Non MDRTB cases and 7.4% among TB cured subjects, although this difference was not statistically significant ( $p=0.06$ ). 17 (32.7%) of MDRTB cases belonged to upper or upper middle class, whereas 6 (11.3%) of Non MDRTB cases and 11 (20.4%) of TB cured subjects belonged to upper or upper middle class and this difference in proportion observed between different socio-economic status was statistically significant ( $p=0.024$ ) (Table 1).

**Table 1: Socio-demographic characteristics of the study subjects.**

Socio-demographic characteristics		MDRTB N=52 n (%)	Non MDRTB N=53 n (%)	TB cured N=54 n (%)	P value
<b>Gender</b>	Male	26 (50)	39 (73.6)	28 (51.9)	0.0024
	Female	26 (50)	14 (26.4)	26 (48.1)	
<b>Age (in years)</b>	≤39	31 (59.6)	29 (54.7)	36 (66.7)	0.63
	40-59	14 (26.9)	19 (35.8)	13 (24.1)	
	≥60	7 (13.5)	5 (9.4)	5 (9.3)	
<b>Religion</b>	Hindus	30 (57.7)	37 (69.8)	43 (79.6)	0.05
	Others	22 (42.3)	16 (30.2)	11 (20.4)	
<b>Educational status</b>	Not literate	9 (17.3)	9 (17)	10 (18.5)	0.06
	Primary to high school	12 (23.1)	22 (41.5)	15 (27.8)	
	Intermediate/Diploma	19 (36.5)	19 (35.8)	25 (46.3)	
	Graduate and above	12 (23.1)	3 (5.7)	4 (7.4)	
<b>Employment status</b>	Gainfully employed	27 (51.9)	37 (69.8)	30 (55.6)	0.142
	Not gainfully employed	25 (48.1)	16 (30.2)	24 (44.4)	
<b>Socio economic status*</b>	Upper/upper middle class	17 (32.7)	6 (11.3)	11 (20.4)	0.0024
	Lower middle class	16 (30.8)	22 (41.5)	28 (51.9)	
	Upper lower/lower class	19 (36.5)	25 (47.2)	15 (27.8)	

\*Modified Kuppuswamy's classification of SES.

**Table 2: Comparison of QOL scores (transformed scores) among the study subjects in different domains.**

Domains	Median [IQR]			P value
	MDR-TB (N=52)	Non MDRTB (N=53)	TB cured (N=54)	
<b>Physical</b>	39.3 [25.0-56.3]	53.6 [39.3-64.3]	89.3 [82.1-96.4]	<0.001
<b>Psychological</b>	50.00 [38.5-62.5]	54.2 [50.0-66.7]	87.5 [79.2-95.8]	<0.001
<b>Social</b>	75.0 [66.7-75.0]	66.7 [58.3-75.0]	62.5 [50.0-75.0]	0.11
<b>Environmental</b>	65.6 [60.2-75.0]	75.0 [70.3-82.8]	62.5 [53.1-81.3]	<0.001

\*Kruskal Wallis test.  $p<0.05$  is considered statistically significant.

**Table 3: Multiple comparisons of QOL scores (transformed scores) among the study groups in different domains.**

Domains	Median [IQL]			P value			
	MDRTB (n=52)	Non MDRTB (n=53)	TB cured (n=54)	Overall	1 v/s2	1 v/s3	2 v/s3
<b>Physical</b>	39.3 [25.0-56.3]	53.6 [39.3-64.3]	89.3 [82.1-96.4]	<0.001	0.01	<0.001	<0.001
<b>Psychological</b>	50.00 [38.5-62.5]	54.2 [50.0-66.7]	87.5 [79.2-95.8]	<0.001	0.266	<0.001	<0.001
<b>Social relationship</b>	75.0 [66.7-75.0]	66.7 [58.3-75.0]	62.5 [50.0-75.0]	0.11	0.210	0.152	0.860
<b>Environmental</b>	65.6 [60.2-75.0]	75.0 [70.3-82.8]	62.5 [53.1-81.3]	<0.001	0.001	0.495	<0.001

\*post hoc multiple comparison test using LSD method.  $p<0.05$  is considered statistically significant. 1= MDRTB, 2 = Non MDRTB, 3= TB cured.

It was observed that the transformed median scores of MDRTB cases in physical, psychological, social and environmental domains were 39.28 [25.00-56.35], 50.00 [38.54-62.50], 75.00 [66.66-75.00] and 65.62 [60.15-75.00] respectively. Overall there was a statistically significant difference in the median scores in physical, psychological and environmental domains between the groups (Table 2).

Physical and environmental domains' scores of MDRTB cases were significantly low as compared to Non MDRTB cases and this difference was found to be statistically significant ( $p=0.01$  and  $p=0.001$  respectively). This indicates that these two domains were significantly affected in MDRTB. Whereas, as compared to TB cured subjects, physical and psychological domains' scores of MDRTB cases were significantly low ( $p<0.001$  and  $p<0.001$  respectively) indicating that these two domains were significantly affected in MDRTB (Table 3).

## DISCUSSION

In several studies it was observed that TB affects all the predicted domains of QOL i.e. physical, psychological, health perceptions and social role functioning. In the present study, transformed- median domain scores in physical (39.3 vs. 53.6 vs. 89.3) and psychological (50.0 vs. 54.2 vs. 87.5) domains were significantly lower among MDRTB cases as compared to non MDRTB cases and TB cured subjects respectively, which is similar to several other studies.<sup>6-10</sup> The impact of the disease on physical functioning was in the form of easy fatigability, regular body ache, and lack of sleep, unrest and decreased working capacity. There were reports regarding restrictions towards their freedom of movement, participation in home and day to day recreation/leisure activities.<sup>6</sup> Besides treatment regimen for MDR-TB involves several months of complex drug combinations including extended periods of injectables, which are associated with significant adverse effects.<sup>11</sup> The respondents reported the wide range of psychological reactions like negative feelings of their survival, poor health and self-esteem. This along with the prolonged disease course (multiple episodes of TB) may affect physical and psychological domains of QOL.

Also in the present study, both MDR-TB (75.0, 65.6) and Non MDRTB (66.7, 75.0) cases accorded the highest transformed- median scores in the social and environmental domains respectively, which is similar to a study conducted by Qahtani et al in Saudi Arabia.<sup>12</sup> This may be attributed to the Higher educational and Socio-Economic Status among MDRTB and Non MDRTB cases as compared to TB cured subjects. This is in contrast to a study conducted by Sharma et al in North India<sup>6</sup> wherein it was observed that the mean differences in scores for the cases (MDRTB and PTB) were highly significant for all the domains and the overall QOL; (mean difference MDRTB 6.83; PTB 4.81). Results have

shown that there is significant impact ( $p>0.01$ ) on Psychological (F-ratio=49.201) and Environmental domains (F-ratio=65.311). Most patients claim that with the passage of time they have developed constraint relations with their family and friends as they get lesser support from their wards. The environmental domain related to the sense of safety, security, home environment, transport and financial security was also negatively affected in MDRTB and PTB patients.

## CONCLUSION

Quality of life of patients suffering from TB is affected and the impact is even worse in patients suffering from MDR-TB. Providing care and support to MDR-TB cases in the form of physical, financial, psycho-social and nutritional support, through various social welfare programmes would go a long way in improving their condition. Also counselling the patients with respect to treatment adherence, adverse drug reactions and disease prognosis will improve the compliance of the patients. Hence all these measures will reduce the disease severity and improve the QOL of patients suffering from MDRTB.

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