International Journal of Community Medicine and Public Health
Ramchandra T et al. Int J Community Med Public Health. 2017 Nov;4(11):4107-4112
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20174632

Original Research Article

Study of socio-demographic factors causing interruption of anti-tuberculosis treatment in DOTS centre in Warangal district of Telangana State

Tagaram Ramchandra[1], N. Pragathi Kumar[2]*, Niharika Lakkoju[2]

Department of Community Medicine, [1]Shadan Institute of Medical Sciences, Hyderabad, [2]Kakatiya Medical College, Warangal, Telangana, India

Received: 10 September 2017
Accepted: 28 September 2017

***Correspondence:**
Dr. N. Pragathi Kumar,
E-mail: drrahulk2@gmail.com

ABSTRACT

Background: Tuberculosis has existed for millennia and remains a major global health problem. It causes ill-health in millions of people each year and in 2015 it was one of the top 10 causes of death worldwide. Understanding the specific reasons for unsuccessful outcomes is important to improve the treatment system. This present study was carried out to find out the effects of socio-demographic factors on TB defaulters under DOTS centre in Warangal District, Telangana state.
Methods: A cross sectional study was carried among 103 defaulters of TB patients in 3 TB units (TU) Warangal (urban), Ragunathapally (rural) and Eturunagaram (tribal) out of 7 TB units in Warangal district, attached to District Tuberculosis Centre (DTC) from January 2016 to June 2016 by interview technique utilising a pretested and structured questionnaire to collect the data. Statistical analysis: Percentages, proportions and chi-square test were applied whenever necessary.
Results: In present study, males (35%) were more than females (7.8%) and 42.8% were in the age group of 40-55 years, followed by 28.1% were 26-39 years age group. Majority of defaulters were in nuclear family (77.7%) followed by joint family (21.3%). Cost of travel as a reason for default of treatment was seen more in tribal area (16.5%) than rural (12.6%) and urban (4.8%) TUs. The TB patients residing in tribal areas are more prone to default, an important reason being the distance needed to travel to the closest health facility, availability and the need to travel by public transport.
Conclusions: Tuberculosis is an infectious disease which has a devastating impact on the economic wellbeing of individual and their families. Most of the defaulters were illiterates residing in tribal area. Cost of travel as a reason for default of treatment was seen more in tribal TU 17(16.5%) than urban and rural TUs.

Keywords: Defaulters, DOTS, District tuberculosis centre, Tuberculosis, Tuberculosis unit

INTRODUCTION

Tuberculosis (TB) has existed for millennia and remains a major global health problem. It causes ill-health in millions of people each year and in 2015 it was one of the top 10 causes of death worldwide, ranking above HIV/AIDS as one of the leading causes of death from an infectious disease. There were 1.4 million TB deaths in 2015, and an additional 0.4 million deaths resulting from TB disease among HIV-positive people. In terms of cases in 2015, there were 10.4 million new TB cases (including 1.2 million among HIV-positive people), of which there were 5.9 million men, 3.5 million women and 1.0 million children. Overall, 90% of cases were adults and 10%

children, and the male: female ratio was 1.7:1. The global TB estimate has seen a considerable upward revision in recent years, mainly a result of new surveillance, and estimates being revised in India.[1] The TB epidemic is much larger than earlier thought, particularly in the WHO South-East Asia Region (SEAR). This is because in 2015 there were 4.3 million "missing cases". The Region accounts for nearly half (45.6%) the global burden in terms of TB incidence even though it comprises only a quarter of the world's population. Six SEAR Member States find a place in the global list of 30 high TB-burden countries. They include, in order of incidence rate, the Democratic People's Republic Korea, Indonesia, Myanmar, Bangladesh, India and Thailand. Of these India (23%) and Indonesia (10%) alone account for a third of the world's burden.[2] These grim figures need to change rapidly. Tuberculosis is a social disease with medical aspects. The available therapeutic regimens have inherent disadvantage of long treatment duration, results in patient's non-compliance and yields the risk of drug resistance.[3] Understanding the specific reasons for unsuccessful outcomes is important to improve the treatment system. These factors are absolutely critical to cure the patients, prevent further transmission, and stop the emergence of resistance cases.

Objectives

1. To determine the socio demographic factors among TB defaulters in the DOTS centre of Warangal district.
2. To compare the factors among defaulters in relation to urban, rural and tribal TB units of Warangal district.

METHODS

A cross sectional study conducted in 3 TB units out of 7 TB units in Warangal district. Area covered by 3 TB units consist of Warangal TU (urban), Ragunathapally TU (rural), Eturunagaram TU (tribal), attached to district Tuberculosis centre (DTC) from January 2016 to June 2016. Lottery method was adopted for selecting three T.B. units (40%) out of seven in Warangal District. 1 TU from urban, 1 TU from rural and 1 TU from tribal area. For this study, only the defaulters of DOTS who were enrolled in TB registers of concerned TB units were taken as study sample from selected TB units. The addresses of defaulters of DOTS were obtained from T.B. registers of concerned TB units. From 2015, total TB cases were registered in selected TUs were 1056 and 110 defaulters among them. The patients were contacted at their homes and informed about the study and obtained data from 103 defaulters. Defaulters of DOTS in age group of below 10 years and above 70 years of age, defaulters of DOTS, who were migrated, absconded and died, were excluded. Warangal district headquarters is situated at distance of 146 kms from Hyderabad City (Telangana) consists of 3 cities – Warangal, Hanamkonda and Kazipet. DTC is 9 Kms away from Kazipet Railway Junction. The district tuberculosis centre has 7 TB units (TUs) and each is attached with 5 to 6 microscopy centres. It covers total of 1097 villages. Urban TU located at DTC Warangal, Rural and Tribal TU areas located at a distance of 56 kms and 98 kms respectively from DTC. A pretested and pre structured questionnaire was used to collect the data by interview technique, a written consent was taken from each study participants after informing fully on how the study would be carried out and how the collected data would be handled to ensure confidentiality and privacy.

Statistical analysis

Data was entered into Microsoft Excel and analyzed using the Statistical Package of Social Sciences (SPSS) version 22.0. Statistical significance was set at $p \leq 0.05$.

RESULTS

Table 1: Age and gender wise distribution of study population.

Age	Gender		Total (%)
	Female (%)	Male (%)	
10-25 years	8 (7.80)	6 (5.80)	14 (13.60)
26-39 years	6 (5.8)	23 (22.3)	29 (28.10)
40-55 years	8 (7.80)	36 (35)	44 (42.8)
56-70 years	4 (3.8)	12 (11.70)	16 (15.5)
Total	26 (25.2)	77 (74.8)	103 (100)

According to Table 1, majority (42.8%) population were between 40-55 years age group, in which males contribute 35% and females 7.8%.

Table 2: Distribution of study population according to TB Units

Name of TB unit	No. (%)
Warangal (urban)	32 (31)
Ragunathapally (rural)	34 (33)
Eturunagaram (tribal)	37 (36)
Total	103 (100)

According to Table 2, among the study population, 36% belonged in tribal Unit, 33% belonged to rural and 31% belonged to urban TB units.

As depicted in Table 3**,** most of the study population (81.5%) were Hindus followed by 9.8% Christians and 8.7% Muslims. 85.4% of defaulters were married and 14.6% were unmarried. Majority of defaulters (40.8%) were living in semi pakka houses. Among the study population 11.7% had overcrowding. 38.8% defaulters were Illiterates followed by primary education (19.4%). 77.7% of population belonged to nuclear family and most of the study population 35.9% were unskilled workers followed by unemployed 22.3%. Majority of the study population (43.7%) belonged to Upper lower class followed by lower class (26.2%).

Table 3: Socio-demographic factors of study population.

Socio-demographic factors	Frequency (%)
Religion	
Hindu	84 (81.5)
Muslim	9 (8.7)
Christian	10 (9.8)
Marital status	
Married	88 (85.4)
Unmarried	15 (14.6)
Type of housing	
Kacha	30 (29.2)
Semi-pakka	42 (40.8)
Pakka	31 (30)
Overcrowding	
Yes	12 (11.7)
No	91 (88.3)
Family type	
Nuclear	80 (77.7)
Joint	22 (21.3)
Extended	1 (1)
Education	
Illiterate	40 (38.8)
Primary	20 (19.4)
Middle school	14 (13.6)
High school	11 (10.7)
Intermediate	10 (9.7)
Graduate	6 (5.8)
Post graduate	2 (1.9)
Occupation	
Professional	2 (1.9)
Semi professional	3 (2.9)
Clerical/shop/owner/farm	13 (12.6)
Skilled worker	15 (14.5)
Semi –skilled worker	10 (9.7)
Unskilled worker	37 (35.9)
Unemployed	23 (22.3)
Socio economic status	
Upper class	8 (7.8)
Upper middle class	14 (13.6)
Lower middle class	19 (18.4)
Upper lower class	38 (36.9)
Lower class	24 (23.3)

Table 4: Literacy status among urban and tribal study groups.

Educational status	Warangal (urban) (%)	Eturunagaram (tribal) (%)
Illiterate	6 (5.8)	20 (19.4)
Literate	26 (25.2)	17 (16.6)

Chi square= 9.107, df=1, p<0.0025.

According to Table 4, among defaulters, urban area had fewer illiterates than tribal area and literates were more in urban area than tribal area. The observed difference between 2 groups found to be significant (p<0.0025).

Table 5: Literacy status among urban and rural study groups.

Educational status	Warangal (urban) (%)	Ragunathapally (rural) (%)
Illiterate	6 (5.8)	14 (13.6)
Literate	26 (25.2)	20 (19.4)

Chi-square = 3.9256, df=1, p<0.047.

As shown in Table 5, among defaulters, in urban TU literates (25.2%) were more than rural area and illiterates were more in rural TU area. The observed difference between urban and rural area was found to be statistically significant.

As per Table 6**,** most of the lower class belongs to tribal area (27.2%) whereas upper class includes majority of urban (17.6%) study population. The difference between 3 TU's was found to be statistically significant.

As per Table 7, among the study participants cost of travel as a reason for default of treatment was seen more in tribal TU 17(16.5%) than urban and rural TUs. The observed difference between 3 groups was found to be statistically significant.

According to Table 8, among the study population 45.6% consumes alcohol and 38.8% were smokers.

According to Table 9, 43.7% of the study population had the habit of smoking and the higher proportion of smokers was between 40-70 years (19.5%). The observed difference between age groups was found not to be statistically significant.

Table 6: Socio economic status in relation with 3 TUs.

Socio economic status	Name of TB unit			Total (%)
	Warangal (urban) (%)	Ragunathapally (rural) (%)	Eturunagaram (tribal) (%)	
Upper class	18 (17.6)	14 (13.6)	9 (8.8)	41 (39.8)
Lower class	14 (13.6)	20 (19.4)	28 (27.2)	62 (60.2)
Total	32 (31)	34 (33)	37 (36)	103 (100)

Chi square=7.33 df= 2 p<0.025.

Table 7: Cost of travel is the reason to stop Anti tuberculosis treatment among the study participants.

Cost of travel	Name of TB unit			Total (%)
	Warangal (urban) (%)	Ragunathapally (rural) (%)	Eturunagaram (tribal) (%)	
Yes	5 (4.8)	13 (12.6)	17 (16.5)	35 (34)
No	27 (26.2)	21 (20.4)	20 (19.5)	68 (66)
Total	32 (31)	34 (33)	37 (36)	103 (100)

Chi-Square=7.442, df =2, p<0.024.

Table 8: Proportions of addictions among the study participants.

Addictions	Yes (%)	No. (%)	Total (%)
Alcohol	47(45.6)	56(54.4)	103 (100)
Smoking	40(38.8)	63(61.2)	103 (100)

Table 9: Smoking related with age among the study participants.

Age	Smoking		Total (%)
	Yes (%)	No (%)	
10-39 years	17 (16.5%)	28 (27.2%)	45 (43.7%)
40-70 years	20 (19.5%)	38 (36.8%)	58 (56.3%)
Total	37 (36%)	66 (64%)	103 (100%)

Chi-square= 0.12, df=2, p>0.72.

Table 10: Smoking is a reason to stop Anti tuberculosis treatment.

Smoking is a reason to stop treatment	Name of TB unit			Total (%)
	Warangal (urban) (%)	Ragunathapally (rural) (%)	Eturunagaram (tribal) (%)	
Yes	10 (9.8)	15 (14.6)	16 (15.5)	41 (39.8)
No	22 (21.2)	19 (18.4)	21 (20.5)	62 (60.2)
Total	32 (31)	34 (33)	37 (36)	103 (100)

Chi square =1.423, df=2, p>0.490.

As shown in Table 10, among the study population 39.8% of patients were defaulted due to habit of smoking. And it was seen more in tribal TU (15.5%). The observed difference between 3 groups was found not to be statistically significant.

DISCUSSION

In the present study, 42.8% of TB patients were in the age group of 40-55 years, followed by 28.1% of TB patients in the age group of 26-39 years which is known to be the most economically productive period of life. Similar findings of age distribution were observed in following studies; MaheshKumar et al found that age group between 35-44 years was more non-compliant (25.4%).[4] Another study by Chatterjee et al also found that defaulter significantly increased with age, the maximum age was being in 45-49 years.[5]

In our study, males (35%) were more than females (7.8%) which is similar to a study regarding gender discrimination in TB in Dindigul and Puducherry districts of Tamil Nadu stating that among defaulters males were (78%) more than females (22%).[6] In another study, treatment outcomes in Tuberculosis patients placed under directly observed treatment short course (DOTS) done by Chadha and Bhagi, it was reported that 58.8% patients were between 21-40 years of age, males were 67.6% and females were 32.4%.[7]

In our study, majority of the population were married (85.4%), which is similar to a study on risk factors for default and interruptions among category II patients in Dindigul and Puducherry districts of Tamil Nadu which showed that majority of defaulters (84.9%) were married.[6] The TB patients residing in tribal areas are more prone to default, an important reason being the distance needed to travel to the closest health facility, availability and the need to travel by public transport. In a study reported from Mexico, out of the 431 TB patients, 67% lived in rural areas and belonged to different communities.[8]

In this study, amongst 103 defaulters, 77.7% belonged to nuclear family and 21.3% were of joint family. Similarly

a study conducted by Kumar et al showed that the drug defaulters in pulmonary Tuberculosis reported that majority 73.4% were married, and there was no significant difference in prevalence rate of defaulters belonging to joint (70.6%) or unitary (72.6%) families.[9]

Most of the defaulters in this study were 37 (35.9%) unskilled workers (daily labour), 23 (22.3%) unemployed, 15 (14.5%) skilled workers (working in Government and private sectors), 13 (12.6%) clerical/shop owner/farmers, 10 (9.7%) semiskilled workers, 3 (2.9%) semi-professional and 2 (1.9%). Unemployed were not able to carry out normal routine work due to TB disease. Unemployment, being a pensioner, homelessness and overcrowded living conditions were revealed as important default predictors as evidenced in studies conducted in Uzbekistan.[10] Another study by Jittimanee et al showed that treatment default was five times greater for patients who were daily paid workers, as they were not paid when they were absent from work, therefore they may choose to work, rather than to go to the clinic for treatment.[11] In a study of Finlay et al revealed default was associated with employed patients missing treatment due to employment reasons mentioned by patients included that they were too busy and did not have enough time, workplace was too far from the TB clinic, their employer did not allow them to get TB treatment and some patients did not want other co-workers to know that they had TB.[12]

In the present study, most of the defaulters were in upper lower class (43.7%) followed by lower class (26.2%). Besides the disease burden, TB also causes an enormous socio-economic burden as most of them were unskilled workers (daily labour), and unemployed. Similar finding was observed in a study by Lamsal et al that poverty and TB are closely connected. The poor have higher contact rates due to crowded homes, more active infection due to sub-optimal nutrition and working conditions, and they frequently have less access to diagnostic and treatment facilities. They may have less flexibility regarding work and clinic attendance and less ability to pay for medications and transport.[13] Among the study participants, cost of travel as a reason for default of treatment was seen more in tribal area 16.5% than rural (12.6%) and urban (4.8%) TUs. Similarly in the Southern Ethiopia study, cost and time of travelling to the treatment centre were major contributory factors associated with compliance to treatment, as non-compliant patients paid significantly more for transport than the compliant patients.[14] Majority of the defaulters (54.4%) were non-alcoholics in present study. Findings were consistent with a study on risk factors for default and interruptions among category II patients in Dindigul and Puducherry districts of Tamil Nadu, showed that more than half 75 (70.75%) of the patients did not consume alcohol, 31 (29.25%) were alcohol consumers.[6] Another study done by Rajeswari et al, showed that 34% consumed alcohol and 66% did not consume alcohol.[15]

In the present study, majority of defaulters 61.2% were non-smokers, 38.8% were smokers. Smoking adversely affects the outcome of anti-TB treatment. But it is not significantly associated with default from treatment. Smoking and Tobacco had no association with DOTS defaulters. Similar findings were observed in a study done by Selvam in Tamil Nadu, showed 44% of the patients were smokers and the rest 56% were non-smokers.[16]

Limitations

The study was only carried out in 3 TB units out of 7 in one district due to financial and time constraints; therefore, it will not be easy to generalize to other areas.

CONCLUSION

Tuberculosis is an infectious disease which spreads from one person to another. It has a devastating impact on the economic wellbeing of individual and their families. TB is one of the major public health problems in India. It is important to study and understand the magnitude of risk factors for defaults of treatment in TB patients for making policies, programmes and strategies. It was found that majority of defaulters were males (74.8%) and 70.9% were in the age group of 26-55 years which is economically productive years of life. Majority of defaulters were married (82.1%), 40.8% were living in semi Pakka houses, 77.7% belonged to nuclear family. In this study Illiterates were 38.8% and most of illiterates were in tribal area and these differences were found to be statistically significant. 35.9% were unskilled workers, 22.3% unemployed. 43.7% belonged to Upper lower class and 26.2% lower class. Cost of travel as a reason for default of treatment was seen more in tribal TU 17 (16.5%) than urban and rural Tus and the differences between these TU'S was found to be statistically significant, and the habit of smoking was present in 40 (38.8%) defaulters and 63 (61.2%) were non-smokers, and consumption of alcohol present in 45.6%.

Recommendations

Establish more DOTS centres & ensure DOTS providers working properly or not and staff recruitment in areas where centre is far away. Establish de-addiction and counselling centres for alcoholics and educate them. Income-generating activities should be initiated to improve economic status of people who were in upper lower class and lower class. TB patients should be linked to social services and community programmes that improve income. Food provision & incentives for patients on TB treatment will increase the compliance to drugs.

ACKNOWLEDGEMENTS

We owe our sincere thanks and deep sense of gratitude to Dr. Punam Kumari Jha, Professor and Head, and Dr. K. Kishore Kumar, Associate Professor, Dept. of

Community Medicine, Kakatiya Medical College, Warangal. We also acknowledge the help and support the study participants during the study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Ramchandra T, Pragathi KN, Lakkoju N. Study of socio-demographic factors causing interruption of anti-tuberculosis treatment in DOTS centre in Warangal district of Telangana State. Int J Community Med Public Health 2017;4:4107-12.