Social stigma among tuberculosis patients attending DOTS centers in Delhi

Bhushan Dattatray Kamble¹, Sunil Kumar Singh¹, Sumit Jethani², Vinoth Gnana Chellaiyan D³, Bhabani Prasad Acharya⁴

¹Assistant Professor, ²Associate Professor, Department of Community Medicine, North DMC Medical College and Hindu Rao Hospital, Delhi, ³Department of Community Medicine, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Kelambakkam, Chennai, Tamil Nadu, ⁴Department of Community Medicine, Atal Bihari Vajpayee Institute of Medical Sciences and RML Hospital, New Delhi, India

ABSTRACT

Background: Every year >9 million people suffer from tuberculosis (TB) and India accounts for >25% of global TB burden. Tuberculosis patients experience both psychological and social suffering. Amongst the problems met by tuberculosis patients, social stigma has been increasingly recognized. This study was done to assess social stigma and associated factors among the tuberculosis patients attending Directly Observed Treatment Short-course (DOTS) centers in South East Delhi.

Material and Methods: It was a cross-sectional study carried out among tuberculosis patients availing treatment from DOTS centers of South East Delhi. Out of 48 DOTS centers in South East Delhi, 6 centers were selected on the basis of population proportion to size. A total of 270 TB patients were interviewed using a semi-structured, pretested questionnaire consisting of stigma-based questions. Fisher exact and Chi-square test applied.

Results: The mean age of patients was 31.5 years (SD ± 11.5) with age ranging from 18 to 77 years. Males were higher (57.4%) compared to females (42.6%). 123 (45.5%) perceived stigma with family/friends and 92/158 (58.2%) perceived stigma at workplace. Young patients (<30 years), males faced more stigma at workplace and lower socioeconomic class faced higher stigma with family and friends (P < 0.05).

Conclusion: There is still higher stigmatization faced by patients with TB at family/friends and at workplace. Motivation by friends/family and support at workplace has been crucial in achieving successful treatment outcomes.

Keywords: Delhi, DOTS, stigma, tuberculosis patients, workplace stigma

Introduction

Tuberculosis, one of the oldest diseases known to affect humans, is a major cause of death worldwide. This disease, which is caused by bacteria of Mycobacterium tuberculosis complex, usually affects the lung, although other organs are involved in one-third of cases. Transmission usually takes place through the airborne spread of droplet nuclei produced by patients with infectious pulmonary tuberculosis.[9] Globally, an estimated 10.0 million (range, 9.0–11.1 million) people fell ill with TB in 2018, a number that has been relatively stable in recent years with an estimated 1.2 million (range, 1.1–1.3 million) TB deaths among HIV-negative people.[5] India accounts for a quarter of the global TB burden with an estimated 27 lakh new cases in 2018 and 4.4 lakh deaths among HIV-negative people.[6]

TB is a social problem and could not be addressed by health professionals alone. Addressing TB needs intersectoral approach.[4] Social stigma is “an undesirable or discrediting attribute that an individual possesses, thus reducing that

Address for correspondence: Dr. Vinoth Gnana Chellaiyan D,
Department of Community Medicine, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Kelambakkam, Chennai, India. E-mail: drchellaiyan@gmail.com

Received: 27-04-2020 Revised: 10-06-2020 Accepted: 01-07-2020 Published: 25-08-2020

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Kamble BD, Singh SK, Jethani S, Chellaiyan D VG, Acharya BP. Social stigma among tuberculosis patients attending DOTS centers in Delhi. J Family Med Prim Care 2020;9:4223-8.
individual’s status in the eyes of society.”[3] Stigma and discrimination have an enormous impact on sufferers. While men have to deal with stigma at workplace and community level, women have to deal within the household and in the immediate neighborhood and society.[8] The obvious cause of discrimination is a fear of being infected, yet stigma and discrimination also occur for noninfectious diseases such as cancers[7] and mental health problems.[9] A lot of socioeconomic factors like poverty, nutrition, and diet, social stigma, poor accessibility to health services, lack of knowledge are responsible for late diagnosis and increased mortality among women due to TB. Amongst all the problems met by tuberculosis patients, social stigma has been increasingly recognized. The patient of TB experiences both psychological and social sufferings.

People have stigmatizing opinions and misconceptions about tuberculosis patients such as they are dirty, alcoholic, unemployed, hereditary-related, bad family, and occupation-related. These stigmatizing thoughts often lead to discrimination against people with TB in different ways like losing the current job or unable to get a new job, shunned by family and friends, cannot get married, and receiving poor treatment. People who face unaddressed stigma and discrimination develop poorer psychosocial health and are less likely to recover from disease due to lack of self-motivation towards treatment.[4]

Social stigma always remains an important and neglected aspect, which is leading to under-reporting of TB cases to the health system and taking treatment from quack/unqualified health care practitioners in India. Also, when people do not seek treatment because of stigma, they are more likely to transmit the disease to their family and friends. There was a paucity of studies focusing on this important aspect of tuberculosis in India. Thus, this study was done to assess social stigma and associated factors among the tuberculosis patients attending Directly Observed Treatment Short-course (DOTS) centers of the South East District of Delhi.

Materials and Methods

Study design and setting

The study was a cross-sectional, observational study conducted in DOTS Centers of the South East District of Delhi.

Study duration

The study was carried out from April 2019 to August 2019.

Study population

The study population included tuberculosis patients availing treatment from DOTS centers of South East Delhi.

Inclusion criteria

1. Patients who were diagnosed with tuberculosis as per Revised National TB Control Program (RNTCP) and availing treatment from the DOTS centers

2. Patients of age more than 18 years.

Exclusion criteria

The following patients were excluded.

1. Debilitated patients

2. Patients with other comorbid illness including HIV infection, diabetes, and other chronic diseases.

Sample size

The sample size was calculated using the prevalence of social stigma among TB patients - 60% from the previous study[9] and relative precision of 10% using the formula: \(4pq/d^2\), the sample size arrived was 267. The present study included a sample of 270.

Sampling technique

There were total of 48 DOTS centers functioning in South East Delhi during the study period. Of these, six DOTS centers were selected on the basis of population proportion to size. Batla House, Garhi, Kotla, Nehru Nagar, Malviya Nagar, and Lajpat Nagar DOTS centers were selected in this study. 45 patients were interviewed at each of these six selected DOTS centers by consecutive sampling method.

Data collection tool

Semi-structured, pretested questionnaire was used for data collection. The questionnaire consisted of questions related to the basic sociodemographic profile, treatment history, and social and perceived stigma among TB patients attending the DOTS center.

Data analysis

The data was entered in Microsoft Excel spreadsheet and analyzed using Statistical Package for Social Sciences (SPSS IBM) version 22.0. Proportions and means were used for describing the data. Normality was assessed before applying for tests of significance. Chi-square test was applied and \(P\) value of < 0.05 was considered to be significant.

Ethical considerations

Ethical clearance was obtained from the institutional ethics committee of North DMC Medical College, Delhi (No. IECDR-125/2019). The study participants were explained about the study and after obtaining informed written consent, data was collected. The confidentiality of the information provided was maintained.

Results

In the present study total of 270 tuberculosis patients from six DOTS centers were studied, the mean age of patients was 31.5 years (SD ± 11.5) with age ranging from 18 to 77 years. The majority of the patients (56.7%) were in the age group of 18–37 years. Males were more (57.4%) as compared to females (42.6%), and more than half (58.9%) of patients...
were married while only (1.1%) were divorcees. About three-fourth (73.3%) of the patients belonged to the nuclear family. The majority (82.9%) of patients were Hindus followed by Muslims (14.1%). Almost half (51.1%) of the patients belonged to the lower class of socioeconomic status. Mean (SD) of total family income per month (INR) was 12,860 (± 14994) ranging from 1000 to 100,000 INR. Mean (SD) of per capita (INR) income was 270 (± 2929) with a range of 100 to 20,000 Indian rupees [Table 1].

Among the 270 patients, about three fourth (73.3%) of them were in new while 71 (26.3) were previously treated patients. The majority (74.4%) of them had pulmonary TB while one fourth (25.6%) had extrapulmonary TB. About twothird (64.8%) of patients were in the intensive phase of treatment [Table 2].

Among 270 patients, nearly half (45.5%) of them had fear of disclosing the disease to their friends and family while about one third (31.5%) of patients had never disclosed their disease to friends. More than half (58.2%) of patients had feared to disclose their condition at the workplace [Table 3].

Out of 270 TB patients, nearly half (45.5%) of them perceived stigma with family/friends. Among 158 TB patients who were working, more than half (58.2%) perceived stigma at workplace. Further bivariate analysis showed that <30 years of age, males faced more stigma at workplace and lower socioeconomic class faced higher stigma with family and friends. These were statistically significant (P-value < 0.05) [Table 4].

### Discussion

In the present study, the basic sociodemographic profile was comparable with other studies as discussed below. The mean age of patients was 31.5 years (SD ± 11.5), which is comparable to other studies- Anand T et al[11] in Delhi- 30.51 years (SD ± 11.3). The majority (56.7%) of patients in our study were in the age group of 18–37 years is similar to study by Duko B et al in Ethiopia.[12] Males were more (57.4%) compared to females (42.6%) in our study. Similar results were found in a study conducted by Dhingra VK et al[13] in Delhi, Rajeswari R et al[14] in Tamil Nadu, and by Qiu L et al[15] in China. Likewise, family type, marital status, categories of TB treatment, and phases of treatment were similar to previous studies.[10,13-16]

In the present study, nearly half (45.5%) perceived stigma with family/friends and more than half (58.2%) perceived stigma at workplace. In a study conducted in southern Thailand by Rie AV et al[17] reported that 63.3% of the TB patients had experienced stigma. In the present study, almost half (45.5%) of patients had fear of disclosing the disease to their friends while about one third (31.5%) of patients had never disclosed their disease to friends. Similar findings were reported by Atre SR et al[18] that 75% wanted to hide about their disease from others. Dhingra VK et al[19] found that more than half (60.0%) of patients didn't want to disclose their disease to others. In another similar study conducted by Rajeswari R et al[13] in Tamil Nadu, it was found that almost half (43.2%) of patients didn't want to disclose their disease and they gave dummy names and addresses to avoid being known and exposed to their acquaintances. In a qualitative study by Craig GM et al[18] in the UK also found that most participants hid their disease condition and TB medications from relatives in order to avoid eviction and rejection by Somali community. More than half (58.2%) of the patients feared to disclose their condition at their workplace. In the other study, many men felt inhibited from disclosing the diagnosis to friends (43%) and nevertheless to their spouse (16%).

In our study, among those who disclosed, only (10.3%) of them had faced avoidance by their friends due to the disease while in the study by Aryal S et al[20] almost half (43.3%) had faced avoidance by friends. The study participants expressed that if neighbors, colleagues, or others in the workplace knew about the disease status they might avoid them. These concerns were also expressed by TB patients of a study by Lifecooghe R et al[21] in which neighbors and friends attitude towards them was negative and tried to avoid mingling with them. Similarly, in a qualitative study done by Yellapa V et al[22] among TB patients in south India.

---

**Table 1: Distribution of patients according to sociodemographic profile (n=270)**

| Variable          | Category           | Number (%) |
|-------------------|--------------------|------------|
| Age group         | 18-37 years        | 153 (56.7) |
|                   | 38-57 years        | 94 (34.8)  |
|                   | 58-77 years        | 23 (8.5)   |
| Marital Status    | Married            | 159 (58.9) |
|                   | Unmarried          | 108 (40.0) |
|                   | Divorced           | 3 (1.1)    |
| Family Type       | Nuclear            | 198 (73.3) |
|                   | Joint              | 72 (26.7)  |
| Gender            | Male               | 155 (57.4) |
|                   | Female             | 115 (42.6) |
| Religion          | Hindu              | 224 (82.9) |
|                   | Islam              | 38 (14.1)  |
|                   | Buddhist           | 5 (1.9)    |
|                   | Sikh               | 2 (0.7)    |
|                   | Jain               | 1 (0.4)    |
| Socioeconomic class* | Upper             | 12 (4.4)   |
|                   | Upper middle       | 39 (14.4)  |
|                   | Lower middle       | 81 (30.0)  |
|                   | Upper lower        | 122 (45.2) |
|                   | Lower              | 16 (5.9)   |

*Revised Kuppuswamy scale 2019[23]

---

**Table 2: Distribution of patients according to treatment details (n=270)**

| Variable        | Category           | No. (%) |
|-----------------|--------------------|---------|
| Type of patient | New                | 199 (73.7) |
|                 | Previously treated | 71 (26.3)  |
| Type of TB      | Pulmonary TB       | 201 (74.4) |
|                 | Extra Pulmonary TB | 69 (25.6)  |
| Phase of treatment | Intensive phase | 175 (64.8) |
|                 | Continuation phase | 95 (35.2)  |
reported that most participants had a tendency to hide the disease status from relatives or neighbors.

In our study, males faced more stigma at workplace compared to females (P-value < 0.05). This was in contrast with the previous studies where females faced higher stigma. Dhingra VK et al.[8], Weiss MG et al.[21], and Balasubramanian R et al.[22] reported that females were more stigmatized compared to males. This is because the majority of females in our study were homemakers and 33% were working females. Again, unmarried/single males worried more than females and expressed issues related to prospects of marriage. This was similar to previous studies, Jaggarajamma et al.[23] reported that 63% expressed such concerns and 19.67% in the study by Padmanabhan N et al.[24] However, a study by Weiss MG et al.[23] reported that such concerns were higher in females. These differences could be due to local cultural practices and social situations related to marriage. Our findings were also supported by a systematic review done by Kane JC et al.[25], which reported that TB-related stigma can impact employment, education, and the marriage prospects of TB patients.

At the workplace, there was a decrease in stigma with an increase in education status, family income, and socioeconomic status.

Table 3: Distribution of patients according to disclosing the condition at workplace and with friends/family

| Variable                          | Category | No. (%) |
|-----------------------------------|----------|---------|
|                                    |          |         |
| Fear of disclosing disease/family  | Yes      | 123 (45.6) |
| (n=270)                           | No       | 147 (54.4) |
| Disclosed their disease/family     | Yes      | 185 (68.5) |
| (n=270)                           | No       | 85 (31.5) |
| Had fear to disclose at workplace  | Yes      | 92 (38.2) |
| (n=158)                           | No       | 66 (41.8) |
| Disclosed at their workplace       | Yes      | 100 (63.3) |
| (n=158)                           | No       | 58 (36.7) |

Table 4: Association between perceived stigma and selected variables (n=270)

| Variables                | Stigma perceived with friends/family (n=270) | P*  | Stigma perceived at work place (n=158) | P*  |
|--------------------------|---------------------------------------------|-----|---------------------------------------|-----|
| Age group                | Yes No. (%)                                 |     | Yes No. (%)                           |     |
|                         | < 30 yrs.                                   |     | 69 (45.1)                             |     |
|                         | 84 (53.9)                                  |     | 153 (100)                             | 0.034 |
|                         | > 30 yrs.                                   |     | 54 (46.2)                             |     |
|                         | 63 (53.8)                                  |     | 117 (100)                             |     |
| Sex                      | Male                                        |     | 72 (46.4)                             |     |
|                         | 83 (53.6)                                  |     | 155 (100)                             | 0.027 |
|                         | Female                                      |     | 51 (44.3)                             |     |
|                         | 64 (55.7)                                  |     | 115 (100)                             |     |
| Religion                 | Hindu                                       |     | 105 (46.8)                            | 0.49 |
|                         | 119 (53.1)                                 |     | 224 (100)                             |     |
|                         | Others                                      |     | 18 (39.1)                             |     |
|                         | 28 (60.9)                                  |     | 46 (100)                              |     |
| Family type              | Nuclear                                     |     | 88 (44.4)                             | 0.31 |
|                         | 110 (55.6)                                 |     | 198 (100)                             |     |
|                         | Joint                                       |     | 35 (48.6)                             |     |
|                         | 37 (51.4)                                  |     | 72 (100)                              |     |
| Education                | Illiterate                                  |     | 38 (44.7)                             | 0.80 |
|                         | 47 (55.3)                                  |     | 85 (100)                              |     |
|                         | Literate                                    |     | 85 (45.9)                             |     |
|                         | 100 (54.1)                                 |     | 185 (100)                             |     |
| SES                      | Upper                                       |     | 29 (56.9)                             | 0.14 |
|                         | 22 (43.1)                                  |     | 51 (100)                              |     |
|                         | Middle                                      |     | 26 (32.1)                             |     |
|                         | 55 (67.9)                                  |     | 81 (100)                              |     |
|                         | Lower                                       |     | 68 (49.3)                             |     |
|                         | 70 (50.7)                                  |     | 138 (100)                             |     |
| Monthly Family income    | ≤ 5000                                      | 0.01 | 21 (70.0)                             | 0.19 |
|                         | 28 (42.9)                                  |     | 49 (100)                              |     |
|                         | > 1000                                      | 0.91 | 56 (46.3)                             |     |
|                         | 65 (53.7)                                  |     | 121 (100)                             |     |
| Marital status           | Married                                     | 0.52 | 75 (47.2)                             | 0.12 |
|                         | Single#                                     |     | 84 (52.8)                             |     |
|                         | 159 (100)                                  |     | 111 (100)                             |     |
| Family members           | < 6                                         | 0.12 | 83 (49.1)                             | 0.90 |
|                         | ≥ 6                                         |     | 86 (50.9)                             |     |
|                         | 169 (100)                                  |     | 101 (100)                             |     |
| Type of TB               | Pulmonary                                   | 0.00 | 95 (47.3)                             | 0.10 |
|                         | Extra                                       | 0.33 | 28 (40.6)                             |     |
|                         | Palmonary                                   |     | 41 (59.4)                             |     |
|                         | 69 (100)                                   |     | 100 (100)                             |     |
| Family H/O TB            | Present                                     | 0.79 | 29 (43.9)                             |     |
|                         | Absent                                      | 0.76 | 37 (56.1)                             |     |
|                         | 66 (100)                                   |     | 104 (100)                             |     |

P* unmaried, divorcee, separated, widowed/widower. Fisher exact test, Chi square test applied, P value < 0.05 is significant.
Lower socioeconomic class faced higher stigma with family and friends (P-value < 0.05). In another study conducted by Duko B et al.[13] in Ethiopia, similar results were found that perceived stigma decreases with an increase in education and job status. A systematic review on tuberculosis stigma also reported that ethnic status and socioeconomic status play an important role in stigmatization.[20] Avoidance by friends was experienced more in subjects belonging to low socioeconomic class. Similar results were found in a study conducted by Aryal S et al.[21] in which stigma was more in patients who were illiterate and with low family income (P < 0.05). Datiko DG et al.[22] in their study done in Ethiopia also revealed that higher education level and income level were associated with low TB-related stigma. Thus, literacy plays a crucial role in understanding the disease prospects, which is proven by study findings.

A patient-centered care approach was found to be an essential element in tackling tuberculosis. In order to provide patient-centered care, addressing stigma should start from the beginning of diagnosis, and the role of primary care physician is crucial.[23] Identification of stigma and addressing the stigma for better compliance in drug treatment, thereby improves the treatment outcome and also prevents further transmission of disease.

The strength of the present study is that stigma perceived with family/friends and at the workplace was studied, and its association with demographic profile was determined. Around forty-five percent of study participants perceived stigma with family/friends and participants belonging to a lower socioeconomic class faced higher stigma. Fifty-eight percent of study participants perceived stigma at workplace and younger patients (<30 years) and males were higher among them.

**Conclusion**

In this study, perceived stigma found to be high with family/friends (45.5%) and at workplace (58.2%). More than half of TB patients feared disclosing their disease status at the workplace. TB patients faced avoidance by friends and family due to their disease. Young patients (<30 years), males faced higher stigma at workplace. At workplace, stigma was decreasing as education, income, and the socioeconomic class were increasing. Lower socioeconomic class faced more stigma with family and friends. It is clearly evident that there is still higher stigmatization faced by patients with TB at family/friends and at the workplace. Support to TB patients from family, friends, and at workplace may facilitate successful treatment outcomes. Active planning such as sensitization of family, community awareness about the disease, and emotional support by family/friends to TB patients are deemed necessary for reducing stigma against TB.

**Acknowledgment**

We acknowledge all patients, DOTS providers, and treatment supervisors who helped to conduct the study.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Raviglione MC, O’Brien RJ. Tuberculosis. In: Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, editors. Harrison principle of internal medicine of medicine. 17th ed. New York, USA: McGraw Hill; 2016.
2. World Health Organization. Global Tuberculosis Report 2019. Geneva. Available from: https://www.who.int/tb/publications/global_report/en.
3. Central TB Division; TB India 2019, RNTCP Annual Status Report. New Delhi: Ministry of Health and Family Welfare, Govt. of India; 2019.
4. Central TB Division; From TB survivors to TB champions: A training curriculum. New Delhi: Ministry of Health and Family Welfare, Govt. of India; 2019.
5. Goffman E. Stigma: Notes on the management of spoiled identity. New York, USA: Simon and Schuster; 2009. 164 p.
6. World Health Organization. The World Health Report 2001: Mental Health : New Understanding, New Hope. World Health Organization; 2001. 206 p.
7. Dhingra VK, Khan S. A sociological study on stigma among TB patients in Delhi. Indian J Tuberc 2010;57:12-8.
8. Anand T, Kumar DA, Sharma N, Saha R, Krishnamurthy L, Singh SV, et al. Perception of stigma towards TB among patients on DOTS & patients attending general OPD in Delhi. Indian J Tuberc 2014;61:35-42.
9. Rajeswari R, Muniyandi M, Balasubramanian R, Narayanan PR. Perceptions of tuberculosis patients about their physical, mental and social well-being: A field report from south India. Soc Sci Med 2005;60:1845-53.
10. Qiu L, Tong Y, Lu Z, Gong Y, Yin X. Depressive symptoms mediate the associations of stigma with medication adherence and quality of life in tuberculosis patients in China. Am J Trop Med Hyg 2019;100:31-6.
11. Atre SR, Kudale AM, Morankan SN, Rangan SG, Weiss MG. Cultural concepts of tuberculosis and gender among the general population without tuberculosis in rural Maharashtra, India. Trop Med Int Health 2004;9:1228-38.
12. Aryal S, Badhu A, Pandey S, Bhandari A, Khatiwoda P, Khatiwada P, et al. Stigma related to tuberculosis among patients attending DOTS clinics of Dharan municipality. Kathmandu Univ Med J 2012;10:40-3.
17. Rie VA, Sengupta S, Pungrassami P, Balthip Q, Choonuan S, Kasetjaroen Y, et al. Measuring stigma associated with tuberculosis and HIV/AIDS in southern Thailand: Exploratory and confirmatory factor analyses of two new scales. Trop Med Int Health 2008;13:21-30.
18. Craig GM, Zumla A. The social context of tuberculosis treatment in urban risk groups in the United Kingdom: A qualitative interview study. Int J Infect Dis 2015;32:105-10.
19. Liefooghe R, Michiels N, Habib S, Moran MB, De Muynck A. Perception and social consequences of tuberculosis: A focus group study of tuberculosis patients in Sialkot, Pakistan. Soc Sci Med 1982 1995;41:1685-92.
20. Yellappa V, Lefèvre P, Battaglioli T, Narayanan D, Van der Stuyft P. Coping with tuberculosis and directly observed treatment: A qualitative study among patients from South India. BMC Health Serv Res 2016;16:283.
21. Weiss MG, Somma D, Karim F, Abouihia A, Auer C, Kemp J, et al. Cultural epidemiology of TB with reference to gender in Bangladesh, India and Malawi. Int J Tuberc Lung Dis 2008;12:837-47.
22. Balasubramanian R, Garg R, Santha T, Gopi PG, Subramani R, Chandrasekaran V, et al. Gender disparities in tuberculosis: Report from a rural DOTS programme in south India. Int J Tuberc Lung Dis 2004;8:323-32.
23. Jaggarajamma K, Ramachandran R, Charles N, Chandrasekaran V, Muniyandi M, Ganapathy S. Psycho-social dysfunction: Perceived and enacted stigma among tuberculosis patients registered under revised national tuberculosis control programme. Indian J Tuberc 2008;55:179-87.
24. Padmanabhan N, Poornima S. A study to assess the stigma related to tuberculosis among directly observed treatment short-course (DOTS) providers and patients on DOTS therapy attending DOTS centres of Mandya. Int J Community Med Public Health 2016;3:2817-24.
25. Kane JC, Elafros MA, Murray SM, Mitchell EM, Augustinavicius JL, Causevic S, et al. A scoping review of health-related stigma outcomes for high-burden diseases in low- and middle-income countries. BMC Med 2019;17:17.
26. Craig GM, Daftary A, Engel N, O'Driscoll S, Ioannaki A. Tuberculosis stigma as a social determinant of health: A systematic mapping review of research in low incidence countries. Int J Infect Dis 2017;56:90-100.
27. Datiko DG, Jerene D, Suarez P. Stigma matters in ending tuberculosis: Nationwide survey of stigma in Ethiopia. BMC Public Health 2020;20:190.