International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume: 3 | Issue: 4 | May-Jun 2019 Available Online: www.ijtsrd.com e-ISSN: 2456 - 6470

Myths, Realities and Prejudices about Factors Associated with Loss to Follow Up, Relapse and Treatment Failure in Tuberculosis Patients: A Qualitative Study

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How to cite this paper: Puneet Kaur | Dr Sukhpal Kaur | Dr Amarjeet Singh | Dr Sandhya Ghai "Myths, Realities and Prejudices about Factors Associated with Loss to Follow Up, Relapse and Treatment Failure in Tuberculosis Patients: A Qualitative Study" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-3 | Issue-4, June 2019, pp.1315-1321, URL: https://www.ijtsrd.com/papers/ijtsrd25078.pdf

IJTSRD25078

ABSTRACT

Background: There are numerous public health and clinical consequences of incomplete TB treatment. The patients develop resistance to first line ATT drugs. Treatment with second-line drugs are less successful and more toxic. Relapse and treatment failure are also an important problem because patients can harbor drug resistant mycobacterium tuberculosis bacilli.

Objective: To explore the patients' perspective about factors associated with loss to follow up, relapse and treatment failure in tuberculosis patients.

Materials and Methods: This phenomenological study was conducted on 12 patients registered at DOTS centers, U.T. Chandigarh. A pre validated semi structured interview guide was used to collect the data. In-depth interviews were conducted. Audio recording was done following permission from the participants. Principle of redundancy was followed for data collection.

Results: Based on patients' verbatim, 12 themes were formulated. These were Factors contributing to relapse, Factors contributing to loss to follow up, Factors contributing to relapse, Physical problems related to disease conditions, Emotional stress, Stigma related to disease, Economic challenges, Job related challenges, Family support, Health care system related challenges, Attitude of DOTS Providers, Expectations of National Programme.

Conclusion: This study has demonstrated many factors responsible for loss to follow up, treatment failure and relapse in TB patients. Although medicines are provided free of cost but side effects of medicines and pills burden can be a disabling factor in completion of treatment. In congruence with this, low socio-economic status, stigma related to disease condition, family liabilities, awareness issues, economic challenges, burden of losing income from work contributes to non-compliance. Occupational exposure of irritants, addictions, imbalanced diet, non compliance to treatment contributes treatment failure and relapse of disease.

Keywords: *Tuberculosis, Loss to follow up, Relapse, Treatment failure, Care givers, DOTS providers*

Introduction:

Tuberculosis is a communicable, lethal disease (if not treated) caused by Mycobacterium Tuberculosis. It mainly attacks lungs but can also infect other parts of the body. The bacterial agent, Mycobacterium Tuberculosis is an acid-fast aerobic rod. The bacteria grow slowly and are sensitive to heat and ultraviolet light.[1]

People who have latent TB infection have no symptoms and cannot spread infection2. Most tubercular infections results in an asymptomatic, latent infection. One in ten latent infections in due course of time progresse to active disease.

The transmission of TB is influenced by multiple factors. It includes infectious status of patient, exposure, host factors and environmental conditions where patients live. Other determinants which can increase the risk of progression to active disease are diabetes mellitus, alcohol abuse, smoking, tobacco products and malnutrition. [2]

Global epidemiology of tuberculosis

Tuberculosis infects an estimated one third of the world's population. Along with HIV, it is one of the leading causes of death from communicable diseases globally. Despite the availability of effective anti tubercular drugs, TB killed 1.3 million people in 2012. The new infections occur at a rate of about one per second[3]

According to WHO global TB report 2017, in 2016, there were an estimated 10.4 million new TB cases worldwide. Seven countries accounted for 64% of the total burden, with India having the maximum number of TB patients, followed by Indonesia, China, Philippines, Pakistan, Nigeria and South Africa, the report said.[4]

Tuberculosis in India

India accounts for one fourth of the global TB burden i.e. 2.2 million out of 9.6 million new cases annually. In India, more than 40% of population is infected (prevalence of infection) with Mycobacterium Tuberculosis. It is estimated that there are 2.5 million prevalent cases of all forms of TB disease. There are about 2.2 lakh people die due to TB annually (mortality). (RNTCP Guidelines, 2016)[5]

TB kills more adults in India than any other infectious disease. In India, every day:

- More than 6000 people develop TB disease
- More than 600 people die of TB (i.e. 2 deaths every 5 minutes)[5]

Revised National Tuberculosis Health Programme

In 1997, Revised TB Control Programme (RNTCP) was launched which formulated and adopted the internationally recommended Directly Observed Short Course (DOTS) strategy as the most systemic and cost-effective approach to revitalize the TB control programme in India.

The objectives of RNTPCP were to achieve at least 85% cure rate among the new smear-positive cases initiated on treatment and thereafter a case detection rate of at least 70% of such cases. The first technical and operational guidelines for RNTCP were developed during the initial years of implementation of the programme and were updated in 2005.[6]

The goal of the national strategic plan is to achieve universal access of quality of TB diagnosis and treatment of all TB patients in the community. The objectives of national strategic plans are:

1. To achieve 90% notification rate for all cases
2. To achieve 90% success rate for all new and 85% for re-treatment cases
3. To significantly improve the successful outcome of treatment for DRTB cases
4. To achieve decreased morbidity and mortality for HIV-associated TB cases
5. To improve the outcome of TB care in the private sectors.[7]

Challenges in Revised National Tuberculosis Control Program

In India, under the (RNTCP), the percentage of smear-positive re-treatment cases is high. Under the Revised National Tuberculosis Control Program (RNTCP), the percentage of smear-positive re-treatment cases out of all smear-positive cases is 24%.[8] The causes of re-treatment include relapse of the disease after successful completion of treatment, treatment failure, and default in treatment. RNTCP does not follow up the patients for any period of time after successful completion of treatment to determine whether they relapse. Given the high cost of treatment for each patient under RNTCP and the potential for spread of disease from these patients, it is crucial for the success of the program and control of the disease in the country to find out more about the reasons behind this.[9]

Loss to follow up in TB patients

It is defined as a TB patient previously treated for TB for one month or more and who was declared lost to follow-up in their most recent course of treatment and subsequently found microbiologically confirmed TB cases. [10]

Poor adherence contributes to worsening of TB situation not only by increasing incidence but also by initiating drug resistance. Resistance to anti-TB drugs has become a serious obstacle in the control of the disease. Patients' poor adherence to anti-TB therapy, with an estimate of as low as 40% in developing countries, remains the principal cause of treatment failure globally.[11] The WHO recommends at least 85% cure rate of all diagnosed TB cases.[12] In order to achieve this cure rate, adherence needs to be in the order of 85–90%.[13] Lack of access to formal health services, traditional beliefs leading to self-treatment, loss of income, lack of social support, drug side effects, pill burden, lack of food, stigma with lack of disclosure, and lack of adequate communication with health professionals are some of the factors that can lead to loss to follow up in patients.[14]

Relapse

TB relapse is defined as a patient who has become (and remained) culture negative while receiving therapy but after completion of therapy becomes:

1. Culture positive again or
2. Has clinical or radiographic deterioration that is consistent with active tuberculosis.[15]

Most relapses occur within the first 6–12 months after completion of therapy. Patients who received self-administered therapy or a non-Rifampicin regimen the risk of acquired drug resistance is substantial. The outcome of relapse cases put on treatment is positive but less effective than new cases. [15]

Risk factors for relapse included drug irregularity, initial drug resistance, smoking, and alcoholism, shorter total duration of treatment (particularly Rifampicin), poor adherence during treatment (mainly during intensive phase), use of fewer than three drugs in intensive phase, greater disease severity and cavitations, high bacterial load, smoking, being male, the presence of concomitant disease, being underweight, and infection with HIV.[16]

The outcome of relapse patients put on treatment is positive in terms of cure in the majority of cases but clearly less effective than the results of DOTS for new TB cases never treated before.[16]

Treatment failure

Treatment failure is the presence of continued or recurrently positive cultures during the course of anti-tuberculosis therapy. After 3 months of multi-drug therapy for pulmonary tuberculosis caused by drug susceptible organisms, 90–95% of patients will have negative cultures and show clinical improvement. All patients with positive cultures after 3 months of appropriate treatment must be evaluated carefully to identify the cause of the delayed conversion. Patients whose biological specimen is positive by smear or culture at the end of the treatment are considered at treatment failure. [15]

There are many reasons for treatment failure in patients receiving appropriate regimens. These include: Non-adherence, drug resistance, malabsorption of drugs, laboratory error and a few patients take a long time to respond as part of extreme biological variation.18These retreatment conditions are an important issue as patient's can harbor resistant mycobacterium tuberculosis bacilli. They can lead to health and economic burden in the

community, as it is attributed to absence from work and inability to work.

Objective:
To explore the patients' perspective about factors associated with loss to follow up, relapse and treatment failure in tuberculosis patients registered at U.T. Chandigarh.

Material and Methods:
Qualitative research approach was used in the study, because it is based on the realities, experiences and view points of the tuberculosis patients. Phenomenological research design is selected to explore the lived experiences of loss to follow up, relapse and treatment failure tuberculosis patients'.

This study was conducted at DOTS Centres in various health settings in U.T Chandigarh. Eight DOTS Centres were selected from 4 tuberculosis units, based on number of patients registered and population size to cover major part of U.T Chandigarh. Quarterly reports of patients census were collected from State TB officer, Sec 34 and two DOTS Centres from each TB unit were selected for data collection to cover U.T. Chandigarh. The research study was conducted in the months of July -Sept 2017.

Purposive Sampling technique was used to draw samples for the present study. A pre validated semi structured interview guide was used to collect the data. In-depth interviews were conducted. Audio recording was done following permission from the participants. Principle of redundancy was followed for data collection. Patients who were not traceable and who had at extensive dyspnoea were excluded from the study.

The tools used for data collection were developed through extensive literature search, consultation with experts in the field of pulmonary medicine, public health and nursing education and researcher's experience in the field of tuberculosis. Tools used for the study were interview schedule consisting of socio demographic data sheet clinical profile and semi structured in-depth interview guide for patients.

Ethical clearance for the study was obtained from the Institute Ethical Committee, PGIMER, Chandigarh and state TB Officer, RNTCP, Chandigarh. An informed written consent was obtained from the study subjects after explaining the objectives and duration of their involvement.

Data collection was done at the DOTS centres UT, Chandigarh. Patients were interviewed on Monday, Wednesday, Friday i.e. on DOTS day between 8am-2pm as they come to DOTS centres for their medicines. Quiet and separated room was selected at DOTS Centres to carry out in-depth interviews. Subjects were made comfortable and rapport was developed by asking warm up questions i.e. about their well being and personal information. Interviews were recorded by using audio tape recorder. On an average, the time spent for each interviews varied from 25-30 minutes, according to the willingness of the client to talk.

Data analysis and interpretation:
Written and audio taped descriptions through in-depth interview were the source of data in this study. Analysis was done by using descriptive statistics and colaizzi's steps for analysis which includes reading and re-reading of participant's description, extracting significant statements, formulating meaning for each statement, categorizing formulated meanings into cluster of themes, integrating findings into exhaustive description of phenomenon, validating with paticipants and final description into essence of phenomenon.

Results:
Based on patients' verbatims, 12 themes were formulated. These were Factors contributing to relapse; Factors contributing to loss to follow up; Factors contributing to relapse; Physical problems related to disease conditions; Emotional stress; Stigma related to disease; Economic challenges; Job related challenges; Family support; Health care system related challenges; Attitude of DOTS Providers; Expectations of National Programme. Each theme was further divided in to various sub-themes to categorize the information more appropriately.

Sub-Themes under each theme

1. **Factors contributing to relapse**
   a. Addictions
   b. Occupational exposure
   c. Imbalanced diet
   d. Not following prescribed regimen
   e. Non adherence to medications

2. **Factors contributing to treatment failure**
   a. Imbalanced diet
   b. Addictions
   c. Non adherence to medicines

3. **Physical problems related to disease**
   a. Physical weakness
   b. Loss of efficiency in doing household work
   c. Difficulty in taking care of children

4. **Emotional stress related to disease**
   a. Stress related to disease
   b. Repeat medication
   c. Alteration in daily routine
   d. Fear of not getting married

5. **Stigma related to disease**
   a. Isolation of patient
   b. Avoidance of patients participation in social activity
   c. Criticism from family members
   d. Decreased traveling to relatives place

6. **Economic challenges**
   a. Limited income sources
   b. Unemployment related to disease
   c. Non affordability of balanced diet

7. **Job related challenges**
   a. Extra leaves
   b. Salary deduction
   c. Fear of loss of job

8. **Family support**
   a. Motivation
   b. Assistance in household work
   c. Diet supplementation
   d. Escort patient to DOTS Center
   e. Financial support

9. **Health care system related factors**

a. Proximity of DOTS Center
b. Proper verification of patients documents
c. Less waiting time for medications

10. Attitude of DOTS Provider
a. Positive
b. Supportive and friendly attitude
c. Proper counseling related to treatment and diet

11. Negative
a. Negligence in providing treatment

12. Expectations from National Programme
a. Reduce number of pills
b. Treatment at nearest DOTS Center
c. More awareness regarding disease and treatment
d. Nutritional support
e. Financial support
f. No medicines for home during CP phase

Discussion:

The present study has been one of the very few research endeavors to identify factors associated with loss to follow up, relapse and treatment failure as per patients' perspective. Researcher wanted to gain insight into their thoughts, feelings and problems, so phenomenology design was selected as a medium to enter into their private world. The study identified the various factors which are responsible for loss to follow up, relapse and treatment failure according to patients.

Factors affecting compliance to TB treatment

Medicines related factors

The treatment non-compliance is recognized as one of the major challenges in achieving TB control. Medicines related issues like side effects of medicines, pill burden were responsible for non-adherence to treatment. In India traditional medicine system is deeply rooted. Patients generally have notion that allopathic medicines are hot in nature and will make them sicker. Patients usually go to traditional healers and take ayurvedic medicines when they feel sick. One of patient reported *"I could not take TB medicines as I was not able to swallow them. Medicines are very thick; they cause acidity and irritation in my stomach. I couldn't tolerate the suffocation and ghabrahat because of medicines, so I left the treatment in between." Other patient reported that ''My fever was down and cough was relieved, appetite was also improved. I missed medicines once or twice and I did not take my medicines. I did not go to take medicines." On contrary some patients left treatment in between as they didn't feel improvement in their condition. "After taking medicines my condition got worse. Earlier I had no fever but I used to get high grade fever after taking medicines. I was getting sicker that's why I left the treatment in between."*

Similar findings were shown in study a by Federick 17 which revealed that major factors leading to non-compliance included patients beginning to feel better (45.1% and 38.6%), lack of knowledge on the benefits of completing a course (25.7%), running out of drugs at home (25.4%) and TB drugs being too strong (20.1% and 20.2%).

Study by Boru in Ethopia (2014) revealed that many patients were unable to adhere to their treatment because of one or a combination of the following factors; lack of adequate food, poor communication between healthcare providers and patients, beliefs in traditional healing system, unavailability of the service in nearby health facilities, side-effect and pill burden of the drugs, stigma and discrimination. The patients take their anti-TB medications under difficult circumstances and experienced a wide range of interacting factors.[14]

Disease related factors

Physical problems related to disease contributed to non compliance to treatment. Patients had role limitations due to physical problems, bodily pain, and decreased vitality. Women had burden of house care, child care and employment which was obstacle in gaining access to diagnostic facility and completing their adequate treatment. One of patient responded *"My body has become loose. I feel weak. I don't feel like working, if family members are not at home then I can't go to DOTS Centre for treatment alone.* Due to disease condition patients feel weak and if they don't have support system in family then they don't travel to DOTS centre for their treatment.

Similar findings were reported in a study by Guo [18] which showed that quality of life aspects affected by TB included physical functioning and emotional/mental well-being.

Finance related factors

Tuberculosis affects the most productive age group and the resultant economic cost for the society is high. This disease has considerable impact on patient's household's in terms of income, health, education and nutrition, particularly if patient is a wage earner. Socio-economic factors were also important contributory factors to non-compliance to treatment. The financial constraints that recognized through lack of money, unemployment due to disease, transportation cost, food has been continued to exert their influence on TB patients. One patient stated *"We really have dirth of money. I used to work as a sweeper at sec 32 hospital, now I can't work because of disease. My wife is working as a sweeper in PGI .One daughter is studying in school. I have one son of 22 yrs old, he doesn't work. It is very difficult to earn living for us."*

Majority of patients were unemployed due to disease and dependent on their family members for their living. They had to borrow money to meet their daily expenses. *"My body has become wasted because of TB. I can't work because of weakness. I left work 3 months before. Now it is very difficult for us to earn our living. We borrow money to manage our household expenses." They couldn't arrange balanced diet for them due to poverty, which is required for better treatment outcomes."We have financial problems. If I want to eat anything then I have to think before buying it. I can't spend money on my diet. At times I have to eat chappati with salt.''*

Patients who were employed faced challenges at work as they had to take extra leaves for treatment and investigation. Their salary got deducted at they got scolding from their supervisors for their irregularity at work."Many *times I have to take leave from work, if I have to go for test. My boss scolds me if I take extra leaves." Other patient responded that "My salary gets deducted if I take leaves. I get less salary because of deduction. I can't work actively. Sometimes I don't want to work if I am not feeling well. I face problems if my work is pending. "*

A study conducted by Rajeshwari [19] revealed that the total costs, and particularly indirect costs due to TB, were

relatively high. The average period of loss of wages was 3 months. Care giving activities of female patients decreased significantly.

Awareness Issues

Lack of knowledge and Misconceptions about transmission of disease lead to discrimination like separate utensils for food or drink. Diagnosis of TB is associated with increase anxiety/tension, fear of loss of wage/earning, and stigma threatening self-esteem and quality of life. Present study showed that there was knowledge deficit in patients and care givers related to disease and course of treatment. *"I just know that TB is a disease in which we have to take precautionary measures. It can be fatal if it spreads. I don't know about how this disease occurs and spreads."* They were not aware about the factors responsible for causation and transmission of TB infection. "TB spreads by virus. It spreads if we talk to patients. *We should not go near TB patients."* There was knowledge gap related to the course and duration of treatment. They also did not have information about the need and importance of adherence of medicines in patients.

Study by Chinnakali revealed that out of 395 paricipants, 370 (94%) respondents had heard about TB. Regarding the symptoms of TB, 82% were aware that cough is a symptom of TB. Among the 79% of study subjects who reported any test to diagnose TB, sputum examination as a method of diagnosis was known to only 40%. However, 84% of the subjects were aware of the free treatment available for TB under National program.[20]

Stigma related to disease

Despite being curable, tuberculosis is still a stigmatized disease. Not only is TB patients' suffering due to its clinical manifestations, but also because of society's prejudice, embarrassing situations, and even self-discrimination. The study revealed that stigma related to disease was very much prevalent in society. Patients were kept isolated from other family members. One patient reported *"I stay in isolation. My room is separate. I don't sit and lie down with anyone in summers and winters. I don't eat with anyone. My utensils and clothes are separate from other family members."*

Patients usually avoided participation in social activity because of stigma related to TB *" I really feel bad when there is some marriage in my family, they don't call me for any function. They stay away from me as if I am having Leprosy. I really don't like it, then my husband counsel and console me that you don't worry, you will be fine."* They had feeling of worthlessness and hopelessness due to disease condition.

There were conflicts in their family due to disease and they faced criticism from family members. *"Every time they criticise me that this might not have been happened, if I would have taken complete treatment. They say we don't have time to get you treated, we also face problems. My mother in law doesn't have any concern for me."*

Patients also reported that they didn't disclose their TB status at office as they feared of losing their job because of their TB status. *"I feel scared that because of TB I may lose my office friends. They may get drift away from me. I fear I may lose my job as well."*

Female patients had a fear of not getting married because of the disease. They were worried about their future due to stigma and discrimination related to disease. *"Our society has hatred towards tuberculosis. I am tensed that I will get married or not. I get proposals but it doesn't get accepted. This is the reason I have started the treatment all over again. I am taking care of my diet as well."*

Study conducted by Liefooghe revealed that due to fear patients often denied the diagnosis and rejected the treatment. While both male and female TB patients faced many social and economical problems, female patients were more affected. Divorce and broken engagements seemed to occur more often in female patients. Females were usually economically dependent on their husbands and family in law, and needed their cooperation to avail of treatment.[21]

Study by Lima found that TB still causes patients to suffer from fear of transmission, social prejudice, and death. Despite the fact that the emotional support provided by families and healthcare professionals is considered essential to treatment adherence and completion, participants in this study reveal that friends and colleagues have distanced themselves from them for fear of contagion and/or prejudice.[22]

Health care related factors

Health care workers' attitude, clinic opening times, availability of medicines, accessibility issues were important factors contributing for treatment compliance. All the respondents in the study revealed that attitude of health workers was friendly except one who reported that attitude of health worker was unprofessional and unfriendly.

One of the respondents in the study reported that no counselling was given to her related to the treatment and no follow up was planned for her when she was on treatment. She completed 6 months treatment in 4 months as complete box was given to her without any counselling and DOTS was not initiated.*"I have taken complete treatment but I finished my course in 4 months because proper information was not given to me regarding duration of treatment. I finished the course in 4 months instead of 6 months. When I went to return the box they told me not to disclose it to anyone, they said I could have died as I took double doses. They did not run any test nor they came home or called me to DOTS Centre.''*

Study conducted by Bonsu defined service satisfaction as involving education/counselling (on drugs, nature of condition, sputum production, caregivers and contacts of patients), patient follow-up, assignment of reliable treatment supporters as well as being attentive and receptive to patients, service availability (e.g. punctuality at work, availability of commodities), positive assurances about disease prognosis and respect for patients.[23]

Factors contributing for relapse and treatment failure

Smoking, drinking alcohol were the important factors related to relapse and treatment failure. The implications of patients taking alcohol while on treatment are threefold. Firstly, patients may forget to take their medicines under influence of alcohol, secondly there may be more side effects of TB medicines particularly when patients are taking alcohol with treatment. Thirdly there are chances of relapse of disease if patient continues to take alcohol after completion of treatment. *"I got relapse of TB due to my carelessness, I used to drink daily when I was fine and used to do smoking as well."*

"The reason behind relapse of TB is that, I did not leave drinking. I used to drink on non DOTS day. I continued to drink after my recovery. They told me to leave drink but I continued the same without informing them. I made this mistake. "

Exposure to occupational hazards may also have contributed to relapse of disease. Patients reported that job profile and working conditions were responsible for relapse of disease. *"At my work place there is lot of dust, when we do paper cutting there is lot of dust in surroundings. I get bad cough because of this, I do get dyspnea as well. This may be the reason behind relapse of tuberculosis. "Other patient said "It may be due to my job profile, there is lot of dust due to coal when we iron clothes. I get dyspnea because of coal."*

A study conducted by Mlotshwa et al revealed that male gender, HIV co-infection and a >2+ acid fast bacilli (AFB) smear grading at the start of TB treatment were independent risk factors for non-conversion ($p < 0.001$). Age was a risk factor for non-conversion in new cases, but not for re-treatment cases.[24]

A study by Morsy et al revealed that significant risk factors for treatment failure were non-compliance to treatment, deficient health education to the patient, poor patient knowledge regarding the disease and diabetes mellitus as co-morbid condition. [25]

Lack of balanced diet and non adherence to medicines were also reported by patients to contribute to relapse of disease. Patients were not able to eat balanced diet due to socio-economic factors or side effects of medicines like anorexia. One patient reported *"I don't eat proper diet this may be the reason behind relapse of tuberculosis. I can't eat proper diet. Sometimes I don't feel like eating anything."*

Other patient responded *"The reason for relapse is I did not follow the due course of medicines, instead of finishing the course in 6 months I finished in 4 months. I finished the course of medicines much earlier than the due course. After that I did not get myself checked nor did I undergo any test."*

Primary resistance to medicines was a major factor of treatment failure. If a patient is already resistant to anti-tubercular medicines then he will not respond to the current regimen available for TB. Many patients take treatment from private practitioner, traditional healers, quacks which make them resistant to medicines.

Expectations from National Programme

There were several responses from patients when they were asked about their opinion on what could be done to help TB patients. Patients had many expectations from health programme. Majority of patients wanted reduction in pills so that they can take medicines easily and it would decrease side effects of medicines. *"There should be change in medicines, medicines are very heavy and it is difficult for patients to take them. If they can decrease the quantity of medicines then it will be easy for patients to take them."*

In this study patient who had to travel a distance to get treatment wanted his treatment to be started at nearest DOTS Centre. He responded *"I am taking medicines what they are giving me, but I have to travel quite a lot for treatment. No one comes to take medicine by their choice they come when they are unwell. If a person is having fever then only he will rush to doctors. Everyone wants to take treatment from nearby health facility. I wish they start my treatment from nearest health facility."*

Patients wanted government should take more initiative to spread awareness about the disease. They reported that they were not aware about the disease, its mode of spread and treatment. *''They should give correct and clear information regarding TB so that patients develop clear understanding related to disease. Half knowledge is always dangerous. "*

The patient responses highlighted the need to address financial and nutritional support for those who can't afford diet and were unemployed due to disease condition. They appreciated that govt. is doing good by providing free medicines but also emphasized the need for balanced diet with medicines. *"If govt. can provide financial support then, we will be able to buy good diet. Government is doing good by providing free medicines as TB treatment and tests are expensive, but diet is also important with medicines."*

Conclusion:

This study has demonstrated many factors responsible for loss to follow up, treatment failure and relapse in TB patients. Although medicines are provided free of cost but side effects of medicines and pills burden can be a disabling factor in completion of treatment. Lack of adequate food, side-effects, pill burden of the drugs, stigma and discrimination were factors that contributed to poor TB treatment adherence in the study area. In addition to this low socio-economic status, family liabilities, awareness issues and burden of losing income from work contributes to non-compliance. Addictions, imbalanced diet, primary resistance, secondary infection and non compliance to treatment contribute treatment failure and relapse of disease. Patients were knowledge deficit related to spread and treatment of tuberculosis. They need education on TB and importance of DOTS.

References

[1] Smeltzer C Suzanne, Bare G Brenda, Hinkle L Jainice, Cheever H Kerry. Brunner and Suddharth textbook of Medical-Surgical Nursing. 13th Edition. New Delhi: Published by Dorling Kindersley (India) Pvt, Ltd; 2014. P.554-565.

[2] Onyebujoh P, Rook G. Global Trends in Resistance to Antituberculosis Drugs. NEJM [Internet]. New England Journal of Medicine. 2004 [cited 6 November 2016]. Available from: http://www.bing.com/cr?IG=ACD674C608B54DCCA5B2A27CA5610C10&CID=15D818C19DAC611603C5136D9C036037&rd=1&h=gQX1wvYnd09DBPNqi2eZJiBrlqaLBOfIDW52YHKOS2g&v=1&r=http%3a%2f%2fwww.nejm.org%2fdoi%2fref%2f10.1056%2fNEJM20010426344170 6&p=DevEx,5090

[3] WHO.(2016). An expanded DOTS framework for effective tuberculosis control.[online]Availableat:http://www.who.int/tb/publications/expanded_dots_framework/en/ [Accessed 15 Nov. 2016].

[4] Global tuberculosis report [Internet]. World Health Organization. 2018 [cited 22 March 2018]. Available from: http://www.who.int/tb/publications/global_report/en/

[5] India M. TOG Chapter1 Introduction. Ministry of Health and Family Welfare [Internet] Tbcindia.gov.in.2017 [cited 20 November 2016]. Available from: http://tbcindia.gov.in/showfile.

[6] WHO.(2010).Report2009: Global Tuberculosis Control [Internet]. 2017 [cited 20 November2016].Availablefrom:http://apps.who.int/iris/bitstream/10665/44425/1/9789241564069_eng.pdf

[7] RNTCP. Government TB Treatment Education & Care NSP 2012 - 2017 [Internet]. TB Facts.org. 2018 [cited 22 March 2018]. Available from: https://www.tbfacts.org/rntcp/

[8] Azhar GS (2012). DOTS for TB relapse in India: A systematic review. Lung India : Official Organ of Indian Chest Society, 29(2), 147–153. Available from: http://doi.org/10.4103/0970-2113.95320[Accessed 22 Dec. 2016].

[9] Chaudhuri AD. Recent changes in technical and operational guidelines for tuberculosis control programme in India - 2016: A paradigm shift in tuberculosis control. J Assoc Chest Physicians [serial online] 2017 [cited 2017 Jan 22];5:1-9. Available from: http://www.jacpjournal.org/text.asp?2017/5/1/1/196644

[10] Ginsberg A, Spigelman M. Challenges in tuberculosis drug research and development. Nature Medicine. 2007;13(3):290-294. Available from https://www.nature.com/articles/nm0307-290 [Accessed 14 Nov. 2016].

[11] Ginsberg A, Spigelman M. Challenges in tuberculosis drug research and development. Nature Medicine. 2007;13(3):290-294. Available from https://www.nature.com/articles/nm0307-290 [Accessed 14 Nov. 2016].

[12] World Health Organization. Global tuberculosis control; WHO report 2009. Epidemiology, Strategy, and Financing. Geneva, Switzerland; 2009. Available from; WWW.WHO/HTM/TB/2009.411. [Accessed 15 Nov. 2016].

[13] Fox W. Compliance of patients and physicians: experience and lessons from tuberculosis-II. BMJ.1983;287(6385):101-105.Available from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1548343/ [Accessed 17 Nov. 2016].

[14] Gugssa Boru C, Shimels T, Bilal A. Factors contributing to non-adherence with treatment among TB patients in Sodo Woreda, Gurage Zone, Southern Ethiopia: A qualitative study. Journal of Infection and Public Health. 2017;10(5):527-533. Available from https://www.sciencedirect.com/science/article/pii/S1876034117300333 [Accessed 18 Nov. 2016].

[15] BHIVA - 12.0 Management of relapse, treatment failure and drug resistance [Internet]. Bhiva.org. 2018 [cited 22 March 2017]. Available from: http://www.bhiva.org/120Managementofrelapsetre.aspx

[16] Cox HS, Morrow M, Deutschmann PW. Long term efficacy of DOTS regimens for tuberculosis: Systematic review. Br Med J. 2008;336:484–7. Available from: http://www.bmj.com/content/336/7642/484/rapid-responses [Accessed 19 Nov. 2016].

[17] Kaona F, Tuba M, Siziya S, Sikaona L. An assessment of factors contributing to treatment adherence and knowledge of TB transmission among patients on TB treatment. BMC Public Health. 2004; 4(1). Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-4-68[Accessed 23 November 2016].

[18] Guo N, Marra F, Marra C. Measuring health-related quality of life in tuberculosis: a systematic review. Health and Quality of Life Outcomes. 2009;7(1):14. Available from: https://www.ncbi.nlm.nih.gov/pubmed/19224645[Accessed 24 November 2016].

[19] Rajeswari R, Balasubramanian R, Muniyandi M, Geetharamani S, Thresa X, Venkatesan P. Socio-economic impact of tuberculosis on patients and family in India. International journel of Tuberculosis and Lung diseases. 1999 Oct;3(10):869-77. Available from: https://www.ncbi.nlm.nih.gov/pubmed/10524583[Accessed 25 November 2016].

[20] Chinnakali P, Gurumurthy J, Ramakrishnan J, Vasudevan K, Upadhyay R, Panigrahi K. Level of awareness about tuberculosis in urban slums: Implications for advocacy and communication strategy planning in the National program. Lung India. 2013;30(2):139. Available from: http://www.lungindia.com/article.asp?issn=09702113;year=2013;volume=30;issue=2;spage=139;epage=142;aulast=Chinnakali [Accessed 24 November 2016].

[21] Liefooghe R, Michiels N, Habib S, Moran M, De Muynck A. Perception and social consequences of tuberculosis: A focus group study of tuberculosis patients in Sialkot, Pakistan. Social Science & Medicine. 1995; 41(12):1685-1692. Available from: https://www.ncbi.nlm.nih.gov/pubmed/8746868 [Accessed 26 November 2016].

[22] Dias A, Oliveira D, Turato E, Figueiredo R. Life experiences of patients who have completed tuberculosis treatment: a qualitative investigation in southeast Brazil. BMC Public Health. 2013;13(1). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3691587/[Accessed 25 November 2016].

[23] Bonsu F, Afutu F, Hanson-Nortey N, Ahiabu M, Amo-Adjei J. Satisfaction of tuberculosis patients with health services in Ghana. International Journal of Health Care Quality Assurance. 2017; 30(6):545-553. Available from:https://www.emeraldinsight.com/doi/abs/10.1108/IJHCQA-10-2016-0146/ [Accessed 26 November 2016].

[24] Mlotshwa M, Abraham N, Beery M, Williams S, Smit S, Reddy C et al (2016). Risk factors for tuberculosis smear non-conversion in Eden district, Western Cape, South Africa, 2007 - 2013: A retrospective cohort study. BMC Infectious Diseases, [online]; 16(1). Available at: http://dx.doi.org/10.1186/s12879-016-1712-y [Accessed 9 November. 2016].

[25] M. Morsy, H.H. Zaher, M.H. Hassan (2003)et al. Predictors of treatment failure among tuberculosis patientsunder DOTS strategy in Egypt. Eastern Mediterranean Health Journal: [Internet].[cited2018Mar8];9(4)Availablefrom: https%3a%2f%2fwww.researchgate.net%2fpublication%2f308866436_Evaluation_of_treatment_failure_outcome_and_its_predictors_among_pulmonary_tuberculosis_patients_in_Sharkia_Governorate_2013-2014&p=DevEx,5035.