Assessment of Factors Contributing to Noncompliance with Tuberculosis Treatment among Tuberculosis Patients in Selected Areas

Poonam Ingalkar[1], Lata Sukare[2], Pascaline David[3]

Author's Affiliations: [1]M.Sc. Nursing, [2]Professor and HOD, [3]Associate Professor, Department of Medical Surgical Nursing, V.S.P.M. Madhuribai Deshmukh Institute of Nursing Education, Digdoh Hills, Hinna Road, Nagpur, Maharashtra 440019, India.

Corresponding Author: Poonam Ingalkar, M.Sc. Nursing, Department of Medical Surgical Nursing, V.S.P.M. Madhuribai Deshmukh Institute of Nursing Education, Digdoh Hills, Hinna Road, Nagpur, Maharashtra 440019, India.

E-mail: poonamingalkar@gmail.com

Received on 24.10.2019, **Accepted on** 13.11.2019

Abstract

Background: TB is a worldwide public health problem that is closely associated with poverty, malnutrition, overcrowding, substandard housing, and inadequate health care. Mortality and morbidity rates continue to rise; Mycobacterium Tuberculosis infects an estimated one third of the world's populations and remains the leading cause of the death from infectious disease in the world. According to WHO, an estimated 1.6 million deaths resulted from TB in 2005 (WHO, 2007). In 2005 there were 14, 093 reported cases of TB in the United States, a 3.8% decline from the previous year. However, two prevalent public health concerns remain about TB. First is the increase in the number of TB cases attributable to multi-drug resistant organisms (MDR-TB) and extensive drug-resistant organisms (XDR-TB). These forms of TB have been found worldwide and a threat to public health as a potential epidemic that is considered practically untreatable. *Objective:* To assess the factors contributing to noncompliance with tuberculosis treatment among tuberculosis patients in selected areas of the city. *Methodology:* A Non experimental study with descriptive research design is used among 100 Tuberculosis patients with noncompliance to tuberculosis treatment in selected areas of the city and are available at the time of data collection. The Purposive sampling technique is used. Data was collected on total four factors contributing to noncompliance these are patient related factors, health system related factors, disease and medicine related factors and socioeconomic related factors. The collected data was coded, analysed by using descriptive statistics and inferential statistics. *Result:* As perpatient related factors to noncompliance revels that majority of participants have knowledge regarding Antituberculosis drugs, which is given by health care worker. As per health care system related factors data revels that health care facilities are easily available and convenient for them. As per disease and medicine related factors data revels that all participant experience drug related side effect, these are nausea & vomiting & loss of appetite. All participants responded they did not feel better throughout the Antituberculosis treatment therapy. As per socioeconomic related factors data revels that majority of participant had financial problem as their job & salary affected because of illness & treatment. So majority of participant stopped Antituberculosis treatment. *Conclusion:* Non-compliance was found to be influenced by multiple factors like experiencing different side effects of Antituberculosis treatment, not feeling better throughout therapy, fear of social isolation and impact on job & salary which finally affect socioeconomic condition.

Keywords: Tuberculosis; Non-compliance; Antituberculosis treatment.

Introduction

(TB) is one of the most prominent mycobacterial diseases known to humankind; the other is leprosy. Tuberculosis is an infectious disease caused by mycobacterium tuberculosis, it primarily affects the lung parenchyma.[1] It also may be transmitted to other parts of the body, including the meninges, kidneys, bones, and lymph nodes. Tuberculosis is the world's second most common cause of death from infectious disease, after HIV/AIDS.[2]

Background and Need of the study

TB is a worldwide public health problem that is closely associated with poverty, malnutrition, over crowding, substandard housing, and inadequate health care. Mortality and morbidity rates continue to rise; Mycobacterium tuberculosis infects an estimated one third of the world's populations and remains the leading cause of the death from infectious disease in the world. According to WHO, an estimated 1.6 million deaths resulted from TB in 2005 (WHO, 2007).[3]

In 2005 there were 14, 093 reported cases of TB in the United States, a 3.8% decline from the previous year. However, two prevalent public health concerns remain about TB. First is the increase in the number of TB cases attributable to multi-drug resistant organisms (MDR-TB) and extensive drug-resistant organisms (XDR-TB). These forms of TB have been found worldwide and a threat to public health as a potential epidemic that is considered practically untreatable.[4]

Non-adherence to treatment is the patient's inability or refusal to take TB medications according to prescribed by health professional. Similarly lost to follow up is a TB patient who did not start treatment or whose treatment was interrupted for 2 consecutive months or more. Hence, intensive case notification and observing patients while they are taking the medication only are not sufficient to prevent TB treatment non-adherence and lost to follow up. However, well understanding and intervening of associated factors which are influencing TB patients' tolerance ability and promote treatment non-adherence and lost to follow-up is corner stone to good treatment success.[5]

India is a country with highest burden of tuberculosis. If Tuberculosis detected earlier it should be treated completely. But Non–adherence to treatment is a biggest problem in our country, so the investigator is interested to find out the different factors which are contributing to noncompliance with Tuberculosis treatment.

Statement of the Problem

"A descriptive study to assess the factors contributing to noncompliance with tuberculosis treatment among tuberculosis patients in selected areas of the city."

Objectives

- To assess the factors contributing to noncompliance with tuberculosis treatment among
- Tuberculosis patients
- To associate the factors contributing to noncompliance to tuberculosis treatment with demographic variables

Operational definitions

- *Assess:* In this study assess means, to find out the factors contributing to noncompliance with tuberculosis treatment
- *Factors:* In this study, it refers to facts, or influence that contributes to noncompliance with Tuberculosis treatment.
- *Contributing:* In this study, it refers to any behavior, omission of condition that influence noncompliance with treatment
- *Noncompliance:* In this study, it refers to failure or refused to continue tuberculosis treatment.
- *Tuberculosis:* In this study, it refers to causing a infectious disease known tuberculosis
- *Patient:* In this study, it refers to patient who are diagnosed with tuberculosis and who are on Ant tuberculosis drugs but fails to continue treatment

Delimitation

Present study was delimited to:

- Patient who was noncompliance to tuberculosis treatment
- Adult patient
- Selected areas of Nagpur city

Conceptual framework

The conceptual framework selected for the study based on "Rosenstok's and Becker's Health Belief Models[6]"

Assessment of Factors Contributing to Noncompliance with Tuberculosis
Treatment among Tuberculosis Patients in Selected Areas

23

Individual Perception Modifying Factors Likelihood of Action

1) Demoraphic variables-
- •→ Age
- •→ Gender
- •→ Marital status,
- •→ Monthly income,
- •→ Occuption,
- •→ Education

2) Sociopsychological variable-
- •→ Family income
- •→ Occupation
- •→ Type of family
- •→ Residence
- •→ Personal habits

Perceieved susceptibility-

Participants feels the high risk of drug resistance if treatment is not taken properly.

Perceieved seriousness

Participant percieved that tuberculosis is a serious disease and if treatment is not continued then there is risk of drug resistance and different complications

Perceived threat of disease-

Participant perceieved threat of tuberculosis if regular treatment not taken.

Cues to action

Internal- side effects of Antituberculosis treatment like:
- •→ Nausea & vomiting
- •→ Loss of appetite
- •→ Skin Rashes
- •→ Visual disturbance
- •→ Abdominal pain
- •→ Diarrhea
- •→ Numbness and pain in hands and feet
- •→ Hearing problems

External -
- •→ Mass media (TV,newspaper, etc)
- •→ Advice from health workers support from family and

Perceived bene? ts of action-

Participant taking regular Antituberculosis treatment, nutritious diet, regular follow up, good personal habits

Perceived barrier to action-

A) Patient related factors-
Personal habit like alcohol, smoking, Patient literacy, Knowledge of tuberculosis disease and treatment

B) Health care system related factors- nonconvenient clinic timing, Long distance to health facilities, cost of transport, irregular follow up, avaibility of Antituberculosis drugs, attitude of health care workers

C) Disease and medicine related Factors- Long duration of treatment fear of being isolated by friends or relatives, Medicine side effects

D) Socioeconomic related factors- lack of supporter, financial burden, impact on job and salary, inadequate food intake

Likelihood of taking recommended preventive and promotive health action:(continuing treatment regimen, and seeking professional help when required)
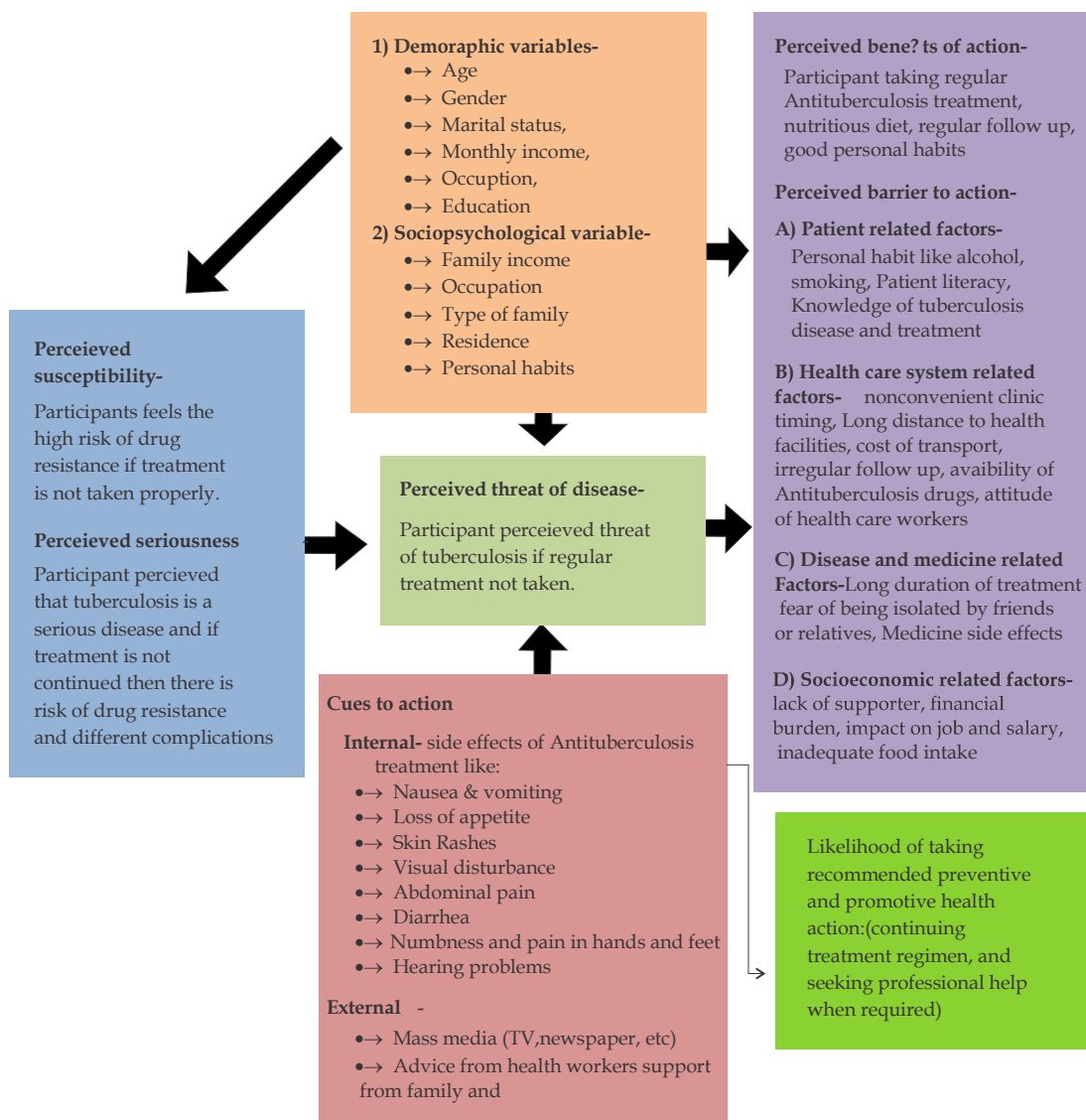
Fig. 1: Conceptual framwork based on rosenstok's and becker's health belief models.

Materials and Methods

Research approach: Quantitative research approach.

Research Design: Descriptive cross sectional research design

Setting of the study: Selected areas of Nagpur city.

Variables

Research variable: Factors contributing to noncompliance with tuberculosis treatment among tuberculosis patients.

Demographic variables: Age, gender, marital status, monthly family income (in rupees), occupation, Type of family, composition of family, residence.

Population: All Tuberculosis patients

Target Population: Tuberculosis patients with noncompliance to tuberculosis treatment

Accessible Population: Tuberculosis patients with noncompliance to tuberculosis treatment in selected areas of the city and are available at the time of data

collection.

Sample Size: 100 Tuberculosis patients, who fails to continue Tuberculosis treatment.

Sampling technique: Purposive sampling technique.

Sampling criteria

Inclusion criteria: Inclusive criteria was

Tuberculosis patients who are;

1. Not taking regular tuberculosis treatment
2. Willing to participate in the study
3. Available at the time of data collection

Exclusion criteria: Exclusion criteria was,

Tuberculosis patients who are;

1. On regular tuberculosis treatment
2. Completed tuberculosis treatment successfully

Tool and technique of data collection

The tools used in this study consist of 3 sections:

Section I: Semi structured questionnaire on demographic variable:

Section II: Questionnaire on Clinical data

Section II: Semi-structured questionnaire on Factors contributing to non-compliance include:

(a) Patient related factors
(b) Health care system related factors
(c) Disease and medicine related factors
(d) Socio economic related factors

Validity: For the content and construct validity of the tool was done by 27 experts. Tool was valid for

the study.

Pilot study: Conducted for 10 days. The investigator approached the 16 sample individually. The pilot study was feasible in time, money, material, and resources.

Ethical: Permission was taken from higher authority from different tuberculosis center from city.

Procedure for data collection

1. Permission was taken from higher authority from different tuberculosis centre from city.
2. List and address of patient who are not taking regular treatment is collected from tuberculosis centre.
3. Investigator personally contacted the participant at their residential area.
4. Purposive sampling done to select the participants as a subject for study.
5. Before collecting the data, self-introduction was done by the investigator and the purpose of the study was explained.
6. Consent of the participants was taken.
7. Collection of the data by questionnaire schedule on demographic variables, clinical data, and data related to factors contributing to noncompliance.
8. The questionnaire was distributed and collected back.

Results

The analysis and interpretation is given in the following sections.

Section I: Description on demographic variable of

Table 1: Table showing percentage wise distribution of non-compliance tuberculosis patients according to their demographic characteristics

N = 100

S. No	Demographic Variables		Frequency (*n*)	Percentage (%)
1.	**Age (in years)**	20–30 years	41	41.0
		31–40 years	23	23.0
		41–50 years	16	16.0
		51–60 years	14	14.0
		61 and above	6	6.0
2.	**Gender**	Male	83	83.0
		Female	17	17.0

(Contd.)

Assessment of Factors Contributing to Noncompliance with Tuberculosis
Treatment among Tuberculosis Patients in Selected Areas

25

S. No	Demographic Variables		Frequency (n)	Percentage (%)
3.	Marital status	Married	59	59.0
		Unmarried	38	38.0
		Divorced	0	0.0
		Separated	0	0.0
		Widow	3	3.0
4.	Educational status	Primary	1	1.0
		Secondary	28	28.0
		Higher secondary	62	62.0
		Graduate	9	9.0
		Post graduate	0	0.0
		Other	0	0.0
5.	Occupational status	Labour	21	21.0
		Farmer	0	0.0
		Service	7	7.0
		Self employed	21	21.0
		Unemployed	49	49.0
		Others	2	2.0
6.	Monthly family income (₹)	<10000 Rs	54	54.0
		₹10001–15000	44	44.0
		₹15001–20000	2	2.0
		>₹20000	0	0.0
7.	Type of family	Nuclear family	35	35.0
		Joint family	65	65.0
		Extended family	0	0.0
8.	Residence	Rural	23	23.0
		Urban	62	62.0
		Semi urban	15	15.0

the participant of noncompliance to tuberculosis treatment

Section II: Description on clinical data of participant of noncompliance tuberculosis patient

Table 2: Table Showing percentage and frequency wise distribution of noncompliance tuberculosis patients according to their clinical data

n = 100

S. No	Questions		Frequency (n)	Percentage (%)
1.	Do you have family history of tuberculosis?	Yes	22	22.0
		No	78	78.0
2.	Do you have history of any past medical illness?	Yes	22	22.0
		No	78	78.0
3.	If yes, then specify?	Diabetics	3	13.63
		Hypertension	6	27.27
		Thyroid	1	4.54
		Both diabetic and hypertension	1	4.54
		Cardiac	3	13.63
		Other	8	36.67
4.	Are you taking any medicine, other than Anti tuberculosis drugs?	Yes	23	23.0
		No	77	77.0

(Contd.)

S. No	Questions		Frequency (n)	Percentage (%)
5.	If yes, to the above question then which medicine you are taking? (specify)	Cardiac	3	13.04
		Psychiatric	6	26.09
		Anti –hypertensive	1	4.34
		Diabetic	3	13.04
		Other	10	43.48

Section III: Description on factors contributing to   tuberculosis patient noncompliance to tuberculosis treatment among

A: Patient related factors

Table 3A: Table showing the frequency and percentage wise distribution on factors contributing to noncompliance to tuberculosis treatment among tuberculosis patient

n = 100

Sr. no	Questions		Frequency (n)	Percentage (%)
1.	Have you smoked cigrettes in the last 6 months?	Yes	2	2.0
		No	88	88.0
		Left	10	10.0
2.	Did you drink alcohol?	Yes	9	9.0
		No	50	50.0
		Left	41	41.0
3.	Do you have knowledge about Anti tuberculosis drugs?	Yes	87	87.0
		No	13	13.0
4.	If yes, from where you got information about Anti tuberculosis drugs?	Family	6	6.0
		Television	0	0.0
		Internet	0	0.0
		Health care workers	81	81.0
		Others	0	0.0
5.	Are you able to take Anti tuberculosis medicine on your own?	Yes	74	74.0
		No	26	26.0

B: Health care system related factors

Table 3B: Table showing the frequency and percentage wise distribution on factors contributing to noncompliance to tuberculosis treatment among tuberculosis patient

n = 100

Sr. No	Questions		Frequency (n)	Percentage (%)
1.	What would be the most convenient time for opening TB clinic?	8 am – 5 pm	34	34.0
		10 am – 5 pm	57	57.0
		2 pm – 8 pm	4	4.0
		24 hours	5	5.0
2.	Is the health care facilitiesfar away from your house?	Yes	8	8.0
		No	92	92.0
3.	How much does it cost you to travel to health clinic?	No cost	4	4.0
		Less than 100 rupees	96	96.0
		101–150 rupees	0	0.0
		More than 150 rupees	0	0.0
4.	Is your medicine easily available?	Yes	100	100.0
		No	0	0.0
5.	Does the health care worker explained you about the treatment modalities and duration of therapy?	Yes	100	100.0
		No	0	0.0

Assessment of Factors Contributing to Noncompliance with Tuberculosis
Treatment among Tuberculosis Patients in Selected Areas

27

Sr. No	Questions		Frequency (n)	Percentage (%)
6.	Who supervised you when you were taking your Anti tuberculosis drugs?	Family members	44	44.0
		Health workers	0	0.0
		Other	0	0.0
		None	56	56.0
7.	How would you rate the attitude of staff who attended you at the health centre?	Excellent	3	3.0
		Very good	33	33.0
		Good	64	64.0
		Poor	0	0.0
8.	How regularly do you follow up with your physician?	Every month	1	1.0
		Once in 3 month	16	16.0
		Once in 6 month	37	37.0
		Any other	46	46.0

C: Disease and medicine related factors

Table 3C: Table showing the frequency and percentage wise distribution on factors contributing to noncompliance to tuberculosis treatment among tuberculosis patient

n = 100

Sr. No	Questions		Frequency (*n*)	Percentage (%)
1.	For how much duration Anti tuberculosis treatment should be continue?	Less than 6 months	14	14.0
		One feels better then stop on your own	24	24.0
		Prescribed course is completed and health worker tells you to stop	61	61.0
		Life long	1	1.0
2.	Did you inform your family or friends that you were on Anti tuberculosis drugs?	Yes	68	68.0
		No	32	32.0
3.	If NO, why?	Fear of being isolated by friends or relative	12	37.5
		No one to trust	0	0.0
		Other	20	62.5
4.	Did you experience any side effects when you are taking Anti tuberculosis drugs?	Yes	100	100.0
		No	0	0.0
5.	If yes to above question, which side effects did you experience? (Mark more than one option)	a) Nausea & vomiting	21	21.0
		b) Loss of appetite	6	6.0
		c) Skin Rashes	3	3.0
		d) Visual disturbance	0	0.0
		e) Abdominal pain	0	0.0
		f) Diarrhea	0	0.0
		g) Numbness and pain in hands and feet	3	3.0
		h) Hearing problems	0	0.0
		i) Any other	0	0.0
		a + b	20	20.0
		a + b + e	3	3.0
		a + b + g	1	1.0
		a + c	8	8.0
		a + c + e	3	3.0
		a + c + g	2	2.0

(Contd.)

Sr. No	Questions		Frequency (*n*)	Percentage (%)
		a + d	2	2.0
		a+ e	12	12.0
		a + g	9	9.0
		b + c	2	2.0
		b + e	2	2.0
		b + g	1	1.0
		c + e	1	1.0
		c + g	1	1.0
6.	From the day you started taking your Anti tuberculosis drugs, how long did it take for you to feel better? (months)	Less than 2	0	0.0
		2–4	0	0.0
		5–6	0	0.0
		Did not feel better	100	100.0
7.	What was the reasons for stopping Anti tuberculosis treatment? (Mark more than one option)	a) Side effects	61	61.0
		b) Feeling well	0	0.0
		c) Too many tablets	0	0.0
		d) Stigma	0	0.0
		e) Far distance	0	0.0
		f) Treatment is costly	0	0.0
		g) Lack of family support	0	0.0
		h) No food	0	0.0
		i) Any other	0	0.0
		a + c	37	37.0
		a + e	2	2.0

D: Socioeconomic related factors

Table 3D: Table showing the frequency and percentage wise distribution on factors contributing to noncompliance to tuberculosis treatment among tuberculosis patient

n = 100

Sr. No	Questions		Frequency (*n*)	Percentage (%)
1.	Do you have financial burden because of Anti tuberculosis drugs treatment?	Yes	78	78.0
		No	22	22.0
2.	Did your job and salary affected after starting Anti tuberculosis drugs?	Yes	82	82.0
		No	18	18.0
3.	Have you stopped your treatment due to financial burden?	Yes	79	79.0
		No	21	21.0
4.	During the time of Anti tuberculosis treatment, is there adequate food intake?	Always	7	7.0
		Some time	86	86.0
		Never	7	7.0
5.	Do you have a treatment supporter?	Yes	90	90.0
		No	10	10.0
6.	If yes, from where you get support?	Family members	90	100.0
		Relatives	0	0.0
		Government	0	0.0
		NGO (Non-governmental organization)	0	0.0
		Other	0	0.0

Assessment of Factors Contributing to Noncompliance with Tuberculosis
Treatment among Tuberculosis Patients in Selected Areas

29

Section IV: Descriptionon association of the factors contributing to noncompliance to tuberculosis treatment with selected demographic variable shows that

1) There is significant association of family income with patient related factors & health care system related factor.

2) There is significant association of education with patient related factor and socioeconomic related factor.

3) There is significant association of occupation with patient related factor and socioeconomic related factors.

4) There is significant association of place of residence with patient related factor, health care system related factor and disease and medicine related factor.

Discussion

The findings of the study was discussed with reference to the objectives stated and with the findings of the other studies in this section

Mohammed El-Muttalut and Mustafa Khidir Elnimeiri conducted a study to assess the factors contributing to non-compliance with treatment among tuberculosis patients-Kassala State-Sudan (2016). A cross-sectional study was conducted in Kassala State. The sample size mounted to 366 participants who were selected using simple random sampling technique. A standardized administered pre-tested, pre-coded questionnaire was used to collect the data. The questionnaire consisted of 10 sections with a total of 80 questions. A multivariate logistic regression analysis model was built using the enter method for the statistically significant variables at univariate analysis level taking *p*-value of 0.25 to determine the association between non-compliance and the study outcomes. 366 TB patients were included in this study, of whom 60 were treatment defaulters. TB patients aged 40 years and above, and those living in rural areas were found to be at higher risk of default with *p*-value 0.023 and 0.013 respectively. Lower education level and low income were also found to be significantly associated with treatment default with *p*-value 0.024 and 0.045 respectively. The study revealed that discontinuing treatment after feeling better (and wrongly perceiving it as cure) at the start of continuation phase was the most important predictor of treatment default with *p*-value 0.004. Non-compliance was found to be influenced by multiple factors including lack of patient knowledge and awareness about TB and its treatment (stopping treatment after feeling better), low education level, low income level and age and residence of the patient.[8]

Conclusion

Non-compliance was found to be influenced by multiple factors including experiencing side effects of Antituberculosis treatment and did not feel better throughout the Antituberculosis treatment and job and salary affected.

Implications of the Study

The findings of this study have implicated in nursing education, community and medicine practice and research.

Nursing Practice

In nursing clinical practice this research will help to find out other factors contributing to noncompliance tuberculosis treatment.

- This will help to find out the knowledge of participants and prevention of disease.

- This can help to find out the attitude of health care workers.

- This study can be used as an informative illustration for community health nurses working in community for caring for those clients receiving antituberculosis treatment.

- This will help to improve awareness of importance of continuation of tuberculosis treatment

Nursing Education

Nursing education promote clinical and classroom learning among nursing students. The results of the study can be used by nursing teachers as an informative illustration for nursing students while teaching the factors contributing to noncompliance tuberculosis treatment to tuberculosis patients.

Nursing Research

- Clinical research, based on biological, behavioral, and other types of investigation, provide scientific basis for the care of individual across the lifespan and occurs in any setting where nursing care is provided.

- The tool, technique and review of literature can provide an avenue for further research

studies. It certainly increases the body of knowledge and can be used as reference material for the future.

Nursing Administration

- Nursing administration to improve the nursing care provided by health care personnel, the nurse administrator can use the finding of this study as a basis for in-service education for the trained nurses.

- The nurse administrator should communicate this knowledge to the community area and reduces the factors contributing to noncompliance tuberculosis treatment.

Limitation

The study limited to:

- The study was limited to only non-compliance tuberculosis patients.

- The study was only limited to assessing the factors contributing to noncompliance, hence no intervention was implemented.

Recommendation

- A similar study can be replicated on a larger population for a generalization of findings.

- A similar study can be done using different research methodology.

- A similar study can be done to identify factors contributing to non-compliance to Tuberculosis treatment amongst pulmonary tuberculosis patients.

- A similar study can be done to assess the Quality life after Pulmonary Tuberculosis.

- A comparative study can be done between noncompliance and quality of life of Tuberculosis patient.

References

1. Black Joyce M, Hawks Jane Hokanson. Management of Client With Parenchymal And Pleural Disorders. In: Medical Surgical Nursing. 8th ed. Elesvier p.1064

2. Lewis SL, Heitemper MM. Nursing Management: Lower Respiratory Problems. In: Medical Surgical Nursing. 1st ed. Elsevier p.569.

3. Tuberculosis in India. U.S. Agency for International Development. Available from: URL https://www.usaid.gov/what-we-do/global-health/tuberculosis/technical-areas/tuberculosis-india (8/10/2018 at 11pm)

4. Smeltzer SC, Bare BG, Hinkle JL, et al. Medical Surgical Nursing. In: Medical Surgical Nursing. 12th ed. Wolters Kluwer p.567.

5. Black JM, Hawks JH. Medical Surgical Nursing. In: Medical Surgical Nursing. 8th ed. Elsevier; p.1604.

6. Bamber BA, Masters BA, Hoyle GW, et al. Proceedings of the National Academy of Sciences of the United States of America. U.S. National Library of Medicine; 1994. Availablefrom: URL https://www.ncbi.nlm.nih.gov/pmc/articles/PMC44499 (18/3/2018 at 11pm)

7. Health Communication. Health Belief Model. Universiteit Twente. University of Twente; Available from: URL https://www.utwente.nl/en/bms/communication-theories/sorted-by-cluster/Health Communication/Health_Belief_Model/ (9/11/2018 at 2.30pm)

8. El-Muttalut M, Khidir Elnimeiri M. Factors contributing to non-compliance with treatment among tuberculosis patients-Kassala State-Sudan-2016. International Scholars Journals. 2017Mar;6(2326-7291):332–8.