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Research Article

Descriptive Study to Assess the Awareness of Tuberculosis and Adherence to DOTS Therapy Among the Tuberculosis Patients In A Selected Community, New Delhi

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A B S T R A C T

Tuberculosis is an infectious bacterial disease caused by mycobacterium tuberculosis. According to, the WHO, in 2022, an estimated 10.6 million people fell ill with tuberculosis (TB) worldwide. Tuberculosis is a preventable and treatable disease. Proper DOTS therapy has an important role in the treatment of tuberculosis. The main purpose of this study was to assess the awareness of tuberculosis and adherence to DOTS therapy among the tuberculosis patients in a selected community, New Delhi.

A quantitative approach with a non-experimental descriptive research design was used for this study. A structured questionnaire was used for data collection among tuberculosis patients who were 18 Years and above from a selected community, New Delhi. The sample size was 140 tuberculosis patients, and the sampling technique used was a non-probability purposive sampling technique.

The findings of this study showed that the majority of subjects (52.85%) were partially aware, (22.85%) were fully aware and (24.28%) were not at all aware about the disease. The study also elucidates that the majority of the patients, i.e., (68.57%), were non-adherent to DOTS therapy; (25%) showed partial adherence; and only (6.42%) showed complete adherence, respectively.

Though the population are partially aware of the disease tuberculosis, their adherence to DOTS therapy is not satisfactory. It was also observed that misconceptions regarding the disease still exist amongst the study population. There is a need to provide essential knowledge about tuberculosis to the general population, and stress should be laid upon making the population adherent to DOTS therapy to increase the effective outcome of the therapy.

Keywords: DOTS Therapy, Adherence, Awareness

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Introduction

Tuberculosis is one of the most infectious and deadly diseases and remains a leading cause of morbidity and mortality worldwide. Mycobacterium tuberculosis is the causative organism of tuberculosis. It primarily affects the lungs, a condition known as pulmonary tuberculosis. From the lungs, the infection can spread to other organs of the body such as the brain, kidneys, abdomen, and bones; this is referred to as extrapulmonary tuberculosis. Despite being a preventable and treatable disease, tuberculosis continues to have a significant global public health impact. According to the World Health Organization (WHO), millions of new cases and deaths due to tuberculosis are reported each year, with a high burden in developing countries. Tuberculosis is strongly associated with poverty, low socioeconomic status, and overcrowded or polluted living conditions. The majority of new cases and deaths occur in the Asian region. The incidence of tuberculosis is also higher among individuals infected with HIV.[1]

In 1993, the WHO declared tuberculosis a global emergency. To address this, WHO established the Directly Observed Treatment, Short-Course (DOTS) strategy and implemented it globally. DOTS therapy includes five key components: sustained political commitment, case detection through quality-assured bacteriology, standardised short-course chemotherapy under direct observation, an effective drug supply system, and standardised recording and reporting mechanisms.[2]

Awareness and knowledge regarding tuberculosis play a crucial role in early diagnosis, treatment adherence, and prevention of disease transmission. Lack of or inadequate awareness often leads to delayed health-seeking behaviour, stigma, treatment interruption, and the emergence of drug-resistant strains. Community education about the transmission and symptoms of tuberculosis—such as persistent cough, fever, night sweats, and weight loss—is essential for early case detection and improved treatment outcomes. Although DOTS has significantly improved treatment outcomes worldwide, patient adherence remains influenced by multiple factors, including knowledge about the disease, socioeconomic conditions, stigma, accessibility of treatment centres, and support from healthcare providers and family members.

Several studies have shown that misconceptions about tuberculosis, fear of social isolation, financial constraints, and lack of counselling contribute to poor adherence to DOTS therapy. Therefore, assessing the level of awareness among TB patients and examining their adherence to DOTS therapy is essential to identify gaps in education, counselling, and service delivery. Understanding these factors can help healthcare providers and policymakers design targeted interventions to improve treatment compliance, reduce disease transmission, and strengthen tuberculosis control programmes. Lack of awareness leading to non-adherence can result in multidrug-resistant tuberculosis (MDR-TB). Globally, an estimated 450,000 incident cases of MDR/RR-TB were reported in 2021. Non-adherence to therapy increases healthcare challenges and adds to the burden on the system.[3]

The present study aims to assess the level of awareness regarding tuberculosis and adherence to DOTS therapy among tuberculosis patients.

Methodology

A quantitative research approach with a descriptive research design was adopted for the present study. The study population comprised tuberculosis patients undergoing DOTS therapy. A total of 140 participants were selected using a purposive sampling technique. The sample size was determined arbitrarily, as the study was descriptive in nature and did not involve hypothesis testing. The study was conducted at selected centres in New Delhi, including the Community Health Centre (PSMS Kalkaji and Mehrauli Centre and MCD Tughlakabad). Data were collected using a structured interview schedule consisting of four sections. Section I included 15 items related to demographic characteristics. Section II comprised 5 items assessing the clinical profile of tuberculosis. Section III included 20 items to evaluate awareness regarding tuberculosis. Section IV consisted of 10 items assessing adherence to DOTS therapy.

The research instrument was validated by a panel of 10 experts, including three medical specialists and seven nursing educators. Based on their expertise and feedback, all items were deemed appropriate for the study. Prior to data collection, formal written administrative permission was obtained from the respective authorities of PSMS Kalkaji, Mehrauli Centre, and MCD Tughlakabad. Informed consent was obtained from all participants, and they were informed of their right to withdraw from the study at any time. Confidentiality and anonymity of the participants were strictly maintained. Data collection was carried out in July 2023 among tuberculosis patients attending selected DOTS centres in New Delhi, using the structured questionnaire. The collected data were analysed using descriptive statistical methods.

Result

Section 1: Demographic Data

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Table 1.Frequency and percentage distribution of demographic data of tuberculosis patients

n=140

S. no.	Demographic Data	Frequency(F)	Percentage (%)
1.	Age • 18-25 years • 26-35 years • 36-45 years • 46 years and above	 71 34 20 15	 50.71% 24.28% 14.28% 10.71%
2.	Gender • Male • Female • Transgender	 77 62 1	 55% 44.28% 0.71%
3.	Religion • Hindu • Islam • Christian • Others	 98 37 4 1	 70% 26.42% 2.85% 0.71%
4.	Educational Status • Illiterate • Primary • Secondary • Senior secondary • Diploma/Graduate • Post graduate and above	 19 21 43 22 29 6	 13.57% 15% 30.71% 15.71% 20.71% 4.28%
5.	Occupation • Unemployed • Housewife • Student • Business • Government job • Private job • others	 21 18 42 8 4 24 23	 15% 12.85% 30% 5.71% 2.85% 17.14% 16.42%
6.	Family Income • Below Rs 20000 • Rs 20001-30000 • Rs 30001-40000 • Above Rs 40000	 70 45 14 11	 50% 32.14% 10% 7.85%
7.	Type Of Family • Joint family • Nuclear family • Extended family	 66 71 3	 47.14% 50.71% 2.14%

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8.	No. Of Rooms • 1 • 2 • 2 • More than 3	30 58 34 18	21.42% 41.42% 24.28% 12.85%
9.	Living In Separate Room • Yes • No	75 65	53.57% 46.42%
10.	Properly Ventilated Room • Yes • No	65 75	46.42% 53.57%
11.	House Having Proper Sunlight • Yes • No	54 86	38.57% 61.42%
12.	Regularly Keep Clothes And Belongings In Sunlight • Yes • NO	63 77	45% 55%
13.	Family Member Suffered From Tuberculosis In Past • Yes • No	64 76	45.71% 54.28%
14.	family member suffering from tuberculosis in present • Yes • No	87 53	62.14% 37.85%
15.	Attended Any Tuberculosis Awareness Programme • Yes • No	49 91	35% 65%

The data presented in Table No. 1 shows that the maximum of the sample subjects, i.e., 50.71% (71), were in the age group of 18 –25 years; 24.28% (34) were in the age group of 26 - 35 years; 14.28% (20) were in the age group of 36- 45 years; and 10.71% (15) were in the age group of 46 years and above. The majority of sample subjects i.e., 55% (77), were males 44.28% (62) were female, and 0.71% (1) were transgender. The majority of sample subjects were 70% (98) Hindu, 26.42% (37) Muslim, 2.85% (4) Christian and 0.71% (1) others. The majority of sample subjects, 30.71% (43), have studied up to secondary school; 20.71% (29) are graduates; 15.71% (22) have studied up to senior secondary; 15% (21) studied up to primary school; 13.57% (19) were illiterate; and 4.28% (6) are postgraduate and above.

The majority of the sample subjects i.e., 30% (42), were students; 17.14% (24) were in private job;16.42% (23) were others; 15% (21) were unemployed; 12.85% (18) were housewife; 5.71% (8) were in business; and 2.85% (4) were in government jobs. Majority of sample subjects i.e. 50% (70) have income below Rs 20000, 32.14% (45) have income between Rs 20001-30000, 10% (14) have income between Rs 30001-40000, 7.85% (11) have income above Rs 40000.

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Majority of sample subjects i.e. 50.71% (71) belongs to nuclear family, 47.14% (66) belongs to joint family and 2.14% (3) belongs to extended family. The majority of sample subjects i.e., 41.42% (58), have 2 rooms; 24.28% (34) have 3 rooms; 21.42% (30) have 1 room; and 12.85% (18) have more than 3 rooms. The majority of sample subjects i.e., 53.57% (75), are living in separate rooms, and 46.42% (65) are not living in separate rooms. The majority of sample subjects, i.e., 53.57 % (75), are not living in a properly ventilated room, and 46.42% (65) are living in a ventilated room.

The majority of sample subjects i.e., 61.42 % (86), are not living in a house having proper sunlight, and 38.57% (54) are living in a house having proper sunlight. The majority of sample subjects, i.e., 55% (77), do not keep their clothes and belongings in the sunlight, and 45% (63) do keep their clothes and belongings in sunlight. The majority of sample subjects, i.e., 54.28% (76), do not have family members who suffered from tuberculosis in the past, and 45.71% (64) have family members who suffered from tuberculosis in the past. The majority of sample subjects, i.e., 62.14% (87), have family members suffering from tuberculosis currently and, 37.85% (53) do not have family members who suffer from tuberculosis at present. The majority of sample subjects, i.e., 65% (91), did not attend the tuberculosis awareness programme, and 35% (49) did attend the tuberculosis awareness programme.

Section II: Clinical Profile

Data shown in Table 2 represent that the majority of sample subjects, i.e., 60% (84), suffer from pulmonary tuberculosis, and 40% (60) suffer from extrapulmonary tuberculosis. The majority of sample subjects, i.e., 75% (105), are new cases; 19.28% (27) are recurrent cases; 4.28% (6) need treatment after being lost to follow-up; 1.42% (2) need treatment after failure; and there are no cases of MDR and XDR. The majority of sample subjects, i.e., 37.14% (52), were diagnosed 3 months ago, 36.42% (51) were diagnosed 1 month ago; 22.14% (31) were diagnosed 6 months ago; and 4.28% (6) were diagnosed 1 year ago. The majority of sample subjects, i.e., 64.28 % (90), are in the intensive phase, and 35.71% (50) are in the continuation phase. The majority of sample subjects, i.e., 40.28% (57) have been taking treatment for the last 3 months; 29.28% have been taking treatment for less than 1 month; 25.71% (36) have been taking treatment for the last 6 months; and 4.28% (6) have been taking treatment for the last 1 year.

Section III: Analysis of Awareness Of Tuberculosis

Table 2.Frequency and percentage distribution of clinical profile of tuberculosis patients

n=140

S.NO.	Clinical Profile	Frequency(F)	Percentage (%)
1.	SITE OF DISEASE • Pulmonary tuberculosis • Extrapulmonary tuberculosis	 84 56	 60% 40%
2.	TYPE OF PATIENT • New case • Recurrent case • Treatment after lost to follow up • Treatment after failure • MDR case • XDR case	 105 27 6 2 0 0	 75% 19.28% 4.28% 1.42% 0% 0%
3.	TIME OF DIAGNOSIS • 1 month ago • 3 months ago • 6 months ago • 1 year ago	 51 52 31 6	 36.42% 37.14% 22.14% 4.28%
4.	PHASE OF TREATMENT • Intensive phase • Continuation phase	 90 50	 64.28% 35.71%
5.	DURATION OF TREATMENT • Less than 1 month • From last 3 months • From last 6 months • From last 1 year	 41 57 36 6	 29.28% 40.28% 25.71% 4.28%

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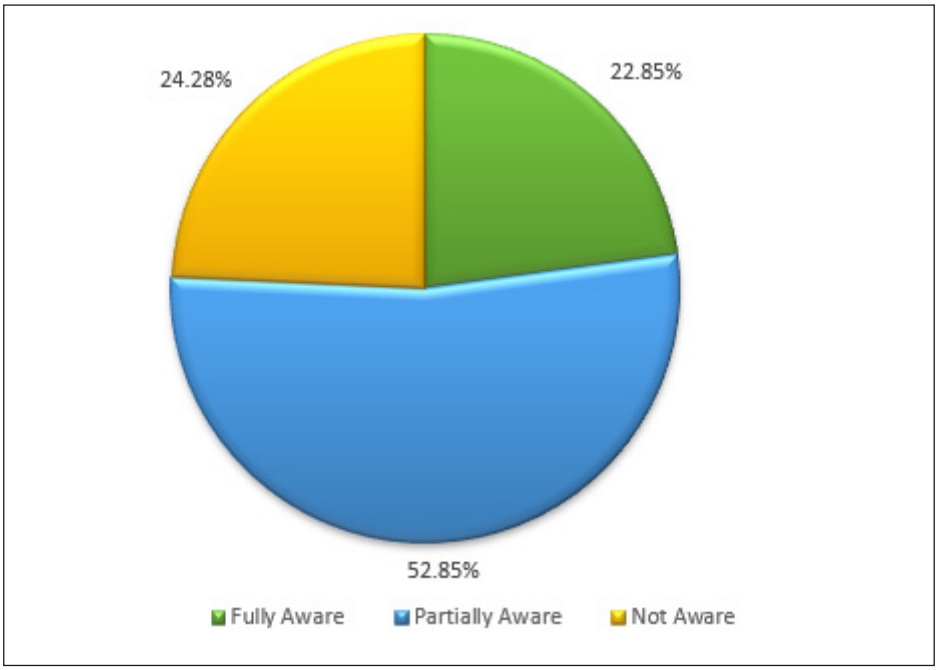


Figure 1.Pie diagram showing percentage distribution of awareness of tuberculosis patients regarding tuberculosis disease

Figure no.1: Figure no. 1 depicts the percentage distribution of awareness of tuberculosis patients regarding tuberculosis disease. The majority of the subjects, i.e., 52.85%, were partially aware; 24.28% were not aware, and only 22.85% were fully aware.

Section IV: Adherence To Dots Therapy Among Tuberculosis Patients

The findings indicate that the majority of the sample subjects, 82.85% (116), received medication in fixed-dose combination (FDC) form, while 17.14% (24) received a combi pack. Most participants, 66.42% (93), reported that they do not forget to take their medications, whereas 33.57% (47) admitted that they sometimes forget. In the past two weeks, 70% (98) of the participants reported taking their medications regularly, while 30% (42) did not.

A majority of the participants, 75% (105), reported that they did not stop taking their medications. However, 25% (35) discontinued their medications without consulting their doctor due to experiencing discomfort or worsening symptoms. Regarding medication adherence during travel, 70.71% (99) reported that they do not forget to carry or take their medications while travelling, whereas 29.28% (41) reported that they do forget.

Furthermore, 86.42% (121) of the participants reported taking their medication on the previous day, while 13.57% (19) did not. It was also observed that 68.57% (96) of the participants stopped taking medications when their condition appeared to be under control, whereas 30.71% (43) continued their medication as prescribed.

In terms of convenience, 73.57% (103) of the participants reported no inconvenience in taking medications, while 26.42% (37) experienced inconvenience. Additionally, 60% (84) of the participants did not follow special instructions related to medication intake, whereas 40% (56) adhered to such instructions. Finally, 66.42% (93) of the participants reported difficulty in taking medications, while 33.57% (47) reported no difficulty.

Figure no. 2 depicts the percentage distribution of samples related to adherence to DOTS therapy. Majority of sample i.e. 68.57% did not adhere to DOTS therapy, 25% were partially adhered to DOTS therapy and only 6.42% adhered to DOTS therapy.

Table 3.Mean, median, mode and standard deviation of awareness scores of the tuberculosis patients regarding tuberculosis disease

n=140

Variable	Possible Range Of Score	Obtained Range Of Score	Mean	Median	Mode	Standard Deviation
Awareness Score	0-20	4-20	12.82	12.5	11	3.18

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Table 4.Frequency and percentage distribution of adherence to DOTS therapy of the tuberculosis patients

n=140

S.NO.	Variables	Frequency(F)	Percentage (%)
1.	In which form you take the dosage of medication? • FDC • Combi pack	 116 24	 82.85% 17.14%
2.	Do you sometimes forget to take your tuberculosis pills? • Yes • No	 47 93	 33.57% 66.42%
3.	Over the past 2 week, were there any days when you did not take your tuberculosis medicine? • Yes • No	 42 98	 30% 70%
4.	Have you ever cut back or stopped taking medications without telling your doctor because you felt worse when you took it? • Yes • No	 35 105	 25% 75%
5.	When you travel or leave home, do you sometimes forget to bring along your medications? • Yes • No	 41 99	 29.28% 70.71%
6.	Did you take your tuberculosis Medicine yesterday • Yes • No	 121 19	 86.42% 13.57%
7.	When you feel your condition is under control, do you sometimes stop taking your medicine? • Yes • No	 43 96	 31.71% 68.57%
8.	Taking medication is a real inconvenience for some people. Do you ever feel hassled about sticking to tuberculosis treatment plan? • Yes • No	 37 103	 26.42% 73.57%
9.	Do you follow any special instruction along with your medications? • Yes • No	 56 84	 40% 60%
10.	Are you having any problem in taking the medications? • Yes • No	 93 47	 66.42% 33.57%

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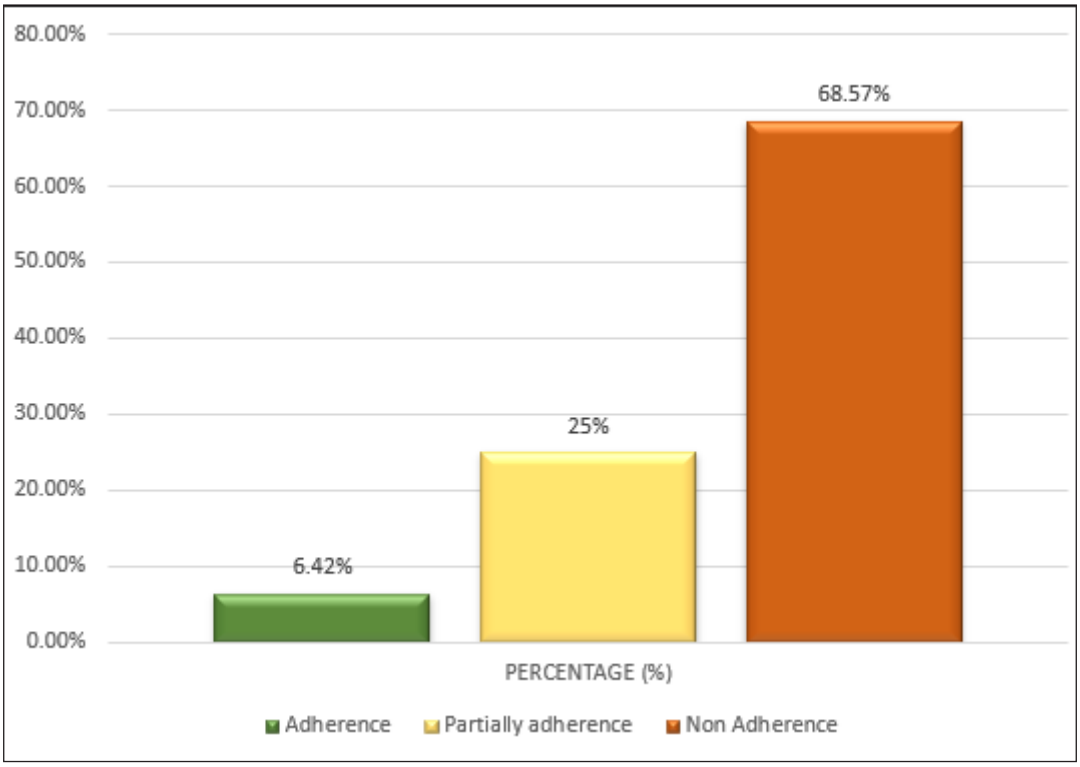


Figure 2.Bar diagram showing percentage distribution of samples related to adherence, partially adherence and non-adherence to DOTS therapy

Discussion

Tuberculosis (TB), despite being a preventable and curable disease, continues to be a major public health problem worldwide. Limited awareness and poor adherence to treatment significantly contribute to its ongoing transmission and disease burden. Therefore, improving knowledge about TB and strengthening treatment compliance are essential to reduce its impact and enhance patient outcomes.

Directly Observed Treatment, Short-course (DOTS) therapy is an effective intervention when properly followed by patients. The present study aimed to assess the level of awareness regarding tuberculosis and adherence to DOTS therapy among TB patients in a selected community. The findings revealed that a majority of the participants (52.85%) were partially aware of the disease. However, a significant proportion (68.57%) of the subjects were non-adherent to DOTS therapy.

The findings of the present study are consistent with those reported by Bagchi S., Ambe G., and Sathia Kumar N. (2010) in Mumbai, India, who investigated determinants of poor adherence to anti-tuberculosis therapy among pulmonary TB patients. Their study showed that approximately one-fifth of the patients were non-adherent, and the factors influencing non-adherence varied between newly diagnosed patients and other groups.[4]

Similarly, a case-control study conducted by Tachfouti N., Salam K., Berraho M., and Nejjari C. (2012) in a Moroccan region examined the impact of knowledge and attitudes toward TB on treatment adherence. The study found that poor knowledge about TB was more prevalent among non-adherent patients (72.9%). Additionally, one of the main reasons for treatment default was the patients' perception that they had been cured.[5]

The findings of the present study are consistent with the results of a descriptive study conducted by Mexina SJ., Kaur S., and Kumari A., to assessed knowledge, attitude, and adherence to anti-tuberculosis treatment among patients attending DOTS centres at selected PHCs. The study reported that only 29% of the participants had good knowledge, 32% demonstrated a positive attitude, and merely 25% showed good adherence to DOTS therapy. These findings indicate that a considerable proportion of tuberculosis patients have inadequate knowledge and suboptimal adherence levels.[6]

Limitations

The study was limited to tuberculosis patients registered under the DOTS programme in selected community settings; therefore, the findings cannot be generalised to all TB patients, especially those not enrolled in DOTS or receiving treatment from private healthcare facilities.

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Only patients who were currently on treatment were included in the study.

The study relied on self-reported data to assess awareness and adherence, which may be subject to recall bias and social desirability bias, potentially affecting the accuracy of responses.

Conclusion

The study concludes that although the population was partially aware about tuberculosis adherence to DOTS therapy remains inadequate, with persistent misconceptions influencing treatment behaviour. There is a need to strengthen health education and awareness programmes to address these gaps effectively. Patient counselling, regular follow-up, and involvement of family members can help to improve treatment adherence. Additionally, supportive measures such as incentives and improved healthcare services should be implemented to enhance treatment outcomes.

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