

---

**ORIGINAL ARTICLE****KNOWLEDGE ABOUT TUBERCULOSIS AMONG PATIENTS ATTENDING TUBERCULOSIS TREATMENT IN NORTHWESTERN ETHIOPIA**

<sup>1</sup> Alemayehu Mekonnen, MD, MSc.

**ABSTRACT:**

**BACKGROUND:** Adherence to therapy in patients with tuberculosis is a major determinant of their outcomes. Unfortunately, there is no currently known single predictor of adherence, given that this phenomenon represents a complex task specific behavior. Key factors influencing the efficacy of tuberculosis control program need to be identified. The objective of this study is to assess the level of patients' knowledge on the cause, mode of transmission and preventive methods of tuberculosis and to determine the socio-demographic profiles of patients that influence their knowledge.

**METHODS:** This cross sectional study was conducted, among 314 tuberculosis patients in five health institutions in North Gondar Zone. Respondents were selected using systematic sampling technique. Data were collected using a pre-tested questionnaire.

**RESULTS:** Based on the criteria set for knowledge, only 14.7% of patients had overall correct knowledge. There was misconception about the cause, mode of transmission and prevention and only 15% knew the cause of tuberculosis. Regarding mode of transmission 74% knew at least one, 95% had no doubt on curability of TB, 43% knew the duration of treatment and only 34% knew about the side effects of drugs. Their knowledge was found to be influenced by the level of education, area of residence, and having a health teaching at health institutions.

**CONCLUSION:** The overall correct knowledge of tuberculosis patients is surprisingly low. Efforts to strengthen health education in tuberculosis clinics should be fostered.

**KEY WORDS:** Tuberculosis, tuberculosis control, Northwest Ethiopia

**INTRODUCTION:**

The burden of tuberculosis (TB) is death due to a single infectious agent immense and it is responsible for nearly 8 among young adults. In developing

million cases and an estimated 2 million deaths annually. It is the leading cause of

---

<sup>1</sup> Author of correspondence Dr. Alemayehu Mekonnen, P.O.Box 32248, Addis Ababa, Ethiopia  
[Alemayehum19@yahoo.com](mailto:Alemayehum19@yahoo.com)

countries it is responsible for 25% of avoidable deaths (1, 2).

World wide there are 22 countries identified as "high burden countries" which bear 80% of the global incidence cases of TB. Ethiopia ranks seventh in this list; given the large population size, high incidence of TB and concomitant HIV epidemic and over all high level of poverty (3, 4).

To curb the problem of TB the world health assembly has declared Directly Observed Treatment Short-course for Tuberculosis (DOTS) as effective strategy in the control of TB. In Ethiopia this programme has been started as pilot in few areas of the country in 1992 and with gradual expansion to all regions and Zones in 2002 (4).

Adherence to treatment among patients with TB is a major determinant of their outcome (5). One of the factors that are identified in affecting adherence is knowledge of patients about their disease. A study done in Malaysia has shown that poor compliance was found among patients who equated disappearance of symptoms of TB with cure (6). High rate of default of 50% was reported in Addis Ababa and the major predictor was inadequate knowledge of patients (7). Similarly knowledge about the duration of treatment was found to determine compliance among TB patients in Malawi (8). A study conducted among community members in North Ethiopia indicates that Knowledge of Tuberculosis was low and females, illiterates and rural residents had low knowledge score (9). Thus this study is conducted to determine the Knowledge of TB patients about TB and describe factors affecting TB patients' knowledge about their disease.

#### MATERIALS AND METHODS:

This study was conducted in north Gondar zone which has two hospitals, thirteen

health centres, 60 health stations and 17 health posts. DOTS program has been on implementation in North Gondar since the 2000. There are 2 hospitals and 8 health center providing the service during the study period. A cross sectional study was conducted among TB patients in health institutions from five districts of N.Gondar zone, Northwestern Ethiopia during the period April- June 2002.

One hospital and five health centres were selected using simple random sampling from the total list of health institutions. The size was determined taking the conservative estimate of 50% proportion patients for knowledge of TB, a confidence level of 95%, margin of error tolerated of 5% among the registered 1960 TB patients. A sample size of 322 patients, age 12 years and above, who were following either the daily treatment or on a monthly follow up visit were selected. Systematic sampling method was used and every second patient coming for daily or follow up visit was included. Data were collected using a standardized and pre-tested questionnaire by four 12<sup>th</sup> grade completed trained interviewers. Data collection process was supervised by a physician. Information about the socio-demographic and economic profile, disease status and general knowledge about TB were inquired.

Based on this study, a patient was considered as having overall correct knowledge for TB if he/she knows the cause of TB as bacteria or micro-organisms, and mention important modes of transmission, and no doubt on curability of illness and know duration of treatment stated as 6-8 months by the National Tuberculosis and Leprosy control manual (4).

The collected data were entered in to computer and analyzed using EPI version 6.04d. Percentage proportions and odds ratio with 95% CI were used. Two tailed  $\chi^2$

test was used to test for statistical significance.

The study got ethical clearance from North Gondar Zonal health department and from each health care facility. A verbal informed consent was taken from each patient before collecting data. For subjects under the age of 18 years consent was taken from the parents / guardians. At the end of the interview a brief health education was given on the causes, modes of transmission, duration of treatment and the importance of tuberculosis contact/family members' examination.

## RESULTS:

Data were collected from 314 patients with a response rate of 97.5 %. The mean age of interviewed subjects was  $29.6 \pm 12.6$  years, with the male to female ratio of 1.2:1. One hundred and eighty four (59.0%) were from rural villages while the rest were urban dwellers. As to their marital status, 154/314 (49.0%) were married, 58/314 (18.5%) single. More than half (53.4%) of cases were illiterate or had no education at all;

farmers were the most common occupational group in 29.4% followed by housewives in 25.7%. The mean monthly family income was 246 Birr  $\pm$  389.4 Birr; half of whom had an income of 150 Birr or less (Table 1).

More than 95% knew at least one symptom and 64% of them mention more than one. The main symptoms reported were fever, night sweating and cough in 82.5%, 78.6% and 76.4% respectively. But other non-specific symptoms, which are not related to TB like gastro intestinal upsets, were also mentioned. The cause of TB was believed to be cold weather by most respondents (57.6%). Only 15.9% replied as it is due to micro-organism and 26.4% of patients had no idea about it. As depicted in table 2 other perceived causes like heavy workload, hereditary (familial) and superstitutions causes were also mentioned. Of one third of patients who knew about the side effect of the anti-TB drugs, the main known side effects were reddish discoloration of urine 98 (31.2%) and skin rash 49 (15.6%) (Table 2).

**Table 1.** The socio-demographic profile of 314 interviewed tuberculosis patients in north western Ethiopia, June 2002.

Variables	Frequency (n=314)	Percent
Age		
< 15	24	7.6
15-24	85	27.1
25-34	110	35.0
35-44	59	18.8
45-54	24	7.6
+55	12	3.8
Sex		
Male	186	59.2
Female	128	40.8
Residence		
Urban	128	41.0
Rural	186	59.0
Marital status		
Married	154	49.0
Single	58	18.5
Divorced	45	14.3
Widowed	13	4.1
Under age	44	14.0
Educational status		
Illiterate	164	52.2
Literate	150	47.8
Family income		
< 150 birr	145	46.2
151 - 350	85	27.1
351 - 500	22	7.0
501 - 1000	11	3.5
> 1000	8	2.5
No regular income	43	13.7
Occupation		
Farmers	89	28.3
House wives	78	24.8
Daily labourers	33	10.5
Students	21	6.7
Government employees	12	3.8
Merchants	11	3.5
Unemployed	16	5.1
Others*	54	17.2

**Table 2.** Knowledge on the symptom, cause, transmission, control and prevention of tuberculosis among tuberculosis patients in north western Ethiopia June 2002.

Variables	Frequency	Percent
<b>Symptom of Tuberculosis</b>		
Fever	259	82.4
Night sweating	247	78.6
Cough of $\geq 3$ weeks	240	76.4
Weight loss	241	76.7
Chest pain	219	69.7
Anorexia	240	76.4
Body weakness	231	73.6
Blood in the sputum	116	36.9
Others*	63	20.5
<b>Perceived cause of Tuberculosis</b>		
Cold	181	57.6
Micro-organism (bacteria)	50	15.9
"Mitch" §	30	9.6
Superstition (witchcraft)	16	5.1
Work load	11	3.5
Don't know	83	26.4
Others **	24	7.7
<b>Mode of transmission</b>		
Coughing and breathing	244	77.7
Shared drinking utensils	95	30.3
Drinking raw milk	52	16.6
Blood contact with TB patients	31	9.9
Contact with TB patient sputum	23	7.3
Shared utensils and food	19	6.1
Others ***	9	2.9
<b>Methods of prevention and control</b>		
Taking drugs properly with out interruption	239	76.1
Eating high protein diet	190	60.5
Keeping personal hygiene	167	53.2
Isolation of patients	123	39.2
Immunization	74	23.6
Don't know	33	10.5

~ Since more than one response are possible total percentages exceed 100 %.

\*Others include: - body swelling, nausea, vomiting, diarrhoea, vertigo, joint pain, insomnia, loss of scalp hair, chills.

§ "Mitch" is a non-specific condition described in the community as the cause for different acute febrile episodes.

\*\* Others include: under nutrition, hereditary (familial), sun exposure, dust, sweating, drinking alcohol and working around fire and anger.

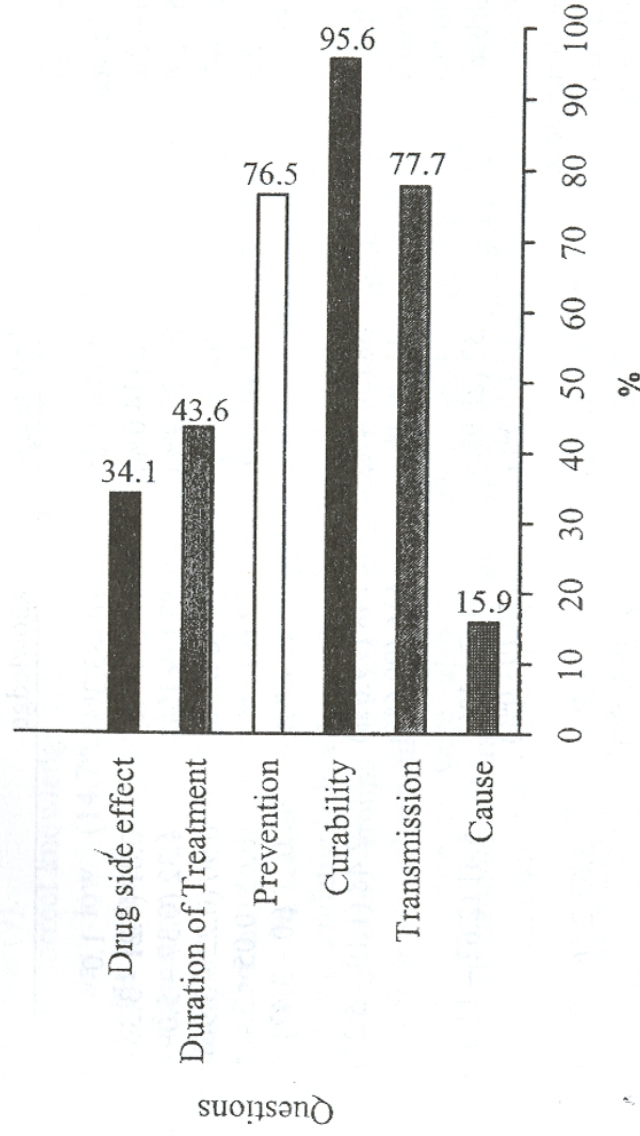
\*\*\* Others include: - shared food, sexually, sharing cloths.

Among the study subjects only 226 (71.9%) knew specifically about their diagnosis. Of the 88 patients who had no idea about their diagnosis 91% were in the age below 45 years, 56.8% were males, 59% live in a rural area, 60.2% had no education at all. The communicability of TB is acknowledged in 82.8% of the interviewed TB patients. Coughing and breathing were the main mode of transmission stated in 244 (77.7%), followed by sharing drinking utensils in 95 (30.3%), raw milk consumption in 52 (16.6%) but few patients also mentioned TB being transmitted sexually. The vast majority of tuberculosis patients 300 (95.6%) had no doubt about the curability of TB, among which 179 (59.9%) believe that they have adequate knowledge about the treatment of tuberculosis. But only 137 (43.6%) patients knew the actual treatment duration recommendation by the National Tuberculosis and Leprosy Control programme, which is 6-8 months for the short course treatment. When asked on the preventive and control methods for TB, 89.5% mentioned at least one method of prevention. Two hundred thirty nine (76.1%) reported that they have taken

drugs properly without interruption, 190 (60.5%), took special diet but still a proportion of patients 123 (39.2%) considered isolation of TB patients as the main stay of prevention. Out of the 281 patients who acknowledge the impact of treatment interruption, 272 (96.7%) stated exacerbation of disease, 90 (32.0%) prolongation of duration of treatment and 113(40.2%) difficulty to be treated with the same drugs.

Patients who were attending the intensive phase of treatment daily and those who were hospitalized were asked about the reasons of their daily contact with the health worker or for hospitalization and 50.7% considered it for being observed while taking treatment, 28.5% to get daily injection, 18.7% to reduce disease transmission to their contacts at home, 13.4% since their residence is far to attend but 4.6% didn't know the reason but were coming since they were told (Table 2). When asked on health education delivery at the treatment care facility, 29.2% of all patients had responded to have never received any health education about TB in the clinic (Fig.1).

**Figure-1** The proportion of respondents with knowledge of tuberculosis in N.Gondar, Ethiopia.



Literate patients gave more correct answer than illiterate ones ( $p = 0.001$ ). More urban patients (48.0%) knew the exact duration of treatment than rural patients (37%) the difference was significant at ( $p = 0.04$ ). Male sex and urban residence were significantly associated with knowledge on problems associated with defaulting ( $P < 0.003$ ). Literate, males and those living in urban areas were associated with correct

knowledge on drug side effect ( $p < 0.05$ ). In general; only 47(14.9%) of patients were found to have overall correct knowledge about tuberculosis. Males, urban dwellers, literates, monthly family income  $\geq 200$  birr and regular health teaching were significantly associated with overall correct knowledge about tuberculosis ( $P < 0.002$ ) (Table-3)

**Table 3.** Factors related to having overall correct knowledge on Tuberculosis among 314 tuberculosis patients in North western Ethiopia, June 2002.

Variables	Having overall Correct knowledge	Don't have over all Correct knowledge	OR (95 % CI)	P-Value
Age				
< 15 years	4 (16.7%)	20 (83.3%)	1.0	
15 - 24	12 (14.0%)	74 (86.0%)	0.81 (0.21 - 3.36)*	0.73
25 - 34	23 (20.9%)	87 (79.1%)	1.32 (0.37 - 5.09)*	0.63
25 - 44	9 (15.3%)	50 (84.7%)	0.90 (0.22 - 3.96) *	0.87
45 - 55	2 (8.3%)	22 (91.7%)	0.45 (0.05 - 3.4)*	0.38
55+	0 (0%)	11 (100%)	0 (0 - 3.47) *	0.15
Sex				
Male	38 (20.4%)	148 (79.6%)		
Female	12 (9.4%)	116 (90.6%)	2.48 (1.19 - 5.27)	0.008
Residence				
Urban	37 (28.9%)	91 (71.1%)		
Rural	13 (7.0%)	173 (93.0%)	5.41 (2.62 - 11.34)	0.001
Educational level				
Literate	40 (26.7%)	110 (73.3%)		
Illiterate	10 (6.1%)	154 (93.9%)	5.6 ( 2.56 -12.53)	0.0001
Family income				
< 150 bjirr	15 (10.3%)	130 (89.7%)		
151 - 350	20 (23.5%)	65 (76.5%)	1.0	
> 350	12 (29.3%)	29 (70.7%)	2.67 (1.21 - 5.91)	0.007
Received Health teaching (Education)				
No	7 (7.5%)	86 (92.5%)		
Irregularly	13 (12.4%)	105 (87.6%)	1.52 (0.54 - 4.43)	0.390
Regularly	29 (28.2%)	74 (71.8%)	4.81 (1.87 - 12.8)	0.0002

• Fisher exact test used

revealed that only 9% and 40% respectively knew the primary cause of TB as germ (9, 10).

## DISCUSSION

This study indicated a knowledge gap about tuberculosis. Only 15.9% of patients knew the cause of TB correctly. Misconceptions on the cause including exposure to cold, hereditary or familial influences and witchcraft were mentioned. These may affect health seeking behavior and it will spread the social stigma among patients. Similarly a community based study done among community members and community health workers in Tigray

Just looking at one aspect of the assessment of knowledge of patients "knowledge on the duration of treatment" only 43% knew the exact duration. If patients are not well aware of the duration of treatment they may decide to stop treatment before they are cured or are free of disease.

The positive aspect found in this study is that patients' attitude on curability, transmission and prevention of TB. Almost all believe that TB is curable and moreover three-fourth of patients acknowledged TB is a transmissible disease and can be



prevented. This finding is higher compared to the result found among community members in Tigray where only 69.4 % acknowledge the curability of TB with modern medication and 67.9% believes that TB is transmissible (9).

The overall correct knowledge among TB patients was low (14.7%). This indicates that TB patients are not getting adequate information about different aspects of TB while they are on treatment. Studies conducted on OPD attendants in Malawi, TB patients in Tanzania and South Africa have shown a relatively low level of knowledge among these groups (11-13). Common misconception about the cause and transmission of disease were also observed among TB patients and traditional healers in Tanzania and non-TB patients in South Africa (11, 14). A study done in Ghana indicates misconception about the disease was related with high level of stigma, which consequently results in late diagnosis, high rate of default and death among TB patients (15).

The low level of knowledge in this study may be because of the fact that more than half of patients were illiterate, a third of all patients never got health education at the clinics. Other studies also revealed that knowledge about tuberculosis is related with educational status and health information delivered in tuberculosis clinic or by previous tuberculosis patients (6, 11, 12, 16-18).

The presence of overall correct knowledge towards TB was associated with male sex, living in urban areas, being literate in education status and being informed about TB at health institutions and higher level of income. This may be due to the fact that, urban residents have an exposure to public medias, have better access for health care, and are loosely attached with traditional beliefs of cause of disease than people in the rural areas. Male sex and higher level of income could be

related to better access for health care, which would lead for better information and knowledge about TB. A study conducted among community members in Tigray region revealed that, females, illiterates, and rural residents had lower level of Tuberculosis knowledge (9). Similarly, other studies have indicated that knowledge of tuberculosis was associated with higher educational status to the exclusion of other demographic and socio economic factors (12-13). A study conducted among Kansas City Metropolitan area high risk population indicates that sex, income and age were related with Tuberculosis knowledge (19).

This study shows that patients' understanding or knowledge of the disease is rather low which could be easily influenced by traditional beliefs and modern incorrect options. Therefore, health workers need to exploit the opportunity of the daily visit to explain the cause, transmission and treatment of TB.

Even though this study didn't investigate the influence of patients' knowledge on treatment outcome, lack of compliance usually occurs when patients do not understand fully the importance of prolonged and uninterrupted treatment. Particularly lack of compliance was observed when patients had poor knowledge on the duration of treatment and side-effect of drugs (12). Therefore, in this study low level of knowledge about TB and lack of organized and regular health education about the diseases in the clinics could result in defaulting from treatment.

Based on the findings health education; on the cause, transmission and methods of prevention and duration of treatment is recommended with emphasis to patients coming from rural areas and illiterates.

#### ACKNOWLEDGEMENTS

This study was financed by the Research and Publication Office of University of Gondar. The author would like to acknowledge Ato Tadesse Andarge, the Zonal Tuberculosis and Leprosy coordinator for his valuable assistance during data collection. I thank Dr. Yigzaw Kebde, Dr. Roshe, and Dr. Eyasu Mekonen for reviewing the manuscript. Finally the tuberculosis patients are acknowledged for taking part in the study.

#### REFERENCES:

1. Dye C, Ganett GP, Sleeman K, et al. Prospects of worldwide tuberculosis control under the WHO DOTS strategy. *Lancet*, 1998; 352: 1886-91.
2. Dye C, Scheele S, Dolin P, et al. Global burden of Tuberculosis: estimated incidence, prevalence and mortality by country. *JAMA*, 1999; 282:677-86.
3. WHO report. Global tuberculosis control: surveillance, planning, financing. Geneva, 2005.
4. MOH. Manual - National Tuberculosis and Leprosy Control Programme. Addis Ababa. 1997.
5. Lienhardt C, Mannch K, Bouchier V, et al. Factors determining the outcome of treatment of adult smear-positive tuberculosis cases in The Gambia. *Int J Tuberc Lung Dis*, 1998; 2(9):712-8.
6. Liam CK, Lim KH, Wong CM, et al. Attitude and knowledge of newly diagnosed tuberculosis

patients regarding the disease, and factors affecting treatment compliance. *Int J Tuberc Dis*, 1999 ;3(4):300-9.

7. Demissie M, Kebede D. Defaulting from tuberculosis treatment at the Addis Ababa Tuberculosis Center and factors associated with it. *Ethiop Med J*, 1994;32(2):97-106
8. Glynn JR. Measurement and determinants of tuberculosis outcome in Karonga District, Malawi. *Bull World health Organ*, 1998; 76(3):307-8.
9. M. Mesfin, T. Tasew, I G Tareke, et al. Community knowledge, attitude and practice on pulmonary tuberculosis and their choice of treatment supervisor in Tigray, northern Ethiopia. *Ethiop.J.Health.Dev*. 2005; 19: 21 - 27. ( special issue)
10. M. Mesfin, T. Tasew, I G Tareke, et al. Community health workers: their knowledge on pulmonary tuberculosis and willingness to be treatment supervisors in Tigray, northern Ethiopia. *Ethiopi.J.Health Dev* 2005; 19:28 - 34. ( special issue)
11. Banerjee A, Harries AD, Nyirenda T, et al. Local perception of tuberculosis in rural district in Malawi. *Int J Tuberc Lung Dis*. 2000; 4(11):1047-1051.
12. Wandwalo ER, Morkve O. Knowledge of disease and treatment among tuberculosis patients in Mwanza, Tanzania. *Int J tuberc Lung Dis*, 2000; 4(11):1041-1046.
13. Thomson EM, Myrdal S. Tuberculosis - the patients' perspective. *S Afr Med J* 1986; 70:263 - 264.

14. Metcalf CA, Bradshaw D, Stindt WW. Knowledge and beliefs about tuberculosis non – working women in Raversmead, Cape town. *S Afr Med J*. 1990; 77: 408 –411.
15. Lawn SD, Tuberculosis in Ghana: Social stigma and compliance with treatment (Correspondence). *Int J Tuberc Lung Dis*. 2000. 4(12):1190-1192.
16. Hoa, Diwan V. K., Thorson A. E. K. Knowledge about tuberculosis and its treatment among new pulmonary TB patients in the north and central regions of Vietnam k *Int J Tuberc Lung Dis* , 2004;8(5):603–608
17. Portero N., Rubio Y. M., Pasicatan M. A. Socio-economic determinants of knowledge and attitudes about tuberculosis among the general population of Metro Manila, Philippines. *Int J Tuberc Lung Dis*, 2002; 6(4):301–306
18. Gelaw M, Genebo T, Dejene, Lemma E, Eyob G. Attitude and social consequence of tuberculosis in Addis Ababa, Ethiopia. *East Afr Med J*. 2001; 78(7):382-8.
19. J. S. Marinac, S. K. Willsie, D. McBride, S. C. Hamburger. Knowledge of tuberculosis in high-risk populations: survey of inner city minorities. *Int J Tuberc Lung Dis*, 1998; 2(10):804–810