Original article

PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSION AND ANXIETY AMONG TB PATIENTS IN KASKI DISTRICT

Sapana Baral Parajuli[1], Rajesh Kumar Yadav[1,2], Sushila Baral[3]

[1.] LA GRANDEE International College, Pokhara, Nepal
[2.] Save The Children International, Kathmandu, Nepal
[3.] School of Health and Allied Sciences, Pokhara University

DOI: https://doi.org/10.3126/saarctb.v22i1.72465
Received: 22nd April Accepted:18th Nov Published: 31st Dec
This article is available at: https://www.saarctb.org/wp-content/uploads/2024/08/STAC_Journal_2023_VOL21_2024-AUGUST-2.pdf

ABSTRACT

Introduction: Tuberculosis (TB) is a serious public health issue in Nepal and globally. The burden of tuberculosis is further worsened by coexisting anxiety and depression. This study aims to assess the prevalence and factors associated with depression and anxiety symptoms among TB patients in Kaki District, Nepal.

Methodology: A community based cross sectional study was conducted among the TB patients residing in the Kaski district from March to September, 2023. Structured interview and validated questionnaires were used for data collection. Pretesting was done on 10% sample size in similar area to check the adaptability of the questionnaire. Data was entered in Epi-data (version 3.1) and exported to SPSS (version 20) for analysis. Binary logistic regression was used to observe the relationship between dependent and independent variables.

Results: A total of 239 TB patients were included in the study. The prevalence of depression and anxiety was found to be 35.1% and 31.8% respectively. Factors such as nuclear family of participants were associated with higher levels of depression. Individuals who belonged to nuclear families and had knowledge of TB symptoms and unfriendly behaviours from the health workers were more prone to induce the experience of anxiety. Family structure exhibited a consistent positive association with both depression and anxiety in bi-variate analysis.

Conclusion: The study findings highlight a high prevalence of anxiety and depression among TB patients. It is of utmost importance to underscore the critical significance of urban residency, as well as address the pressing necessity for a transformation in the attitudes of health workers. This shift is vital in ensuring that healthcare delivery effectively meets the diverse needs. Timely counselling for both patients and their families is crucial in mitigating anxiety and depression. It's essential to provide adequate counselling and impart TB related knowledge to address these mental health challenges effectively.

INTRODUCTION

TB continues to pose a significant challenge to global health despite the availability of timely diagnosis and suitable intervention.[1,2]A third of the world's population is estimated to be TB-positive, with the majority of cases occurring in low-income countries.[3]The poorest people in both high-income and developing nations are affected by tuberculosis.[4]

Depression is a common psychiatric disorder characterized by depressed mood, loss of interest in previously enjoyed activities, guilt or poor self-esteem, disturbed sleep or appetite exhaustion,

Correspondence:
Mr. Rajesh Kumar Yadav
Save the Children International
Kathmandu, Nepal
Email: rky0013@gmail.com
984621643

and trouble focusing. It can last for long stretches of time or reappear infrequently, severely impairing a person's ability to handle everyday activities and possibly leading to suicide.[5] Similarly, anxiety was the sixth most significant factor in non-fatal health losses and is estimated to affect 264 million people globally. It can also manifest as irrational avoidance of certain situations or objects as well as anxiety attacks.[6].[7]-

TB patients have high prevalence of depression and anxiety symptoms.[7] Patients with TB became stigmatized because community members without TB don't want to interact closely with them. Stigmatization continues to be a significant obstacle to eliminating TB by 2030, despite significant efforts made throughout the nation to build capacity[9], due to a variety of factors, including the protracted TB treatment regimen, the stigma the patient encounters as a result of the illness, and the lack of family support, a patient with TB may eventually experience depression. Patients with TB who had been diagnosed with symptoms of depression and were receiving cognitive therapy had a lower default rate and a greater rate of treatment completion.[10]

Healthcare facilities currently have fragmented care delivery, lacking adequate attention to mental health within TB programs, which results in insufficient care for TB patients. Integrating mental health into TB services is essential for both cost-effective and improved care and quality of life. Prolonged TB treatment can lead to mental and emotional issues in patients, impacting treatment adherence and effectiveness, potentially resulting in deaths and multidrug-resistant TB. Depression, specifically, is linked to disability, poor treatment outcomes, and increased mortality, emphasizing the necessity of addressing mental health within TB care to ensure successful treatment and patient well-being.[8, 11]

The incidence of depression and anxiety in TB patients is linked to non-compliance with therapy, which is thought to be the greatest obstacle to control TB. The risk of morbidity and mortality from the disease also increases as a result of treatment noncompliance. Patients' capacity to manage stress, pharmacological side effects and other aspects of daily life are negatively impacted by anxiety and depression.[12] Depression and lack of perceived control were independently associated with poor adherence.[13] Moreover, poor socioeconomic status, HIV/AIDS treatment non-adherence, perceived stigma, poor social support, substance use, being a woman, comorbid chronic illness, phase of treatment, family history of mental illness and sputum smear at time of diagnosis were significantly associated with anxiety and depression in patients with TB.[7]

Poor adherence to TB treatment not only increases the risk of negative outcomes but also poses a public health risk, potentially leading to community transmission and drug resistance emergence and affecting the quality of life. Psychosocial factors like medication side effects, stigma, isolation, and lack of support contribute to poor adherence, reflecting the psychological challenges individuals face upon acknowledging a TB diagnosis.[11]

TB is a significant global public health concern, with approximately 10 million people falling ill and 1.4 million dying from the disease each year (WHO). The co-occurrence of TB and mental health disorders can have severe consequences on treatment outcomes, quality of life, and overall health status.[14] The study aims to investigate the prevalence of anxiety and depression among TB patients in Kaski and identify the factors associated with these mental health conditions. By examining the interplay between physical health, mental health and socio-demographic factors, this study contributes to a more comprehensive understanding of the challenges faced by TB patients and informs the development of targeted interventions.

METHODOLOGY

Study design

A cross sectional study was conducted among Tuberculosis patients of Kaski district.

Study population

The study population was TB patients who were under Anti-tubercular medications from DOTs centres of Kaski district, Nepal.

Sample size and Sampling procedure

Sample size was calculated by using the following formula

$$N = \frac{z^2 pqN}{d^2(N-1) + z^2 pq}$$

Where,

Standard normal variate (z) = 1.96, at 95% Confidence interval

Estimated proportion (p) = 0.434 A study conducted by Duko. B, et al., 2015 showed that 43.4% participants had prevalence of depression and anxiety in TB patients[6]

Value of q = 1 – p

= 1 – 0.434 = 0.566

Allowable error (d) = 0.05

Total prevalence of TB patients in Kaski district (N) = 652[15]

Now, Sample size for finite population (n) =

n =239

$$\frac{1.96^2 \times 0.434 \times 0.566 \times 652}{0.05^2(652-1) + 1.96^2 \times 0.434 \times 0.566}$$

The total sample size of the study was 239. Total 239 patients of tuberculosis patients were interviewed through 5 local level of Kaski district, Nepal.

Sampling, Tools and Technique of Data Collection:

Data was collected proportionately as per the number of cases in each local level.

The sampling technique was probability sampling. All rural municipality/Municipality city was covered using different types probability sampling technique.

Stage 1: For the data collection, all the rural municipality/Municipality city of Kaski district was included.

Stage 2: The proportionate probability sampling technique was used to define sampling population from each local government. At the local level, where there is higher number of TB patients had a correspondingly larger number of respondents included in the sample.

Stage 3: Simple Random Sampling was used to select the TB patients of each Rural Municipality/ Municipality city of Kaski district.

Inclusion and Exclusion criteria

TB patients who have received DOTS for more than 15 days were included while patients not willing to participate and severely ill were excluded from the study.

Method of data collection

Data were collected through semi-structured questionnaire from the TB patients using face to face interview. The questionnaire were based on Socio-demographic characteristics, Lifestyle related questionnaire, Diseases related factors, and health related factors, PHQ-9 depression scale and Generalized Anxiety Disorder 7-item (GAD-7) scale.

Statistical information

The level of anxiety was categorized by PHQ-9 depression scale and Generalized Anxiety Disorder 7-item (GAD-7) scale into four groups as minimal, mild, moderate, and severe based on scoring 0–4, 5–9, 10–14, and 15–21, respectively. Minimal and mild response were merged and taken as having no anxiety (<10). Similarly, moderate and severe were merged and taken as anxiety (≥10). The level of depression was categorized into five groups as minimal, mild, moderate, moderately severe, and severe based on scoring 0–4, 5–9, 10–14,15–19, and 20– 27, respectively. Minimal and mild response were merged and taken as having no depression (<10). Similarly, moderate and severe were merged and taken as depression (≥10).[16]

After data collection the data was checked for completeness, compiled and coded daily after the completion of field activities. After this, all data was entered in the EPI-DATA software. Then data was refined to find out any errors such as coding errors and entry errors. The refined data was then exported to SPSS for further analysis. As the data collected and entered are quantitative, it was analyzed using descriptive and analytical statistics including frequencies, percentages and mean.

The association between dependent and independent variables was analyzed by using Chi-square test. Semi-structured questionnaire was used for pre testing by translating in Nepali. Pretesting of the tool was done among 10% homogeneous participants of Tanahun district. Data entry was done in epidata v4.2 that helped to avoid beyond limit error and for within limit 10% data was selected randomly and was checked manually.

RESULTS

Table 1: Socio-demographic characteristics of the respondents

Variables (n=239)	Frequencies	Percentage (%)
Age		
39 years	139	58.2
>39 years	100	41.8
Mean: 39 years (IQR=25 years) Minimum=16 years Maximum = 90 years		
Sex		
Male	132	55.2
Female	107	44.8
Religion		
Hindu	186	77.8
Buddhist	40	16.7
Muslim	7	2.9
Christain	5	2.1
Others	1	0.4
Ethnicity		
Dalit	34	14.2
Janajati	143	59.8
Madeshi	5	2.1
Muslim	6	2.5
Brahmin/ Chhetri	50	20.9
Others	1	0.4
Marital status		
Unmarried	76	31.8
Married	142	59.4
Separated	8	3.3
Divorce	2	0.8
Widowed	11	4.6
Type of family		
Nuclear	203	84.9
Joint	36	15.1

Variables (n=239)	Frequencies	Percentage (%)
Number of family members		
5	181	75.7
>5	58	24.3
Mean: 4.87 (IQR= 1) Minimum= 2 Maximum =14		
Residence		
Urban	226	94.6
Rural	13	5.4
Educational status		
Illiterate	8	3.3
Informal education	60	25.1
Basic education	60	25.1
Secondary education	92	38.5
Higher education	19	7.9
Occupation		
Unemployed	149	62.3
Private job	34	14.2
Labor	17	7.1
Farmer	8	3.3
Government job	3	1.3
Business	17	7.1
Others	11	4.6
Monthly income		
30000	125	52.3
>30000	114	47.7
Median: 30000 (IQR=30000) Minimum=0 Maximum = 200000		

Table 1 shows the socio-demographic status of the participants. The mean age of the participants was 39 years old with minimum of 16 years and maximum of 90 years old. Among the participants more than half (55.2%) were male. More than three-fourth (77.8%) follow Hinduism followed by Buddhism (16.7%). Nearly three-fifth (59.8%) of the participant was Janajati. Similarly, more than half (59.4%) were married. Most of the participant belongs to nuclear family (84.9%). The average family size is 4.87 per family with minimum of 2 to maximum of 14 members. Majority of the participants (94.6%) of the participant resides in the urban area.

Table 2: Diseases and lifestyle related factors		
Variables (n=239)	**Frequencies**	**Percentage (%)**
Currently smoking		
Never	137	57.3
Ever	81	33.9
Currently	21	8.8

Variables (n=239)	Frequencies	Percentage (%)
Consuming alcohol		
Never	142	59.4
Ever	95	39.8
Currently	2	0.8
Know symptoms about TB		
Yes	208	87.0
No	31	13.0
Symptoms of TB* (n=208)		
Blood cough	15	72.6
Fever	85	40.9
Chest pain	106	51.0
Weight loss	117	56.3
Fatigue	27	13.0
No appetite	41	19.7
TB treatment type		
PBC	127	65.7
PCD	30	12.6
EP	82	34.3
Type of TB on the basis of infection site		
Pulmonary	157	65.7
Extra pulmonary	82	34.3
Registration category		
New	219	91.6
Relapse	18	7.5
Loss to follow up	1	0.4
Failure	1	0.4
Phase of treatment		
Intensive phase	91	38.1
Continuous phase	148	61.9
Treatment other than TB		
Yes	44	18..4
No	195	81.6
Disease with TB*		
Asthma	6	13.6
Diabetes	11	25.0
Hyper/hypotension	14	31.8
Neurological diseases	5	11.4
Gastro intestinal diseases	3	6.8
Renal diseases	5	11.4
Thyroid	1	2.2
HIV/AIDS	3	6.8

Variables (n=239)	Frequencies	Percentage (%)
Family history of TB		
Yes	38	15.9
No	201	84.1
Face stigma		
Yes	64	26.8
No	175	73.2
Reason of stigma		
Anticipated stigma	23	35.9
Discrimination	22	34.4
Experience stigma	4	6.3
Negative perception	2	3.1
Perceived stigma	8	12.5
Self-stigma	5	7.8

*Multiple response questions

Table 2 shows the diseases and lifestyle related factors of the TB. More than nine-tenth (91.2%) had smoked once in a life while almost all (99.2%) had consumed alcohol once in their life time. Nearly nine-tenth (87%) has knowledge about the symptoms of the TB. Blood cough (72.6%) weight loss (56.3%), chest pain (51.0%) and fever (40.9%) were the major symptoms mentioned by the participants. Nearly seven-tenth (65.7%) had pulmonary TB. New cases of the TB (91.6%) were significant high in nature. Number of patients having continuous phase of treatment (61.9%) were higher than intensive phase (38.1). Nearly one-fifth (18.4%) have co-infection beside TB. More than one-fourth (26.8%) face some kind of the stigma and discrimination among which anticipated stigma was seen in (35.9%) and discrimination in (34.4%) cases.

Table 3: Health related factors of the participants		
Variables (n=239)	**Frequencies**	**Percentage (%)**
Time to reach DOTS centre		
15 minutes	163	68.2
>15 minutes	76	31.8
Median: 15 minutes (IQR=10 minutes) Minimum=0 Maximum = 180 minutes		
Use transport to reach DOTS centre		
Yes	154	64.4
No	85	35.6
Mode of transport to reach DOTS centre*		
Private vehicle	21	13.6
Bicycle	14	9.1
Motorcycle	79	51.3
Public vehicle	70	38.0
Transportation cost to reach DOTS centre		
NRs 50	118	76.4
>NRs 50	36	23.4
Median: Nrs 50(IQR: 20) Minimum : NRs 0, Maximum: NRs300		
Amount spend for TB diagnosis		
NRs 10000	111	52.9
>10000	99	47.1
Median: Nrs 10000 (IQR: 21500) Minimum : NRs 400, Maximum: NRs600000		

Variables (n=239)	Frequencies	Percentage (%)
Reference time to take DOTS services		
10-12 AM	84	35.1
12-2 PM	70	29.3
2-5 PM	6	2.5
Favourable time	79	33.1
Time favourable for you		
Yes	174	72.8
No	65	27.2
Health worker behaviour		
Very friendly	48	20.1
Friendly	183	76.6
Indifferent	3	1.3
Unfriendly	5	2.1
Enrol in health insurance		
Yes	57	23.8
No	182	7602
Renew health insurance (n=57)		
Yes	39	68.4
No	18	31.6

Table 3 shows the health system related factors of the participants. The median time to reach to the DOTS centre was 15 minutes. More than three-fifth (64.4%) had been using some kind of the transport to travel to DOTS centre. Motorcycle (51.3%) was the major mode of transport followed by public vehicle (38.0%). Most of the people travel DOTS centre in their favourable time. Nearly three-fourth (72.8%) mentioned that time to travel to DOTS centre is favourable to them. Majority of them mentioned that health workers were friendly to them.

Table 4: Level of depression and anxiety		
Characteristics	**Frequency**	**Percentage**
Depression		
Minimal	40	16.7
Mild	115	48.1
Moderate	74	31.0
Moderately severe	9	3.8
Severe	1	0.4
Anxiety		
Minimal	81	33.9
Mild	82	34.3
Moderate	73	30.5
Severe	3	1.3

Table 4 shows the level of depression and anxiety. Nearly half of the participants had mild depression followed by moderate, minimal and severe. Similarly, most of the participants had mild anxiety followed by minimal anxiety, moderate anxiety and severe anxiety.

Table 5: Relationship between socio-demographic and behaviour related variables with depression					
Variables	**Depression**		**p-value**	**UOR**	**95%CI**
	Yes 84(35.1%)	**No 155(64.9%)**			
Age					
39 years	49(35.3%)	90(64.7%)	0.968	0.989	0.577-1.695
>39 years	35(35%)	65(65%)		Ref	
Sex					
Male	41(31.1%)	91(68.9%)	0.143	1.491	0.874-2.544
Female	43(40.2%)	64(59.8%)		Ref	
Religion					
Hindu	69(37.1%)	117(62.9%)	0.239	0.669	0.343-1.305
Others	15(28.3%)	38(71.7%)		Ref	
Ethnicity					
Janajati	51(35.7%)	92(64.3%)	0.838	0.945	0.549-1.626
Others	33(34.4%)	63(65.6%)		Ref	
Marital status					
Married	52(36.6%)	90(63.4%)	0.564	0.852	0.495-1.468
Single	32(33.0%)	65(67.0%)		Ref	
Family type					
Nuclear	77(37.9%)	126(62.1%)	0.037*	0.395	0.165-0.945
Joint	7(19.4%)	29(80.6%)		Ref	
Family size					
5	67(37.0%)	114(63.0%)	0.286	0.705	0.372-1.339
>5	17(29.3%)	41(70.7%)		Ref	
Residence					
Urban	81(35.8%)	145(64.2%)	0.355	0.537	0.144-2.007
Rural	3(23.1%)	10(76.9%)		Ref	
Education status					
Basic and below	49(38.3%)	79(61.7%)	0.276	0.742	0.434-1.269
Secondary and above	35(31.5%)	76(68.5%)		Ref	
Occupation					
Unemployed	50(33.6%)	99(66.4%)	0.508	1.202	0.697-2.074
Employed	34(37.8%)	56(62.2%)		Ref	
Income					
30000	49(39.2%)	76(60.8%)	0.170	0.687	0.402-1.174
>30000	35(30.7%)	79(69.3%)		Ref	
Smoking					
Never	46(33.6%)	91(66.4%)	0.556	1.175	0.688-2.007
Ever	38(37.3%)	64(62.7%)		Ref	
Drinking alcohol					
Never	45(31.7%)	97(68.3%)	0.177	1.449	0.846-2.483
Ever	39(40.2%)	58(59.8%)		Ref	

*significant at p>0.05

Table 5 shows the unadjusted relationship between socio-demographic and behaviour related variable with depression. Among all variables type of family showed positive association with the depression (UOR=0.395, p-value=0.037).

Table 6: Relationship between health and diseases related variables with depression					
Variables	**Depression**		**P value**	**UOR**	**95% CI**
	Yes 84(35.1%)	**No 155(64.9%)**			
Know the symptoms of TB					
Yes	75(29.0%)	133(63.9%)	0.446	1.378	0.604-3.147
No	9(29.0%)	22(71.0%)		Ref	
Types of TB					
Pulmonary	51(32.5%)	106(67.5%)	0.234	1.400	0.805-2.435
Extra pulmonary	33(40.2%)	49(59.8%)		Ref	
Registration Category					
New	75(34.2%)	144(65.8%)	0.338	1.571	0.623-3.958
Previous case	9(45.0%)	11(55.0%)		Ref	
Phase of treatment					
Intensive	29(31.9%)	62(68.1%)	0.406	1.264	0.727-2.198
Continuous	55(37.2%)	93(62.8%)		Ref	
Treatment other than TB					
Yes	14(31.8%)	30(68.2%)	0.609	0.833	0.414-1.676
No	70(35.9%)	125(64.1%)		Ref	
Family history of TB					
Yes	12(31.6%)	26(68.4%)	0.616	0.827	0.394-1.737
No	72(35.8%)	129(64.2%)		Ref	
Face stigma					
Yes	23(35.9%)	41(64.1%)	0.877	1.048	0.577-1.096
No	61(34.9%)	114(65.1%)		Ref	
Time to reach DOTS					
15 minutes	56(34.4%)	107(65.6%)	0.708	1.115	0.632-1.965
>15 minutes	28(36.8%)	48(63.2%)		Ref	
Use of transport					
Yes	56(36.4%)	98(63.6%)	0.596	1..163	0.665-2.034
No	28(32.9)	57(67.1%)		Ref	
Cost to travel DOTS center					
50	42(35.6%)	76(64.4%)	0.719	1.152	0.534-2.484
>50	14(38.9%)	22(61.1%)		Ref	
Spent in TB treatment					
10000	40(36.0%)	71(64.0%)	0.725	1.106	0.631-1.937
>10000	38(38.4%)	61(61.6%)		Ref	
Time favorable					
Yes	62(35.6%0	112(64.4%)	0.797	1.082	0.594-1.972
No	22(33.8%)	43(66.2%)		Ref	
HW behavior					
Friendly	67(36.6%)	116(63.4%)	0.392	0.755	0.396-1.437
Unfriendly	17(30.4%)	39(69.6%)		Ref	
Enrollment in health insurance					
Yes	66(78.6%)	18(21.4%)	0.581	0.811	0.430-1.531
No	116(74.8%)	39(25.2%)		Ref	

Table 6 shows the unadjusted relationship between health and diseases related variables with depression. No any variables showed statistical significant association between independent variables and depression.

Table 7: Relationship between socio-demographic and behaviour related variables with anxiety					
Variables	**Anxiety**		**p-value**	**UOR**	**95%CI**
	Yes 76(31.8%)	**No 163(68.2%)**			
Age					
39	51(36.7%)	88(63.3%)	0.057	0.575	0.326-1.016
>39	25(25.0%)	75(75.0%)		Ref	
Sex					
Male	38(28.8%)	84(71.2%)	0.268	1.362	0.789-2.353
Female	38(35.5%)	69(64.5%)		Ref	
Religion					
Hindu	60(32.3%)	126(67.7%)	0.775	0.908	0.468-1.761
Others	16(30.2%)	37(69.8%)		Ref	
Ethnicity					
Janajati	50(35.0%)	93(65.0%)	0.201	0.691	0.392-1.217
Others	26(27.1%)	70(72.9%)		Ref	
Family type					
Nuclear	73(36.0%)	130(64.0%)	**0.003***	**0.162**	**0.048-0.546**
Joint	3(8.3%)	33(91.7%)		Ref	
Marital status					
Married	50(35.2%)	92(64.8%)	0.172	0.674	0.383-1.187
Single	26(26.8%)	71(73.2%)		Ref	
Family members					
5	64(35.4%)	117(64.6%)	0.039*	0.477	0.236-0.965
>5	12(20.7%)	46(79.3%)		Ref	
Residence					
Urban	73(32.3%)	153(67.7%)	0.491	0.629	0.168-2.354
Rural	3(23.1%)	10(76.9%)		Ref	
Education status					
Basic and below	38(29.7%)	90(70.3%)	0.832	0.941	0.539-1.645
Secondary and above	38(34.2%)	73(65.8%)		Ref	
Occupation					
Unemployed	46(30.9%)	103(69.1%)	0.692	1.120	0.640-1.959
Employed	30(33.3%)	60(66.7%)		Ref	
Income					
30000	41(32.8%)	84(67.2%)	0.728	0.908	0.526-1.567
>30000	35(30.7%)	79(69.3%)		Ref	
Smoking					
Never	41(29.9%)	96(70.1%)	0.472	1.223	0.707-2.117
Ever	35(34.3%)	67(65.7%)		Ref	
Drinking alcohol					
Never	42(29.6%)	100(70.4%)	0.373	1.285	0.740-2.230
Ever	34(35.1%)	63(64.9%)		Ref	

*significant at p>0.05

Table 7 shows the relationship between socio-demographic and behaviour related variable with anxiety. Family type showed the positive relationship with the anxiety (UOR= 0.162, p-value= 0.003).

Table 8: Relationship between health and diseases related variables with anxiety					
Variables	**Anxiety**		**p-value**	**UOR**	**95% CI**
	Yes 76(31.8%)	**No 163(68.2%)**			
Know the symptoms of TB					
Yes	72(34.6%)	136(65.4%)	**0.022***	**3.574**	**1.204-10.610**
No	4(12.9%)	27(87.1%)		Ref	
Types of TB					
Pulmonary	46(29.3%)	111(70.7%)	0.252	1.392	0.791-2.451
Extra pulmonary	30(36.6%)	52(63.4%)		Ref	
Registration Category					
New	67(30.6%)	152(69.4%)	0.191	1.856	0.735-4.689
Previous case	9(45.0%)	11(55.0%)		Ref	
Phase of treatment					
Intensive	30(33.0%)	61(67.0%)	0.761	0.917	0.524-1.603
Continuous	46(31.1%)	102(68.9%)		Ref	
Treatment other than TB					
Yes	11(25.0%)	33(75.0%)	0.286	0.667	0.317-1.404
No	65(33.3%)	130(66.7%)		Ref	
Family history of TB					
Yes	15(39.5%)	23(60.5%)	0.270	1.497	0.731-3.065
No	61(30.3%)	140(69.7%)		Ref	
Face stigma					
Yes	24(37.5%)	40(62.5%)	0.254	1.419	0.778-2.589
No	52(29.7%)	123(70.3%)		Ref	
Time to reach DOTS					
15 minutes	54(33.1%)	109(66.9%)	0.518	0.822	0.454-1.489
>15 minutes	22(28.9%)	54(71.1%)		Ref	
Use of transport					
Yes	55(35.7%)	99(64.3%)	0.082	1.693	0.936-3.063
No	21(35.7%)	64(75.3%)		Ref	
Cost to DOTS centre travel					
50	43(36.4%)	75(63.6%)	0.734	0.872	0.397-1.917
>50	12(33.3%)	24(66.6%)		Ref	
Spent in TB treatment					
10000	32(28.8%)	79(71.2%)	0.189	1.473	0.826-2.627
>10000	37(37.4%)	62(62.6%0		Ref	
Time favourable for you					
Yes	53(30.5%)	121(69.5%)	0.467	0.8	0.438-1.461
No	23(35.4%)	42(64.6%)		Ref	
HW behaviour					
Friendly	65(35.5%)	118(64.5%)	**0.028***	**0.444**	**0.215-0.917**
Unfriendly	11(19.6%)	45(80.4%)		Ref	
Enrolment in health insurance					
Yes	20(35.1%)	37(64.9%)	0.542	1.216	0.649-2.280
No	56(30.8%)	126(69.2%)		Ref	

Table 8 shows the relationship between health and diseases related variables with anxiety. People who were aware of the symptoms of TB fells anxiety 3.5 times more than people with no knowledge of symptoms (UOR=3.574, p=0.022). Health worker behaviour was found to be statistical associated with the anxiety (UOR=0.444, p=0.028).

DISCUSSION

The prevalence of depression was found to be 35.1% in our study. Similar prevalence was found to be India (35%)[17],and South Africa (38%) [18]. Studies of Nepal stated 10%[11] and 18%[3] of depression which is below than our study.[11]A study from Nepal on MDR TB reported less prevalence (22.2%) than our study. [11] Study from Turkey (26%) [2], Southern Ethiopia(19.82%)[19], Nigeria(7%)[20] have shown the prevalence lower than our study findings. Higher prevalence of depression was found in the study conducted in Pakistan (46.3% and 56%)[13, 21], Southwest Ethiopia (55.9%)[2], Eastern Ethiopia (51.9%)[5]and Southern Ethiopia (54.0% and 73%)[22]. Similarly, multiple studies from India also reported higher prevalence with 50%[10] and 84%[23] respectively. Study from China reported 52.7%[24] prevalence while Romania reported 78% of severe depression among the TB patients[20]. Another cohort study from Romania states that the prevalence was 46% while anxiety is 43%.[25] Similar study from Turkey states only 60.5% of the depression.[26]

Our study states that prevalence of the anxiety was found to be 31.8%. This finding is nearly similar to the study conducted in Cameroon (29.9%), China (29.3%) [27] and Turkey (26%)[26]. A study from Kathmandu Nepal reported 4% of anxiety among the TB patients which is less than our study.[3] Study from Romania shows that 20% of the case are severe in nature and seek medical attention. [20] Higher level of anxiety was seen in the study conducted in neighboring country Pakistan with prevalence of 47.2% and 65%.[13, 21] Prevalence of anxiety is greater in the studies from Southern Ethiopia (41.5%)[6] and Southwest Ethiopia.[2] Study form Uttar Pradesh, India shows the prevalence of 39% which is near to our study findings [17] Study from Turkey shows that the prevalence of depression and anxiety was 19% for recently diagnosed patients with TB, 22% with defaulted TB patients and 26% with patients with Multidrug resistance .[20]

The variation in prevalence and anxiety is seen due to various reasons. Our study has used PHQ-9 scale of depression and GAD-7 scale of anxiety for the calculations. The variation in uses of tools might be the reason for the variation in prevalence of the depression and anxiety. Besides that study design, study setting, sample variation and sample size factor may be responsible for the differentiation of output.

In our study no any socio-demographic and lifestyle related variables were associated with depression. A study from kathmandu Nepal showed that the socio -demographical and lifestyle variables like marital status, education, smoking and alcohol use shows the association with the depression but our study doesn't shows any relation with these variables.[11] Study from Rural Delhi states that Gender (0.016), employment status (0.00001), Education status (0.014), Family income (0.006), Socio-economic statue (0.017), Alcohol intake (0.003), and Tobacco use (0.00001) was associated with the depression. Age, family size and marital status did not appear to be associated with depression in the similar study which is consistent with our study [10] Study from MDR patients of Nepal shows the positive association of depression with gender and being single.[28]

In a primary setting of Ethiopia, increase in age was associated with increase in the depression among TB patients.[22] Age shows a protective effects in study of Eastern Ethiopia. Half of the participants below the age of the 25 years have depression [AOR = 0.5, 95% CI 0.26–0.99] [5] Older age (Adjusted Prevalence ratio (APR) = 1.19; 95%CI= 1.06, 1.33) and female sex (APR = 1.23; 95%CI= 1.18, 1.27) was significantly associated with the depression. [22] Depression is higher with increases in the age, being female and people who are single or widowed. [19] Increase in age reduces the physical activities in Nepal. Reducing the social engagement of patients to the community might make them lonelier which might be the reason for the increase in depression among increasing aged populations.

In our study education has not been significantly related with the depression. However, several studies have shown that education was closely associated with depression. People with no formal education [AOR= 3.03 95% CI (1.12, 8.23)] have more depression than educated people in the study of Southwest Ethiopia[2] while patients who have attended secondary or higher education were found to be negatively associated with depression (Adjusted Prevalence Ratio (APR) =1.23; 95%CI = 1.18, 1.27). Level of education was shown to be independently associated with depression in the study of Ethiopia. [22]Another study on rifampicin resistant patients in Romania

states that depression decreased with increase in the education status of the clients. Odds of depression decreased in patients with secondary and above level of education compared to lower education [OR=0.2, 95% CI: 0.1-0.8)[25] Higher level of education makes one more aware of TB related symptoms which may aid in reduction of the depressive symptoms.

Those with monthly income within the 25th percentile were at four times higher odds to have depression [AOR = 3.98, 95% CI: 2.15–7.39].[5] Study from Cameroon also shows the protective effect in the number of family size (AOR<1). But those having no income have higher odds in the depression in the same study.[27] No any socio-demographic variable was seen to associate with depression in the study from Jimma Ethiopia which is similar to our study. [19]

Various studies state that depression has significant association with the phase of treatment. [2]Depression was seen to be 3.3 times higher among patients in intensive phase of treatment [AOR= 3.33 95% CI (1.83, 6.07)]. Our study doesn't show any relationship between the phases.[23]Severity of diseases, duration of illness was significantly associated with depression in the study of Ethiopia but not with the category of treatment and initiation phase of treatment.[19] The reason could be because of patients with a prolonged chronic TB infection may experience more symptoms, which in turn can lead to the development of depressive symptoms due to the associated psychosocial pressures.

Our study didn't show any adjusted relationship with the perceived stigma. As study from Southern Ethiopia found that perceived TB stigma [AOR= 10.13 95% CI (5.52, 18.63)], had significant association with depression.[2] Another Southern Ethiopian study also states that patient who have perceived TB stigma are 11 times more likely to be depressed than other counterparts [AOR = 10.86, (95 % CI:10.26,23.47)] which is similar to a study of Pakistan.[6] Another study from Ethiopia states that newly diagnosed patients with TB were more likely to have associated depression (AOR = 0.39 (0.21–0.74). This is similar to a study in Lima, Peru. [5] Since the study was conducted in city area, there might be a low rate of the perception of stigma to the people. Beside that there are several health facilities for proper counselling which also plays positive role in uplifting the courage of TB patients.

Our study shows the adjusted relationship of family type and knowledge of symptoms of TB with anxiety. Family type shows protective effects among the participants (AOR=0.151). Study from Nepal shows that being single was significantly associated with anxiety among TB patients [AOR 0.2, 95%CI 0.03–1.0].[28]

Females had 2.4 times greater perceived anxiety than males [AOR =2.42 95% CI (1.39, 4.23)] in the study of Southwest Ethiopia. Additionally, various research have revealed that women are more likely than men to experience anxiety problems. The increased prevalence of anxiety in females compared to males may be attributed to differences in biological causes such as menstruation and social factors such as the load of household obligations.[2, 4, 26] Substance usage, presence of chronic illness, social support, perceived TB stigma, being female and treatment phase were all statistically associated with anxiety.[6] Study form Cameroon states that being unemployed was associated with reduced odds of anxiety.[27]

People with current anxiety was seen to be 3.5 times higher [AOR= 3.58 95% CI (1.99,6.42)] among TB patients who were found to have perceived TB stigma.[2] Another study also states that patients who had TB stigma feels more than three times anxiety [AOR = 3.11,(95 % CI:1.78,5.42)].[6] Our study doesn't show any relationship between anxiety and TB stigma. Different studies from Pakistan and Ethiopia shows that the stigma is highly associated with both depression and anxiety.[13, 26]

Phase of treatment also shows significant association with anxiety [AOR= 2.89 95% CI (1.62, 5.14)]. [2] Anxiety was seen to be 7.506 times higher among Extra Pulmonary TB patients than Pulmonary TB patients in the study of Cameroon [P = 0.004, AOR= 7.506, 95% CI: 1.880–29.968]. [27] Study from Southern Ethiopia states that phase of TB treatment shows significant association with anxiety. Patients in intensive phase perceive more anxiety than those in the continuation phase [AOR = 1.91, (95 % CI: 1.08, 3.39)] [6]A study from China states that compared to TB patients, MDR-PTB patients were more likely to suffer from anxiety, depression, TB-related stigma and low self-affirmation[29] Similar study among MDR patients in Nepal shows significant association between being single and anxiety [AOR 0.2, 95%CI 0.03–1.0] [28]

CONCLUSION

The prevalence of depression and anxiety among TB patients was found to be 35.1% and 31.8% respectively. Family type showed the positive association with both depression and anxiety. Similarly, family type, knowledge of TB symptoms and health workers behavior have statistical association with anxiety. Family member should be counseled and motivated. Behavior of health workers was one of the major factor of causing depression to the patients. Friendly behavior with proper guidance can be provide to the patient. Community awareness regarding tuberculosis should be done from grass root level health facilities.

ETHICAL APPROVAL

The permission to conduct study was obtained from La Grande International College and Health Division of five local level of Kaski district. The ethical approval for implementation of study was taken from Institutional Review Committee, Pokhara University. The purpose of the study was explained and informed consent was taken from each participant before conducting the interview and used only for the purpose of this study. The interview was taken privately at the place where they feel comfortable to express their views. No personal name of the participants was taken and unique identity number was used. Any respondent's decision on not to take part in the study was highly respected by trained interviewer.

CONFLICT OF INTEREST

None

ACKNOWLEDGEMENT

We would like to thank LA GRANDEE International College, Pokhara University, for providing opportunity ti conduct this research. We also like to thank Institutional Review Committee, Pokhara University for providing ethical clearance for the conduction of this research. We were grateful to health section of five local level of Kaski district for providing permission to conduct the study. Last not the least, we would like to thank all the participants who were involved in this study.

REFERENCES

1. World Health Organization. Global tuberculosis report 2021. Global tuberculosis report 2021 2022.
2. Mohammedhussein M, Alenko A, Tessema W, Mamaru A. Prevalence and Associated Factors of Depression and Anxiety Among Patients with Pulmonary Tuberculosis Attending Treatment at Public Health Facilities in Southwest Ethiopia. Neuropsychiatric disease and treatment. 2020;16:1095-104
3. Devkota J, Devkota N, Lohani SP. Health Related Quality of Life, Anxiety and Depression among Tuberculosis Patients in Kathmandu, Nepal. Janaki Medical College Journal of Medical Science. 2017;4(1):13-8.
4. Anye LC, Agbortabot Bissong ME, Njundah AL, Siewe Fodjo JN. Depression, anxiety and medication adherence among tuberculosis patients attending treatment centres in Fako Division, Cameroon: cross-sectional study. BJPsych open. 2023;9(3):e65.
5. Dasa TT, Roba AA, Weldegebreal F, Mesfin F, Asfaw A, Mitiku H, et al. Prevalence and associated factors of depression among tuberculosis patients in Eastern Ethiopia. BMC psychiatry. 2019;19:1-7.
6. Duko B, Gebeyehu A, Ayano G. Prevalence and correlates of depression and anxiety among patients with tuberculosis at WolaitaSodo University Hospital and Sodo Health Center, WolaitaSodo, South Ethiopia, Cross sectional study. BMC psychiatry. 2015;15:1-7.
7. Assefa S, Boru B, Gebeyehu DA, Terefe B. Depression, anxiety and their associated factors among patients with tuberculosis attending in Gondar city health facilities, North West Ethiopia. BMC psychiatry. 2023;23(1):1-9.
8. Sunjaya DK, Paskaria C, Pramayanti M, Herawati DMD, Parwati I. The magnitude of anxiety and depressive symptoms among tuberculosis patients in community health centers setting during the peak of COVID-19 pandemic. Journal of Multidisciplinary Healthcare. 2022:755-64.
9. Huq KE, Moriyama M, Krause D, Shirin H, Awoonor-Willaims JK, Rahman M, et al. Perceptions, Attitudes, Experiences and Opinions of Tuberculosis Associated Stigma: A Qualitative Study of the Perspectives among the Bolgatanga Municipality People of Ghana. International Journal of Environmental Research and Public Health. 2022;19(22):14998.

10. 10.Kamble B, Dhaked S, Mahaur G, Prasad B, Kumar P, Dhaked GK, et al. Depression Among Patients With Tuberculosis at a Directly Observed Treatment Short-Course (DOTS) Center in Rural Delhi. Cureus. 2022;14(10).

11. Shrestha P, Subba U, Brouwer M, Sweetland A. Depression among TB patients and associated factors in Kathmandu Valley, Nepal. Global Mental Health. 2020;7:e4.

12. Mohammedhussein M, Alenko A, Tessema W, Mamaru A. Prevalence and associated factors of depression and anxiety among patients with pulmonary tuberculosis attending treatment at public health facilities in Southwest Ethiopia. Neuropsychiatric disease and treatment. 2020:1095-104.

13. Husain MO, Dearman SP, Chaudhry IB, Rizvi N, Waheed W. The relationship between anxiety, depression and illness perception in tberculosis patients in Pakistan. Clinical practice and epidemiology in mental health. 2008;4:1-5.

14. Organization WH. WHO consolidated guidelines on drug-resistant tuberculosis treatment: annexes 3-9. World Health Organization, 2019.

15. Health Directorate Gandaki Province Nepal. Annual Report 2077/78. 2021.

16. Yadav RK, Baral S, Khatri E, Pandey S, Pandeya P, Neupane R, Yadav DK, Marahatta SB, Kaphle HP, Poudyal JK, Adhikari C. Anxiety and depression among health sciences students in home quarantine during the COVID-19 pandemic in selected provinces of Nepal. Frontiers in Public Health. 2021 Mar 1;9:580561.

17. Kumar K, Kumar A, Chandra P, Kansal HM. A study of prevalence of depression and anxiety in patients suffering from tuberculosis. Journal of family medicine and primary care. 2016;5(1):150.

18. Thungana Y, Wilkinson R, Zingela Z. Comorbidity of mental ill-health in tuberculosis patients under treatment in a rural province of South Africa: a cross-sectional survey. BMJ open. 2022;12(11):e058013.

19. .Adem A, Markos T, Mohammed A. The prevalence and pattern of depressıon in patıents with tuberculosis on follow-up at jimma university specialized hospital and jimma health center. Med Sci. 2013;3(1):955-68.

20. Adina M, Necrelescu OL, Bondor C, Trofor A, Alexandrescu D, Dantes E, et al. Depressive syndrome, anxiety and illness perception in Tuberculosis patients. Recent Researches in Modern Medicine. 2011;978(3):243-8.

21. Rizvi N. Frequency of depression and anxiety among tuberculosis patients. Journal of Tuberculosis Research. 2016;4(04):183.

22. Ambaw F, Mayston R, Hanlon C, Alem A. Burden and presentation of depression among newly diagnosed individuals with TB in primary care settings in Ethiopia. BMC psychiatry. 2017;17(1):57.

23. Mandaknalli DR, Giriraj DB, editors. Prevalence of Depression in Tuberculosis Patients in a Tertiary Care Hospital2015.

24. Fang X-H, Wu Q, Tao S-S, Xu Z-W, Zou Y-F, Ma D-C, et al. Social support and depression among pulmonary tuberculosis patients in Anhui, China. Journal of Multidisciplinary Healthcare. 2022:595-603.

25. Stoichita A, Dumitrescu A, Ciobanu A, Oancea C, Petronela F, Dabja R, et al. Depression and anxiety symptoms among people with rifampicin-resistant tuberculosis receiving in-patient care in the National Pulmonology Reference Institute in Romania. Monaldi archives for chest disease = Archivio Monaldi per le malattie del torace. 2021;91(1).

26. Yilmaz A, Dedeli O. Assessment of anxiety, depression, loneliness and stigmatization in patients with tuberculosis. Acta Paulista de Enfermagem. 2016;29:549-57.

27. .Anye LC, Bissong MEA, Njundah AL, Fodjo JNS. Depression, anxiety and medication adherence among tuberculosis patients attending treatment centres in Fako Division, Cameroon: cross-sectional study. BJPsych open. 2023;9(3):e65.

28. Walker IF, Kanal S, Baral SC, Farragher TM, Joshi D, Elsey H, et al. Depression and anxiety in patients with multidrug-resistant tuberculosis in Nepal: an observational study. Public health action. 2019;9(1):42-8.

29. Liu K, Zhang Y, Qu S, Yang W, Guo L, Zhang L. Prevalence and correlates of anxiety and depressive symptoms in patients with and without multi-drug resistant pulmonary tuberculosis in China. Frontiers in psychiatry. 2021;12:674891.