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ORIGINAL ARTICLE

Assessment of Rifampicin Resistance in Presumptive Tuberculosis Cases at Dadeldhura Hospital of Sudurpaschim Province of Nepal

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ABSTRACT

Objectives: This study sought to determine the prevalence of rifampicin-resistant tuberculosis (RR-TB) and *Mycobacterium tuberculosis* (MTB) in patients at Dadeldhura Hospital in Nepal who were suspected of having pulmonary tuberculosis. The study's primary objectives were to assess the prevalence of MTB and RR-TB and to identify related sociodemographic variables.

Methodology: About 2122 patients visited to Dadeldhura Hospital in January to December 2023 for diagnosis of TB were enrolled in this cross-sectional study. The GeneXpert MTB/RIF assay was performed for molecular detection of rifampicin resistance gene present in sputum samples. The patients record in hospital and GeneXpert MTB/RIF assay were analysed to determine the prevalence and demographic correlations of TB and RR-TB.

Result: Out of 2122 patients, 140 (6.7%) were identified with tuberculosis. Males had a higher prevalence (8.7%) than females (3.7%), with the highest detection rate in the 36-50 years age group (27.1%). Among TB cases, 12 (8.6%) were identified as RR-TB. No significant correlations were found between TB or RR-TB detection and sociodemographic factors such as ethnicity, locality and occupation.

Conclusion: This study highlights the high prevalence of TB and the alarming emergence of improved diagnostic and treatment strategies. The findings stress the importance of targeted public health interventions, particularly for high-risk groups, to combat TB effectively and address the challenge of drug resistance.

Keywords
Epidemiological Analysis, Multidrug-Resistant Tuberculosis (MDR-TB), Presumptive Case, Resistance Patterns, Dadeldhura Hospital, Mycobacterium Tuberculosis, GeneXpertMTB/RIF

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INTRODUCTION

Tuberculosis (TB) continues to reign as the most common cause of death related to infectious disease worldwide[1]. In 2022, tuberculosis was the largest drug-resistant airborne epidemic, accounting for over a billion deaths in the previous two centuries in the world[2,3]. In the 1940s, effective treatments for *M. tuberculosis* were developed, with drug-susceptible tuberculosis (DS-TB) being made curable with a 6-month regimen of isoniazid, rifampicin, pyrazinamide, and ethambutol (HRZE), and sometimes shorter 4-month regimens[4]. However, resistance to these first-line drugs, particularly rifampicin and isoniazid, has developed, complicating treatment. This resistance is caused by genetic mutations in the bacterium, such as mutations in the *rpoβ* gene that confer resistance to rifampicin by reducing the drug's binding affinity to the RNA polymerase enzyme[5]. With slight technical assistance, the

automated Xpert® MTB/RIF test can identify rifampicin resistance and tuberculosis in two hours. Early in 2011, the World Health Organization (WHO) released preliminary guidelines for its application. In January 2013, a Cochrane Review was published regarding the diagnostic accuracy of Xpert® MTB/RIF for pulmonary tuberculosis and rifampicin resistance[6].

Many developing countries practices traditional TB treatment without drug susceptibility testing (DST), which is thought to increase the risk of transmitting drug-resistant strains[7,8]. It is generally accepted that the most effective surveillance strategy for tracking trends in drug-resistant TB is routine testing of all TB patients[9]. In Nepal, significant cause of death is drug-resistant tuberculosis (DRTB). Claiming around 17,000 lives annually and imposing significant social and economic burdens. The battle against TB in Nepal is hindered by long and complex treatment regimens, high treatment costs, and diagnostic challenges[10].

"According to a global report, Nepal's annual burden of drug-resistant tuberculosis (DR-TB) was estimated to be 2,900 cases in 2022." Nepal notified 693 DR-TB and 189 to 265 MDR cases in FY 2079/80 (2022/2023), enrolling 546 for treatment. Controlling MDR-TB requires patient compliance and effective case management, not just new antibiotics[11]. DR-TB deaths account for one-third of all antimicrobial resistance deaths globally, with a global treatment success rate for MDR/RR-TB of only 56%[12], Information regarding the extent of RR and related factors in the study area is scarce. Therefore, the aim of the research was to assess the prevalence of RR-MTB and the factors that are associated with it among those who were suspected of having pulmonary tuberculosis (PTB) and had visited Dadeldhura Hospital during the study period.

MATERIALS AND METHODS

Study Setting and Duration

This study was carried out in Daldedhura Hospital in 2023. It is the sole specialist hospital under the federal government in Sudurpaschim Province, serves as a crucial healthcare provider for seven hilly districts in the region. It is teaching hospital of Far Western University and located at head quarter of Dadeldhura District. The Nepal government plans to expand the hospital into a 500-bed facility to enhance its service capabilities.

Study Design and Population

Patients suspected of having pulmonary tuberculosis (PTB) were the subjects of this retrospective cross-sectional study. Patients who met the inclusion criteria and came in for a TB diagnosis and treatment during the study period were included in the study. All age groups with TB symptoms had to take the GeneXpert MTB/RIF test in order to be eligible. Patients with insufficient clinical and demographic data were not included.

Data Collection Method

A structured questionnaire and checklist were used to gather data. MTB and rifampicin resistance results from the GeneXpert/MTB assay, as well as patient demographics (number of years, gender, race, and residence location), were retrospectively evaluated from laboratory records spanning 12 months in 2023.

Sample Preparation and Analysis Using GeneXpert® MTB/RIF

For each sputum sample, the lid of the collection container was removed, and sample reagent was added at a ratio of 2:1 (volume/volume) to the sputum. The container was then resealed and shaken vigorously 10–20 times to ensure thorough mixing. The mixture was incubated at room temperature for 15 minutes, during which the sample was shaken vigorously again 10–20 times between 5 and 10 minutes of the incubation period to enhance homogenization. The sample was observed to ensure liquefaction with no visible clumps of sputum. Non-sample particulate matter was noted but excluded from further processing. Using a sterile plastic transfer pipette, at least 2 mL of the processed sample was carefully transferred from the collection container into a single-use, disposable, self-contained GeneXpert cartridge. The cartridge was then placed in the GeneXpert® MTB/RIF system for analysis. The test was conducted according to the manufacturer's protocol, and the results were recorded after approximately 2 hours[13].

Variables

The dependent variables studied were TB and rifampicin-resistance TB, with covariates including age of patients, sex, race, and residential location.

Statistical Analysis

Data entry was analysed by SPSS version 25 for analysis. The mean and standard deviation were used as descriptive statistics. The percentage of patients with RR-MTB was used to calculate the prevalence of RR-TB. To find the variables linked to RR-MTB, bivariate and multivariable analyses were conducted. Variables with a p-value of less than 0.05 in the bivariate analysis were candidates for the multivariable analysis. The association between RRMTB and independent variables was measured using an adjusted odd ratio (AOR) at 95% confidence interval (CI). When the p-value was less than 0.05, statistical significance was taken into account.

Ethical Consideration

Permission to conduct this research was duly requested and granted by the hospital authority. This study is retrospective in nature; we collected and analysed the secondary data hence, obtaining informed consent from patients was not required as no direct patient contact or intervention occurred. However, strict measures were implemented to maintain the confidentiality of patient information. All patient data were anonymized and securely stored to ensure privacy, and the research adhered to ethical principles as outlined in relevant guidelines, including respect for patient confidentiality and data protection.

RESULT

Rifampicin-resistant tuberculosis (RR-TB) prevalence among lung TB patients at Dadeldhura Hospital, is shown in Table **1.** There were 1114 males (52.5%) and 1008 females (47.5%) among the 2122 presumed TB cases. Among 2122 TB presumptive people, 140 patients had TB, with males having a higher detection rate (73.6%) than females (26.4%). The overall TB detection rate was 6.6%. Males had a significantly higher positivity rate for TB detection (4.9%) compared to females (1.8%). Of the TB cases that were found, 12 had an 8.6% RR-TB positive rate; males made up 75.5% of RR-TB cases, while females made up 25.0%. Males had a 6.4% and females had a 2.2% RR-TB positivity rate, which was not statistically significant.

Regarding the age distribution, the patients' mean age was 47.51 years, with a standard deviation of 21.491 years, and their median age was 50 years. RR-TB positivity and TB detection varied by age group. Both the highest RR-TB positivity (3.6%) and the highest TB detection rate (27.1%) were found in patients aged 36 to 50. The lowest RR-TB positivity rate (0.7%) and TB detection rate (9.3%) were found in the youngest age group (0–20 years). While RR-TB positivity rates did not significantly vary but there were significant differences in TB detection rates between age groups.

According to an ethnic group analysis, Dalits accounted for 30.4% of presumed TB cases, with an RR-TB positivity rate of 2.2% and a TB detection rate of 27.9%. With a TB detection rate of 71.4% and an RR-TB positivity rate of 6.4%, Brahmin/Kshetri accounted for 67.2% of presumptive TB cases. The differences in TB detection and RR-TB positivity rates across ethnic groups were not statistically significant.

The Dadeldhura district consists of seven municipalities, out of which two are urban and five rural municipalities. Among this geographical location, the highest number of presumptive TB cases originated from the "Others" (Non-residential of Dadeldhura) patients (20.2%), followed by Amargadhi Municipality (19.3%) and Ajayameru Rural Municipality (15.3%), while the lowest cases were reported from Parasuram Municipality (1.3%). Out of the total screened, 140 patients (6.6%) were confirmed to have TB. The "Others" category exhibited the highest TB detection rate with a positivity rate of 3.2%, whereas Amargadhi Municipality and Ajayameru Rural Municipality each had a detection rate of 0.7%, which was higher than that of Parasuram Municipality (0.0%) and Nawaduraga Rural Municipality (0.4%). The highest RR-TB positivity rate was found in the "Others" category at 3.6%, while Amargadhi Municipality and Nawaduraga Rural Municipality each had a positivity rate of 1.4%. No RR-TB positive cases were reported in Parasuram Municipality and Ganyapdhura Rural Municipality. The statistical significance (p-values) for the impact of locality on TB detection and RR-TB positivity were 0.00 and 0.649, respectively, suggesting a significant effect of locality on TB detection but not on RR-TB positivity.

Overall, the findings indicate significant differences in TB detection rates across gender, age groups, and localities, but RR-TB positivity rates did not vary significantly across these sociodemographic factors.

In the multivariate logistic regression analysis of sociodemographic factors linked to drug-sensitive tuberculosis (DS-TB), gender was a significant factor, as Table **2** illustrates. With an adjusted odd ratio (AOR) of 0.422 and a crude odd ratio (COR) of 0.374, females were less likely than males to have DS-TB. Conversely, males had higher odds, with a COR of 2.674 and an AOR of 2.367. This indicates a significant gender disparity, with males being more likely to have DS-TB than females. The odds ratio for individuals aged 35 or younger was 0.809 (COR: 0.557, 1.175) and 0.846 (AOR: 0.565, 1.267), indicating no significant difference compared to those older than 35 years. Similarly, the odds ratio for those aged 36 or older was 1.236 (COR: 0.851, 1.795) and 1.182 (AOR: 0.789, 1.770), with no significant association found.

Additionally, there was no discernible correlation between ethnic group and DS-TB. For Dalit people, the crude model's odds ratio was 0.849 (95% CI: 0.579, 1.245) while the adjusted models were 0.915 (95% CI: 0.622, 1.347). In the crude model, the odds ratio for Brahmin/Kshetri individuals was 0.282 (95% CI: 0.039, 2.066) with a p-value of 0.213, and in the adjusted model, it was 0.300 (95% CI: 0.041, 2.207) with a p-value of 0.237. According to these findings, DS-TB in this study was not significantly predicted by ethnic group.

Table 1. The Frequency of RR-TB Among Pulmonary TB Patients in the Dadeldhura District of Nepal in 2023 (N = 2122).

Characteristics	Presumptive TB		TB Detected			RR-TB Positive		
	Number	%	Number	%	Positivity %	Number	%	Positivity %
Gender	p value = 0.000					p value = 0.117		
Female	1008	47.5	37	25.8	1.7	3	25.0	2.2
Male	1114	52.5	103	74.2	4.9	9	75.0	6.4
Total	2122	100	140	100	6.6	12	100	8.6
Age group	P=0.007					P=0.280		
0-20	289	13.6	13	9.3	0.6	1	8.3	0.7
21-35	440	20.7	29	20.7	1.4	1	8.3	0.7
36-50	349	16.4	38	27.1	1.8	5	41.7	3.6
51-65	530	25.0	35	25.0	1.7	3	25.0	2.1
66-80	460	21.7	24	17.1	1.1	2	16.7	1.4
81-100	56	2.6	1	0.7	0	0	0.0	0.0
Ethnic group	p=492					p=0.917		
Dalit	648	30.5	39	27.9	1.8	3	25.0	2.1
Janajati	49	2.3	1	0.7	0.1	0	0.0	0.0
Bhrahmin/Kshetri	1427	67.2	100	71.4	4.7	9	75.0	6.4
Locality	p=0.00					p=0.649		
Amargadhi M	410	19.3	15	10.7	0.7	2	16.7	1.4
BhageswarRM	201	9.5	10	7.1	0.5	1	8.3	0.7
Ganyapdhura RM	193	9.1	12	8.6	0.6	0	0.0	0.0
Ajayameru RM	326	15.3	15	10.7	0.7	1	8.3	0.7
Parasuram M	27	1.3	1	0.7	0.0	0	0.0	0.0
Nawaduraga RM	233	11.0	8	5.7	0.4	2	16.7	1.4
Aalital RM	304	14.3	13	9.3	0.6	1	8.3	0.7
Others	430	20.2	66	47.1	3.2	5	41.7	3.6

Table 2. Sociodemographic Characteristics Linked to DS-TB at Dadeldhura Hospital in Nepal, Using Multivariate Logistic Regression Analysis (N=2122).

Parameter	COR, 95% CL (L, U)	p value	AOR, 95%CI (L, U)	p value
Gender				
Female	0.374 (0.254, 0.550)	0.000	0.422 (0.280, 0.637	0.000
Male	2.674 (1.818, 3.933)		2.367 (1.569, 3.571)	
Age group				
≤35	0.809 (0.557, 1.175)	0.266	0.846 (0.565, 1,267)	0.418
≥36	1.236 (0.851, 1.795)		1.182 (0.789, 1.770)	
Ethnic group				
Dalit	0.849 (0.579, 1.245)	0.402	0.915 (0.622, 0.1.347	0.653
Brahmin/Kshetri	0.282 (0.039, 2.066)	0.213	0.300 (0.041, 2.207	0.237
Locality				
Amargadhi M	0.00	1	0.00	1
Bhageshwar RM	0.212 (0.119, 0.378)	0.00	0.261 (0.145, 0.472)	0.00
Ganyapdhura RM	0.289 (0.145, 0.574)	0.00	0.310 (0.154, 0.6240	0.001
Ajayameru RM	0.364 (0.192, 0.690)	0.002	0.432 (0.225, 0.831)	0.012
Parshuram M	0.266 (0.149, 0.690)	0.00	0.312 (0.172, 0.564)	0.00
Navaduraga RM	0.424 (0.098, 1.830)	0.250	0.386 (0.087,1.703)	0.209
Aalital RM	0.194 (0.091, 0.411)	0.00	0.197 (0.03, 0.0.422)	0.00
Others	0.246 (0.133, 0.455)	0.00	0269 (0.141,0.514)	0.00

Note: CI (confidence interval), U (upper), L (lower), COR (crude odds ratio), and AOR (adjusted odds ratio).

Table 3. Sociodemographic Factors Associated with DR-TB Analysis by Multivariate Logistic Regression in Dadeldhura Nepal (N=2122).

Variables	COR, 95% CL (L, U)	p value	AOR, 95%CI (U. L)	p value
Gender				
Female	0.367 (0.009, 1.358)	0.133	0.401 (0.106, 1.515)	0.178
Male	2.729 (0.737, 10.107)		2.604 (0.698, 9.715	0.154
Age group				
≤35	0.381 (0.083, 1.744)	0.214	0.405 (0.087,1.892)	0.250
≥36	2.623 (0.573, 12.001)		2.470 (0.529, 11.541)	
Ethnic group				
Dalit	0.681 (0.184, 2.522)	0.565	0.779 (0.202, 2.999)	0.716
Brahmin/Kshetri	1.469 (0.397, 5.444)		1.284 (0.333, 4.496)	
Residential				
Urban	1.063 (0.511, 2.212)	0.870	1.503 (0.287, 7.863)	0.689
Rural	0.941 (0.452, 1.957)		0.665 (0.127, 3.479)	

Significant differences in odds ratios between localities were found in the multivariate logistic regression analysis assessing the relationship between locality and drug-sensitive tuberculosis (DS-TB). The reference group, Amargadhi Municipality, had a value of 1. Among other localities, Bhageshwar Rural Municipality had a significantly lower risk of DS TB AOR of 0.261 (95% CI: 0.145, 0.472) and crude odds ratio (COR) of 0.212 (95% CI: 0.119, 0.378) for tuberculosis (TB). Additionally, Ganyapdhura Rural Municipality demonstrated a lower risk, for a COR of 0.289 (95% CI: 0.145, 0.574) and an AOR of 0.310 (95% CI: 0.154, 0.624). The AOR and COR

for Ajayameru Rural Municipality were 0.432 (95% CI: 0.225, 0.831) and 0.364 (95% CI: 0.192, 0.690), Parshuram Municipality also indicated a lower risk with a COR of 0.266 (95% CI: 0.149, 0.690) and an AOR of 0.312 (95% CI: 0.172, 0.564). On the other hand, Navaduraga Rural Municipality displayed a non-significant difference with a higher COR of 0.424 (95% CI: 0.098, 1.830) and an AOR of 0.386 (95% CI: 0.087, 1.703). The risk was significantly lower in Aalital Rural Municipality for both the COR (0.194, 95% CI: 0.091, 0.411) and the AOR (0.197, 95% CI: 0.093, 0.422). The "Others" category also showed a lower risk, with an AOR of 0.269 (95% CI: 0.141, 0.514) and a COR of 0.246 (95% CI: 0.133, 0.455). These results highlight significant geographic disparities in DS-TB risk, with certain localities showing substantially lower odds of the disease.

Gender was not a significant predictor in the multivariate logistic regression analysis used to evaluate sociodemographic factors linked to drug-resistant tuberculosis in Table **3**. For females, the analysis revealed that the adjusted odds ratio (AOR) was 0.401 (95% CI: 0.106, 1.515) and the crude odds ratio (COR) was 0.367 (95% CI: 0.009, 1.358). On the other hand, the AOR was 2.604 (95% CI: 0.698, 9.715) and the COR was 2.729 (95% CI: 0.737, 10.107) for males. These findings imply that the likelihood of having DR-TB in this study is not substantially influenced by gender.

P-values showed no significant difference in the crude odds ratio (COR) of 0.381 (95% CI: 0.083, 1.744) and adjusted odds ratio (AOR) of 0.405 (95% CI: 0.087, 1.892) for those under the age of 35 years. The COR and AOR for those aged 36 years and over were 2.623 (95% CI: 0.573, 12.001) and 2.470 (95% CI: 0.529, 11.541), respectively, but they were not statistically significant. Ethnicity-wise, there were no significant differences between Brahmin/Kshetri and Dalit individuals, with the former having a COR of 1.469 (95% CI: 0.397, 5.444) and an AOR of 1.284 (95% CI: 0.333, 4.496) and a COR of 0.681 (95% CI: 0.184, 2.522) and an AOR of 0.779 (95% CI: 0.202, 2.999).

In terms of residential area, the COR for urban residents was 1.063 (95% CI: 0.511, 2.212) and the AOR for rural residents was 0.941 (95% CI: 0.452, 1.957) and the AOR for rural residents was 0.665 (95% CI: 0.127, 3.479). All p-values showed no significant difference. Overall, this study found no significant correlation between these sociodemographic factors and DR-TB.

DISCUSSION

Among presumptive TB patients, in this study shows noteworthy results about the prevalence of MTB and RR-TB. The study found that 6.6% of people had MTB. Other studies conducted in Addis Ababa (6%)[14], the Amhara region (8%)[15], and Uganda (5.5%)[16] corroborated this prevalence. Males were statistically significantly more likely to have TB (4.9%) than females (1.8%; p=0.00). RR-TB was not related to gender, as evidenced by the higher prevalence of RR-TB in males (6.4%) compared to females (2.2%), with a p-value of >0.05. In total, 8.6% of people had RR-TB. Comparable to findings[17], 8.3% in Ethiopia, 8.7% in Tigray, and Northern Ethiopia[18], this result was marginally higher than studies[19], 6.8% in Nigeria, 5.9% in Zambia[20] and 3% in Nepal[21]. Males were predominantly infected with rifampicin-resistant tuberculosis (RR-TB), a trend observed in other studies from Nigeria[22], India[23], and Tanzania[24]. This gender disparity may be due to men being more exposed to factors leading to rifampicin resistance, such as overcrowding in marketplaces, poor adherence to treatment, smoking, and alcoholism, which increase their susceptibility. The elevated RR-TB rates in males could be attributed to behavioural factors, such as higher rates of smoking or alcohol use, which are associated with increased TB risk and poorer treatment adherence.

Our study identified the highest prevalence of MTB in the age groups of 36-50 and 51-65 years, each exhibiting a prevalence rate of 1.9%. With a significant p-value of 0.007, this result points to a significant correlation between MTB prevalence in these demographic cohorts and age. Similar age-specific patterns were noted by[25] they found that MTB was more common in Ethiopia among people between the ages of 36 years and 53 years.

On the other hand, another study found that the age group of 31 to 40 years old had the highest percentage of GeneXpert-positive MTB cases[26] which is similar to our finding. Especially those aged 36-50 and 51-65 years, were more susceptible to MTB might be due to weakened immune function, chronic health conditions, longer exposure to TB environments, occupational risks, and socioeconomic factors. Behavioral factors like smoking

and alcohol use also may play a role regarding TB prevalence. The age group of 36 to 50 years old had the highest prevalence of RR-TB in our study. However, p > 0.05 indicated that this association was not statistically significant. This finding suggests that while there is an observable trend of higher RR-TB prevalence in this age group, the data does not provide strong evidence of a significant age-related difference in RR-TB prevalence. Others reported 0–20 years and 61–80 years[27]. These trends highlight the need to consider demographic and epidemiological factors in TB prevalence analysis.

In the present study Dalits were the largest group of presumptive TB cases (30.4%), they have a relatively low RR-TB positivity rate of 2.2%. Brahmin/Kshetri individuals, despite representing a large proportion of cases, have a higher RR-TB positivity rate of 6.4%. The differences in RR-TB rates across ethnic groups are not statistically significant (p=>0.05), suggesting that other factors might contribute to these variations may play a more critical role in RR-TB prevalence than ethnicity alone.

The analysis showed that the "Others" category, which included patients from areas outside of Dadeldhura District, had the highest prevalence rates of rifampicin-resistant tuberculosis (RR-TB) and drug-sensitive tuberculosis (DS-TB), at 3.2% and 3.6%, respectively. Among localities within the district, Amargadhi Municipality, an urban setting, exhibited the highest DS-TB prevalence at 0.7%, with this finding being statistically significant (p=0.00). This suggests that urban environments, characterized by overcrowding and poor ventilation, may contribute to increased TB burden. Conversely, RR-TB prevalence was highest in both Amargadhi Municipality and Nawadurga Rural Municipality, each showing a rate of 1.4%. However, the lack of statistical significance (p=0.649) indicates that locality alone may not be a strong predictor of RR-TB prevalence, suggesting that other factors may influence the distribution of RR-TB.

Geographic and gender differences were found to be significant in the multivariate logistic regression analysis of sociodemographic factors linked to drug-sensitive tuberculosis (DS-TB). Both crude and adjusted odds ratios showed a significant protective effect for females, suggesting that they had a significantly lower risk of developing DS-TB than males. On the other hand, DS-TB was more common in men, indicating a clear gender gap. In addition, locality was important; a number of places, such as Bhageshwar, Ganyapdhura, Ajayameru, Parshuram, Aalital, and the "Others" category, had much lower DS-TB risks than the reference locality, Amargadhi Municipality. These results imply that geographic location and gender play a significant role in the prevalence of DS-TB, with distinct localities showing noticeably varying risk levels.

The need for focused public health interventions based on gender and geographic risk factors is further highlighted by the lack of significant associations for age, ethnic group, and residential area. Regarding sociodemographic factors linked to drug-resistant tuberculosis (DR-TB), the multivariate logistic regression analysis revealed no significant correlations with residential area, gender, age group, or ethnic group. Both female and male patients, as well as those younger than 35 and older than 36 years, did not exhibit significant differences in DR-TB risk. Similarly, the ethnic groups and residential areas analysed also showed no substantial impact on DR-TB prevalence. These findings suggest that factors beyond sociodemographic variables may influence DR-TB risk, indicating a need for further research into other potential determinants of drug resistance in tuberculosis.

CONCLUSION

This study offers significant new information on the epidemiology of TB and RR-TB for Dadeldhura hospital Nepal. The findings reveal a TB detection rate of 6.7% among presumptive pulmonary TB patients, with an RR-TB positivity rate of 8.6%. The higher TB detection and RR-TB positivity rates among males, as well as the significant variation in TB detection across age groups, highlight the necessity for gender-specific and age-targeted TB control measures. Despite the significant associations between TB detection rates and factors such as gender and locality, no significant associations were found between RR-TB and the sociodemographic factors examined, indicating the complexity of RR-TB transmission dynamics. These results emphasize the urgent need for enhanced diagnostic capabilities, improved surveillance, and tailored interventions to mitigate the spread of TB and RR-TB, particularly in high-risk demographics and localities. To investigate the root causes of these epidemiological trends

and to create efficient plans for the prevention and control of TB and RR-TB, more research is advised.

CONFLICT OF INTEREST

There is no conflict of interest.

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