SOCIO DEMOGRAPHIC PROFILE ASSOCIATED WITH TUBERCULOSIS AMONG THE LOCAL POPULATION OF DISTRICT BAJAUR, KHYBER PAKHTUNKHWA, PAKISTAN

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ABSTRACT

Mycobacterium tuberculosis is a slow-growing facultative intracellular parasite, which is common cause of infectious diseases in developing countries. It is still a major health issue in the rural and urban areas of Pakistan. The current study was conducted to assess the frequency of tuberculosis (TB) with relation to socio-demographic profile of the patients in local population of District Bajaur, Khyber Pakhtoon Khwa, Pakistan. A cross-sectional study was conducted in District Headquarter Hospital (DHQ) Khar Bajaur, Khyber Pakhtunkhwa, Pakistan, from 31st December, 2020 to 23rd June, 2021. A structured and close-ended questionnaire was used to collect data about sociodemographic profile of the patients infected with *Mycobacterium tuberculosis*, at TB control center of DHQ Khar Bajaur and data were analyzed using statistix9 and Microsoft excel. The number of studied patients was 200, out of which (45.5%) were female and (54.5%) were male. The highest number of patients among males (41.5%) were belonged to the age group 31-40 years, while the lowest in male (1.83%) were in age group 61-70 years. The highest number of patients among gender female (32.96%) were fall in age group 21-30 years, while the lowest in female (3.29%) were fall in age group 1-10 years. The distribution of male patients was 18.34%, found in Tehsil Nawagai and lowest were 11.92% in Tehsil Chamarkand. On the other hand, female patients were 24.18%, belonged Tehsil Utman khel and 7.69% belonged to Tehsil Mamund. The most frequent type of TB was pulmonary tuberculosis (110/200), on contrary bone TB was least common among the patients of this geographical areas. Majority of the patients were with low socio-economic status (110/200). It was concluded that Pulmonary TB is the most common disease in the rural communities in Khar Bajaur, and high incidence was recorded in male as compared to female. Socio-economic status is the major cause of tuberculosis among the local population of District Bajaur.

Keywords: *Mycobacterium Tuberculosis*, Tuberculosis, Socio-economic status, Risk Factors, Tehsils.

I. INTRODUCTION

Tuberculosis (TB) is one of the most significant health problems worldwide but Tmore dangerous and dominant disease in the low-income countries. TB is a bacterial disease caused by *Mycobacterium tuberculosis* (MTB), which is an acid-fast, Gram-positive, aerobic, nonmotile, rod-shaped organism (*Saravanan, M. et al., 2018*). It is facultative intracellular parasite, generally invades macrophages (*Duffy, S. C, et al., 2020*). It primarily affects the lungs but can also affect the central nervous system, intestine, bone and joints, lymph glands, skin and other body tissues resulting in extra pulmonary tuberculosis (*Sharma,S.K, et al., 2021*). Mycobacterium tuberculosis complex (MTBC) includes four different types of TB causing bacteria: *Mycobacterium bovis*, *Mycobacterium bovis-BCG*, *Mycobacterium microti* and *Mycobacterium africanum*. MDR-TB is the type of resistant TB in which the organism becomes resistant to first-line anti–TB drugs Like, Rifampicin (RIF) and isoniazid (INH). It became difficult to treat and require more attention and high dosage of drug (*Bansal, R., et al., 2018*).

In Pakistan, 70,000 deaths are attributed annually to the disease with a reporting rate of 331,809 cases, respectively. It is projected that by the year 2025, Pakistan will occupy fourth place in the list with 14.5 million people who experience this disease, if the condition remains the same. In Pakistan, the prevalence of TB is 297 cases per 100,000 population and nearly 0.3 million new cases reported each year (Farooq, U *et al.,* 2020). According to WHO 1.5 million people died from TB in 2020, which is 13th leading cause of death and 2nd after covid-19, about 1.1 million children were infected by TB. 13 billoion USD is needed to fight with TB in 2022 (WHO, 2021) Pakistan adopted directly observed treatments (DOTs) in 1995, whereas TB was declared as national emergency in 2001 (*Saqib, S.E et al., 2018*). Pakistan has fourth position among 27 MDR high burden countries in the world (*Awais, et al., 2018*). According to the National TB Control Program (NTP), 573000 fell ill with TB in 2020, with 46,000 deaths and 93% treatment success (NTP, 2021). Prevalence estimates presented by the World Health Organization (WHO) for Pakistan were based on indirect estimation from notification data, assumptions about duration of TB disease, and expert opinion (*Qadeer, E., et al., 2016*). The data so far in the region of Khyber Paktunkhwa (KPK) and northern areas of Pakistan are very less conclusive. The positive smear cases for pulmonary T.B. were 557/10,000 in the village of northern area while the KPK prisoner study shows 48% prevalence (*Saqib. S.E et al*., *2018*). The transmission of this contagious disease occurs by air when the infected patient expels droplets containing bacilli by coughing, sneezing and laughing. These tiny drops dry quickly but have the ability to suspend in the air for up to four hours, so some of the droplets (10 microns) enter the pulmonary alveoli of the healthy individual by inhalation that 3 consequently contamination (*Farooq U et al*., 2020). TB risk factors include: alcoholism, diabetes mellitus, silicosis, tobacco smoking, indoor air pollution, malnutrition, young age, recently acquired TB infection, recreational drug use, severe kidney disease, low body weight, organ transplant, head and neck cancer, and genetic susceptibility (the overall importance of genetic risk factors remains undefined) (*Chin, K L et al., 2020*). Diagnosis of active TB is based on chest X-rays, as well as microscopic examination and culture of body fluids. Diagnosis of latent TB relies on the tuberculin skin test (TST) or blood tests (*Long, B et al., 2019*). Prevention of TB involves Vaccines Bacillus Clamette-Guerin (*Li, H et al., 2019*). Public health campaigns which have focused on overcrowding, public spitting, and regular sanitation (*Collins, J.A and Lekhas, 2021*). The present study aimed to determine the distribution of patients based on type of TB, gender, age, Tehsil, socio-economic status, and rate of TB infection among the Local population of District Bajaur, Khyber Paktunkhwa (KPK), Pakistan.

1. METHOD AND MATERIAL

1.1. Study area

Study area lies about at an altitude of 1126 m above sea level and the land mass of district lied between 34°-30° and 34°-58° north latitudes and 71°-11° and 71°-58° east longitude. It is a district in Malakand Division of Khyber Pakhtunkhwa province in Pakistan.

The Area of District Bajaur is about 1,290 Sq KM and its Population is about 1287960, according to 2023 census. It has Seven Tehsils and the Number of Village Councils is 120 while Number of Neighborhood Councils 7. To its west lies the Kunar Valley from which it is separated by a series of rugged Hindukush hills and intermittent mountain passes; Nawa Pass, Ghakhi Pass and Leti Sar being the notable ones. Across these hills, the old road from Kabul to Pakistan via Nawa Pass ran before the Khyber Pass was adopted as the main route. To the south of Bajaur lies another tribal district, Mohmand Agency. To the east, beyond the Panjkora river, are the hills of Malakand overlooking Batkhela and Dargai. To the north is an intervening watershed between Bajaur and Dir. It is over this watershed and through the valley of Dir that the G.T road from Mardan via Malakand runs to Chitral.
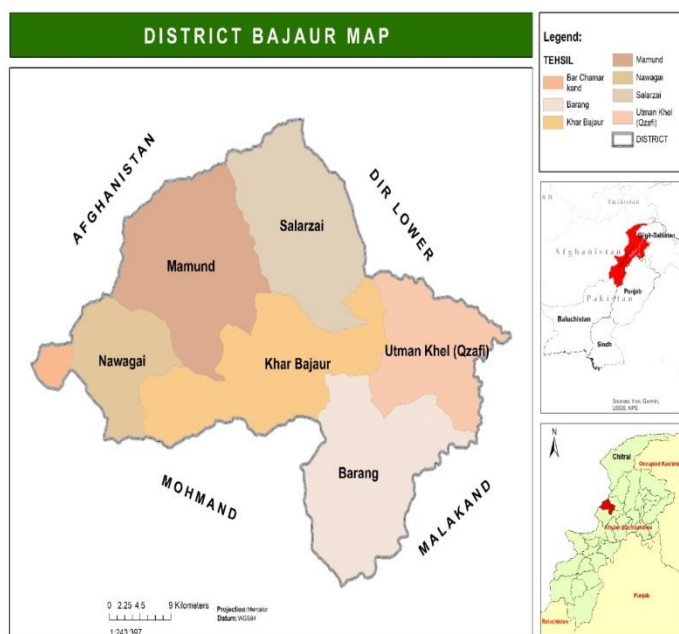
Fig.1 Map of Bajaur ; (Arif, M *et al*, 2022)
A detailed study was conducted in the DHQ hospital Khar district Bajaur, Khyber Pakhtunkhwa (KPK), Pakistan from 31st Dec 2020 to June 23, 2021.

1.2. Data Collection criteria

Patients who were diagnosed cases of tuberculosis by physicians and taking anti-TB treatment are included in this study. Tuberculosis patients associated with other medical problems are also included. Patients who were unwilling to participate and not meeting the above inclusion criteria were excluded. Children under 18 years were enrolled into the study after assent from legal guardian.

1.3. Ethical Approval and Informed Consent

Patients who were agreed to participate in the study were explained the aims and objectives lying behind the study and their informed consent were formally obtained. Patients who were underage, informed consent was obtained from their parents/guardians.

1.4. The Questionnaire and data analysis

We used a structured and closed-ended questionnaire for collecting data from the study population. Questionnaire was based on extensive literature review of similar studies. The questionnaire contained a series of questions related to

patients' socio cultural status, type of tuberculosis (pulmonary or extrapulmonary), family history of tuberculosis, smoking and specific symptoms of their tuberculosis disease and presence or absence of MDR-T.B. Questionnaires were filled up for each patient through face to face interviews. The data was summarized using descriptive statistics, statistix9 software and Microsoft Excel.

2. RESULT

A total of 200 patients were investigated out of which (54.5%) were male and (45.5%) were female. Collectively, the highest number of patients was reported from age group 31-40 (63/200), where the highest frequency of disease was found in males of age range 31-40 years (41.28%), and in females it was reported in age group 21-30 years (32.96%). The frequency of disease was lowest in age group 61-70 among male (1.83%), and in age group 1-10 years among female (3.29%). The details are shown in fig.2
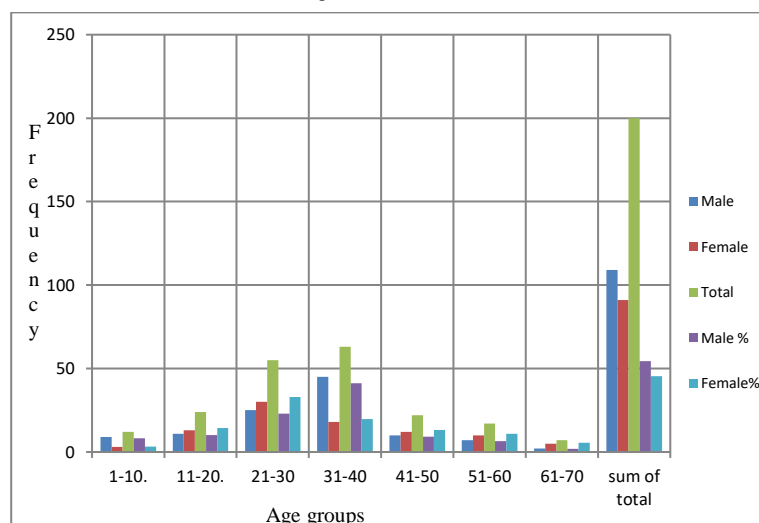
Fig.3.1. Age and gender-wise distribution of patients of tuberculosis.

3.2. Areas wise distribution of patients.

About 200 patients were investigated in 7 Tehsils of district Bajaur (Barang, Chamarkand, Khar, Mamund, Nawagai, Salarzai, and Utmankhel). The number of male patients was 109. The highest infection rate was found in Tehsil Nawagai, that was 20 (18.34%) and lowest in Tehsil Chmarkand was 13(11.92%).
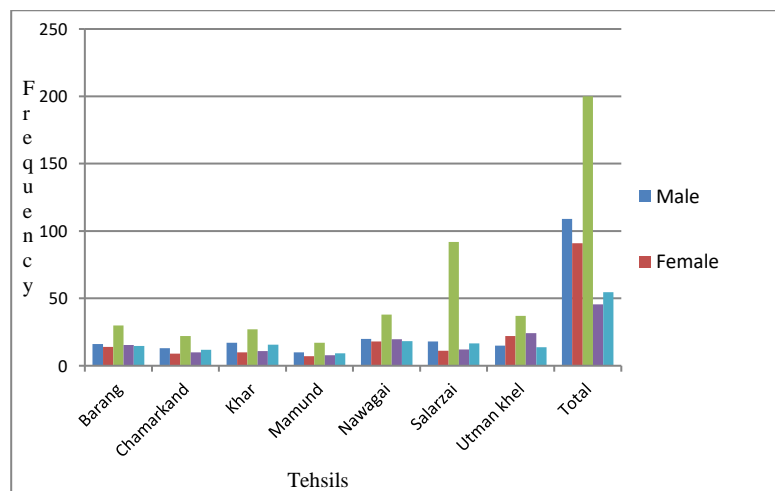
Fig.3 : Tehsil wise distribution of patients

Total 91 Female patients were investigated in 7 Tehsils (Barang, Chamarkand, Khar, Mamund, Nawagai, Salarzai, and Utmankhel). The highest infection rate was found in Tehsil Utmankhel (24.17%) and lowest in Tehsil Mamund (7.69%).

3.3. Types of T.B and distribution of patients

The investigation about type of TB revealed that, the most common form of TB was pulmonary (110/200). The lowest form of TB was of the bone (6/200).
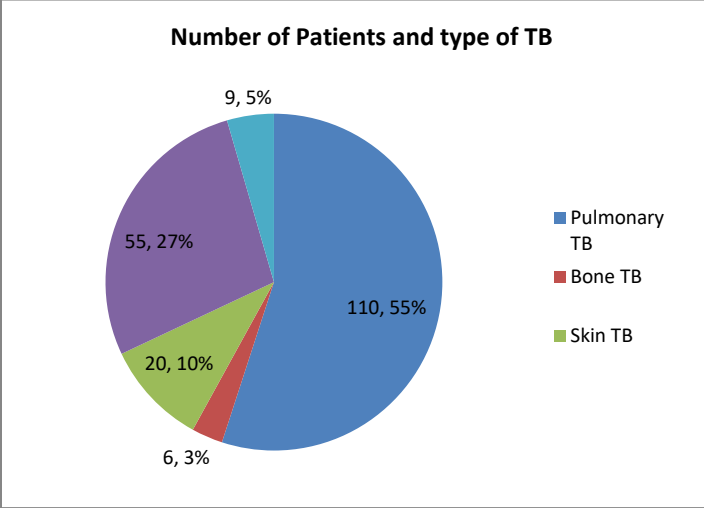

Fig.4 : Distribution of numbers of Patients on the basis of types of TB.

3.4. Socio-economic status of the patients

Socio-economic status of the patients was investigated, which revealed that 110/200 was of low socio-economic status, 71/200 were with middle and 19/200 were with high socio-economic status. The low socio-economic status is directly related with TB because it leads to poor hygiene and crowded homes and public transport system.
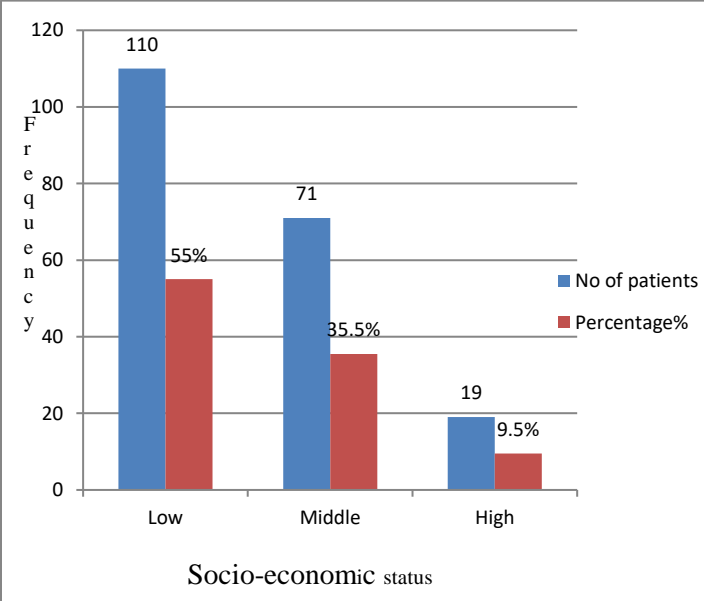

Fig.5. Distribution of Patients on the basis of Socio-economic status.

3.5.   Ratio of immigrated and smoker patients.

The data of 200 patients of TB ratified that the non-smoker were more as compared to the smokers and the local patients were in higher frequency as compared to the immigrants.
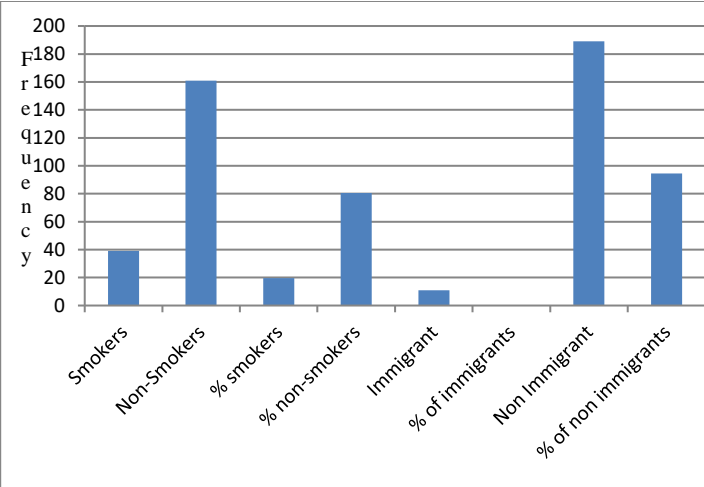

Fig.6: Distribution of TB in smoker, non-smoker, immigrants and non-immigrants

3.6.   Living status and chronic disease history among the patients.

According to our collected data a significant number of patients were lived in the over-crowded areas (143/200), while the number of patients lived in open areas were lower comparatively (37/200) as shown in the table 1.

Table.1: Distribution of patients on the basis of living

Living status	No. Of patients	Percentage %
Crowded areas	143	71.5
Open areas	57	28.5

Table.2. Distribution of TB affected patients on the basis of pervious chronic disease.

previous chronic disease	number of patient	Percentage
Blood pressure	41	20.5
Diabetes	22	11
Heart diseases	12	6
AIDS	3	1.5
Kidney disease	11	5.5
Arthritis	9	4.5
Cancer	10	5
None	92	41

The patients were also investigated for history of the chronic diseases. Nine patients were diabetics, 3 patients were found with history of HIV/AIDS.

3.7.   Occupation and qualification of the patients.

The data of their occupation and educational qualification were collected from the patients. According to the data, the labors which are considered as poor class were frequently affected (48/200). Moreover   the other occupational groups include farmer (24/200), house hold worker (45/200), teachers (5/200), doctors (2/200), shops and small business holders (49/200). The educated people were less affected as compared to illiterate. The details are in fig.7
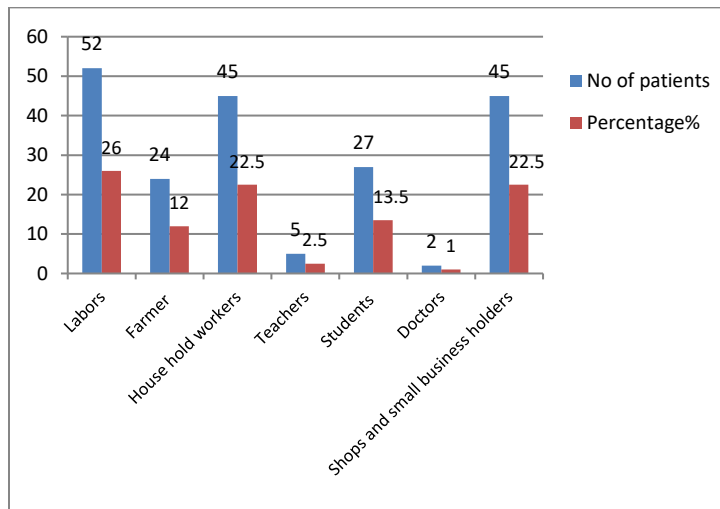

Fig.7: Distribution of TB patients among the local population of district Bajaur on the basis of occupation.
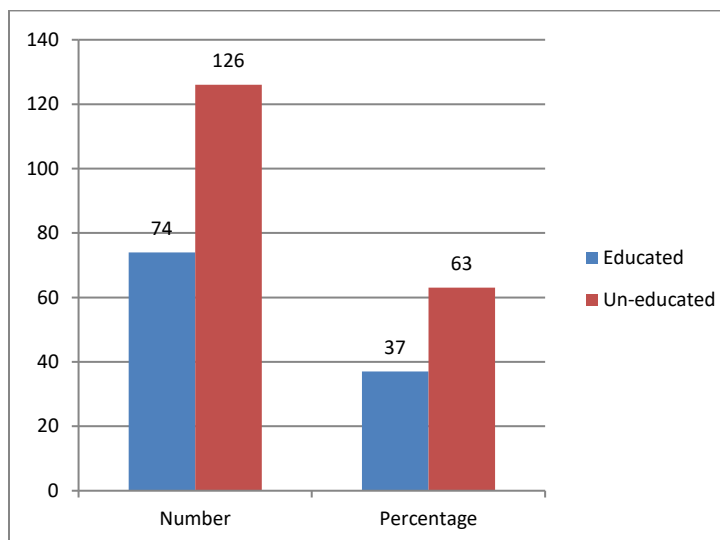

Fig.8: Distribution of TB among the local population of Bajaur on the basis of their educational.

CONCLUSION

Tuberculosis is a serious contagious disease caused by Mycobacterium species. It is epidemic in different countries and a huge population is at risk of TB globally. Current study was conducted to investigate different socio-demographic factors associated with tuberculosis in tribal district Bajaur, Pakistan. The results of the study conducted showed that tuberculosis is still a prevalent disease in the locals of Bajaur, Pakistan. The ratio of tuberculosis was slightly more in male than female because, the female of this geographical area often live in their houses and less often travel or exposed to the crowded areas. There are multiple factors that supplemented the ratio of TB in the local population, like, socio-economic status, poor hygiene, crowded public transport and offices, lack of awareness and education, overpopulation, poverty and prevalent chronic diseases. Low socio-economic status and lack of awareness are the major elements that are responsible for spread of TB in the local community of Bajaur, Pakistan.

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