Research Article

Demographic Characteristics of Tuberculosis Patients at Public Sector Health Facilities in Lahore, Pakistan

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Abstract | Tuberculosis (TB) is an infectious chronic bacterial disease caused by *Mycobacterium tuberculosis (MTB)*. More than 95% of cases and deaths are reported in developing countries. Tuberculosis affects all age groups but adults are mostly affected in their most productive age. However, all age groups are at risks. In the world, TB is one of the major killer infectious diseases, which place it in one of the top 5 causes of death for females aged 15 to 44. The death rate due to this isease has declined by 47% from 1990 to 2015.

Objective: This study was conducted to determine the demographic parameters of patients of Tuberculosis at public sector health facilities Lahore, Pakistan.

Methods: A cross sectional study was conducted in outpatient Department of chest Medicine in Public sector health facilities Lahore, Pakistan from 1st January 2017 to 30th June 2017 after informed consent from Tuberculosis patients. After simple random sampling 1120 patients coming from different parts of the Punjab province were included in this study. Data were collected and analyzed by SPSS version 22.

Results: A total of 1120 patients were included in this study; the mean age of cases was 33 ± 16.76 years with minimum and maximum age of 15 and 100 years. The median and mode of ages was 27 and 15 years, respectively. The most common age group was 15-24 years that comprised of 473(42.23%) of the cases. A total of 529(47.23%) patients were male and 591(52.77%) were female in this study. In male and female cases, frequency of cases was decreased as age increased. Both male and female cases had almost similar distribution of age. There were 830(74.11%) cases those belonged to Lahore while 25.895% were from other cities. Approximately 48.96% males and 38.92% females were educated, 37.24% males and 52.79% females had monthly income 10,000 or less whereas 34.82% males and 25.04% females had monthly income between ten thousands and thirty thousands.38.75% males and 44.84% females belonged to lower class.1004 (89.64%) cases were relapsed and 116(10.36%) were new cases. 366(32.68%) cases had pulmonary tuberculosis (PTB) and 754(67.32%) cases had extra pulmonary tuberculosis.

Conclusion: There were 830(74.11%) cases that belonged to Lahore while 25.895 were from other cities. Majority of the cases were relapsed after treatment. The extra pulmonary lymph node was the most frequent site for involvement.

Links
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Introduction

Tuberculosis (TB) is an infectious chronic bacterial disease which is caused by *Mycobacterium tuberculosis* (MTB).[1] According to World Health Organization, tuberculosis can be classified as pulmonary tuberculosis (PTB) and extra-pulmonary tuberculosis (EPTB) involving organs other than the lungs. Tuberculosis is an airborne disease and persons with pulmonary Tuberculosis sneeze, spit, or cough; the tuberculosis germs are propelled in the air. To become infected, a person needs only a few of bacteria.[2] Adults in the most productive years are mostly affected by Tuberculosis. However, the risk is for all age groups. More than 95% cases and deaths belong to developing countries. Tuberculosis affects all age groups but adults are mostly affected in their most productive age. However, all age groups are at risks. Any part of the body is infected by Tuberculosis but lungs are commonly infected (pulmonary Tuberculosis).[3] when it affects other parts of the body that is called extra Pulmonary Tuberculosis. Pulmonary and Extra Pulmonary Tuberculosis may co-exist. Signs and symptoms in general include fever with rigors, loss of appetite, night sweats, fatigue and nail nclubbing.[4]

In the world, Tuberculosis (TB) is a major killer in infectious diseases 9.6 million people became diseased due to Tuberculosis with 1.5 million deaths in 2014. Approximately 95% of TB deaths occur in underdeveloped countries, and one of the top 5 causes of death for females with age group 15 to 44. In 2014, Due to Tuberculosis one million children became ill with 140 000 deaths. In 2015, Tuberculosis was a leading killer of Human immune deficiency virus/Auto immune deficiency syndrome (HIV/AIDS) positive people with the ratio of 1 in 3 HIV deaths. Globally, an estimated 480 000 people developed multidrug-resistant Tuberculosis (MDR-TB) in 2014 in the world. The target of halting and reversing the Tuberculosis epidemic of Millennium Development Goals has been met globally by 2015. The incidence of Tuberculosis has fallen with an average of 1.5% per year since 2015 and is 18% lower than the level of 2000. The death rate due to this disease has declined 47% from 1990 to 2015. Ther is saving of more than 43 million lives through proper diagnosis and treatment of Tuberculosis from 2000 to 2014. The target of the newly adopted Sustainable Development Goals is ending the Tuberculosis epidemic by 2030.[9]

Methods

Cross sectional study was conducted in outpatient Department of Chest Medicine Public sector health facilities Lahore from 1st January 2017 to 30th June 2017 after taking informed consent from Tuberculosis patients of both sexes of age more than 18 years. After simple random sampling 1120 patients coming from different parts of whole Punjab were included in this study. Data were collected on a specified questionnaire by a doctor and required information regarding the disease was recorded after interviewing the patients. The data were entered and interpreted as frequency and percentage distribution. The data were analyzed by SPSS version 22.

Results

The mean age of cases was 33 ± 16.76 years with minimum and maximum age of 15 and 100 years. The median and mode of ages was 27 and 15 years. There were 25% of the cases whose age was ≤ 20 years and 50% of the patients had age ≤ 27 years and 75% of the cases had age ≤ 45 years. The most common age group was 15-24 years that comprised of 473(42.23%) of the cases, there were 228(20.36%) with age 25-34 years, 138(12.32%) were 35-44 years old, 117(10.45%) cases were 45-54 years old, 84(7.5%) of the cases were 55-64 years of age and 80(7.14%) of the cases were aged ≥ 65 years. Among 1120 patients, 529(47.23%) patients were males and 591(52.77%) were female cases in this study. The female to male ratio was higher in this study

There was decreasing trending of the disease with aging. In male and female, frequency of cases was decreased as age increased. There was slight positive skewedness as there were few cases (7.6%) above 60 years of age. On applying One-Sample Kolmogorov-Smirnov Test (Z test) it was found that age distribution was not normal, Z = 5.3 p-value < 0.001. Both male and female cases had almost similar distribution of age. As data was not normal so we applied Mann – Whitney U test to compare their median ± IQR i.e. the median age of male was higher than female, 30 ± 27 years and 26 ± 21years, p-value = 0.001. There were 830(74.11%) cases that belonged to Lahore while 25.895 were from other cities. There were 68.05% males and 53.47% female's belonged to urban areas of Lahore and other cities whereas 31.95% males and 36.37% females belonged to rural areas of

different cities of the Punjab. The ratio between rural and urban was 2:1. Total of 28.36% males and 32.66% females were illiterate whereas 22.65% males and 28.43% females were only literate. Approximately 48.96% males and 38.92% females were educated in this study. It was also observed those 37.24% males and 52.79% females had monthly income 10,000 or less whereas 34.82% males and 25.04% females had monthly income between ten thousands and thirty thousands. Approximately 27.98% males and 22.17% females had monthly income from thirty one thousands to one lac or more. Majority of participants had monthly income less than thirty thousand which was showing low income status. 38.75%) males and 44.84% females belonged to lower class whereas 34.22% males and 36.04% females were from lower middle class and 27-03% males and 19.12% females belonged to middle, upper middle and upper class. It was concluded that majority of males and females belonged to lower and lower middle class.

decreasing as age increase. In male and female cases no. of cases are decreasing as age increase.
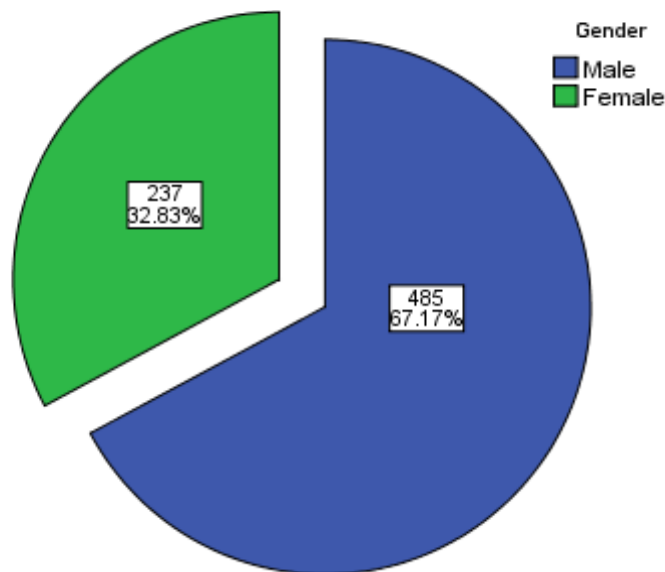

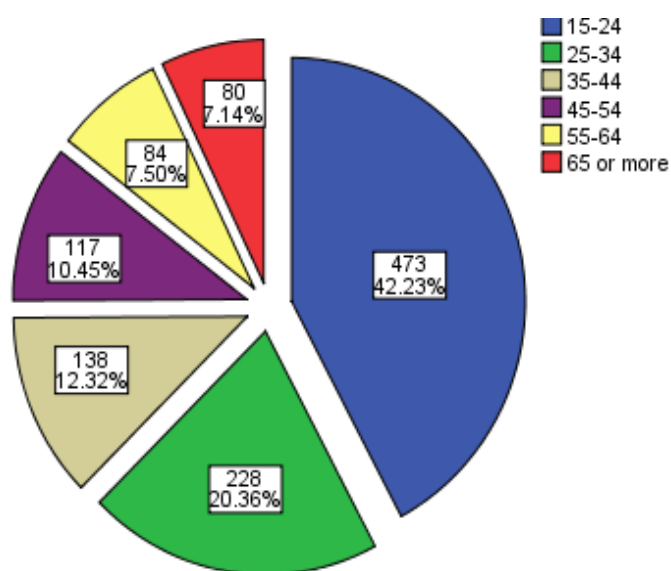**Figure 2**: *Gender wise classification of patients.*

Figure 1: *Age groups of patients.*

According to Figure 1 there were 473 (42.23%) patients were between 15-24 age group, 228 (20.36%) patients belonged to 25-34 age group, 138 (12.32%) patients belonged to 35-44 age group, 117 (10.45%) patients belonged to 45-54 age group, 84 (7.50%) patients belonged to 55-64 age group and 80 (7.14%) patients belonged to 65 or more age group.

According to Figure 2 there were 485 (67.17%) males and 237 (32.83%) females in this study.

In male and female cases no. of cases are decreasing as age increase. In male and female cases no. of cases are
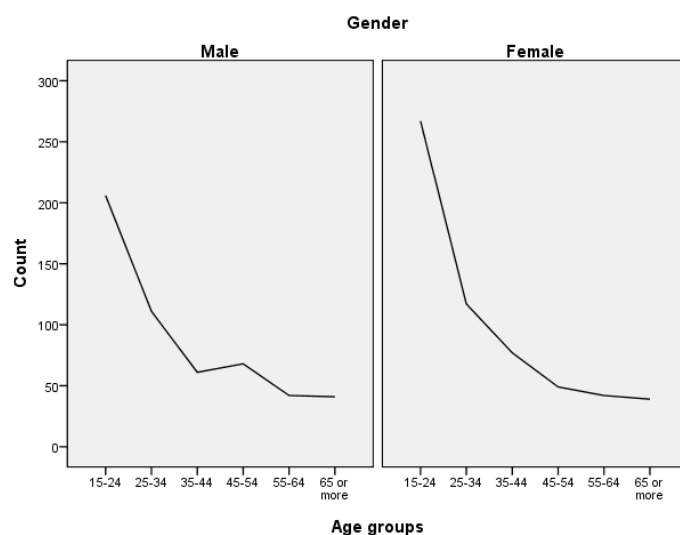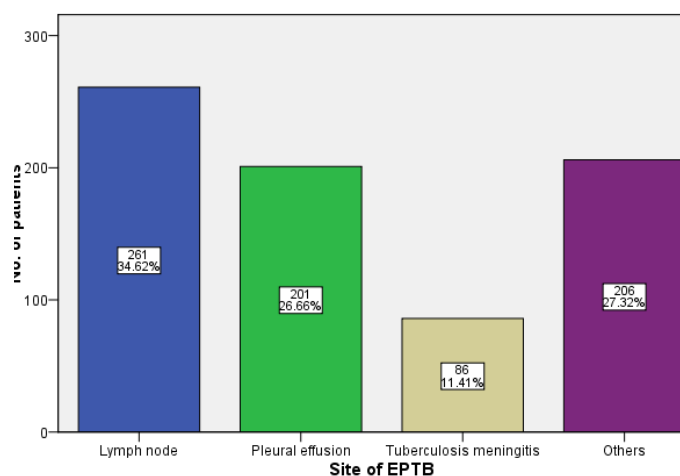

Figure 3: *Gender wise age groups*

Figure 4: *EPTB distribution among groups.*

Graph showing that in male and female cases number of cases are decreasing as age increases.

According to Figure 3 and 4, among Extra PTB cases 261(34.62%) involved lymph node, 201(26.66%) had pleural effusion, TBM was seen in 86(11.41%) of the cases and 206(27.32%) cases involved other sites of the body.

Table 1 showing that 150 (28.36%) males and 193 (32.66%) females were illiterate whereas 120 (22.65%) males and 168 (28.43%) females were only literate. Approximately 259 (48.96%) males and 230 (38.92%) females were educated (Qualification was from Matric to M.A) in this study.

Table 2 showing 197 (37.24%) males and 312 (52.79%) females had monthly income 10,000 or less whereas 183 (34.82%) males and 148 (25.04%) females had monthly income between ten thousand and thirty thousands. Approximately 148 (27.98%) males and 131 (22.17%) females had monthly income from thirty one thousands to one lac or more. Majority of participants had monthly income less than thirty thousand which was showing low income status.

Table 1: *Edication level of the pateints.*

Serial number	Educational status	Number of males	Percentage	Number of females	Percentage
1	Llliterate	150	28.36	193	32.66
2	Literate	120	22.65	168	28.43
3	Matric	102	19.23	130	22.00
4	F.A / F.Sc	68	16.64	53	08.99
5	B.A	57	10.71	35	05.92
6	M.A	32	06.05	12	02.03
		529		591	

Table 2: *Monthly income of the pateints.*

Serial no	Monthly income in Rupees.	Number of males	Percentage	Number of females	Percentage
1	10,000	197	37.24	312	52.79
2	10,000 to 30,000	183	34.82	148	25.04
3	31,000 to 70,000	81	15.31	87	14.72
4	71,000 to 100,000	49	9.76	36	06.09
5	More than 100,000	18	3.40	08	1.35
Total		529		591	

Discussion

In most countries, males are more common as compared to females among tuberculosis patients. Owing to the fact the difference is partly that women have less access to diagnostic facilities as compared to males, but the real epidemiological differences between both sexes is that men and women are exposed to infection and susceptibility to disease[10].

In almost all age groups the male/female ratio was >1 except less than 15 and more than 65. In 2007, the male/female ratio was 2.4 for those patients who were referred. With the increase of age for susceptible strains, the male/female ratio was increased and maximum limit was from 25 to 65 years. In exten-sively drug resistant tuberculosis (XDR-TB) for all age groups the male/female was the highest[11]. In one study, it is reported that in case of *Tuberculosis,* maximum subjects belong to age group of more than 60 years (31.5%) while minimum subjects belong to age group 18-29 years (12.7%). The age group more than 60 years indicates that immunity decreases with advancement of age. Sputum positivity was highest (39%) in age group 20-40 years, 37.6% in 40-60 years age group and 34.5% in more than 60 years in index study. In another study "Underlying risk factors in *Tuberculosis* patients" at a tertiary hospital at Manipal India, maximum cases (41.5%) were in age group 21-40 years, 38.2% in 41-60 years and 11.6% in age group > 60 years[12]. Contrary to this study, Q.H.Khan reported prevalence rate (63.83/1000) in age group of

60 years and above [13]. Roviglion et al had reported maximum cases in age group > 65 years [14]. One study reported that maximum subjects were male (79%) as compared to females (25.1%). In a study conducted by Artil and Anjali male dominance for *pulmonary Tuberculosis* was found 57.8% males and 42.2% females[15].deepak et al, DOTS center Toni for 2006-08, 66% males and 34% females[16]. In one study conducted at India, 74.3 subjects were Hindus, 16.9% were Muslims. Sputum positive cases were 40% in Hindus, 37.8% in Muslims and 11.0% in Sikhs [17]. Similar observation was shown by N. Shetty et al. who reported high number of cases in Hindus (72%).[18]

The data is particularly troublesome in Pakistan due to high prevalence of Tuberculosis and due to this there is creation of thousands of female cases annually in Pakistan. Despite of prior isolated reports, no systemic attempts had been made in Pakistan to estimate the TB in vulnerable population. In Pakistani society, young women are often economically and socially isolated. In the home women often care for the young, sick and elderly in poor society, so there is creation of the potential for transmission of the mycobacteria. It is also common that Pakistani females delay to get healthcare facility or seek low-quality care as compared to males [19].

In this study for demographic profile of general patients of Tuberculosis, 1120 cases were included, 47.23% patients were male and 52.77% were female cases .The female to male ratio was higher in this study. It had been observed that male; female ratio is almost equal or female number is increasing as compared to males. The reason might be that in previous days females were reluctant to get treatment of different types of Tuberculosis due to social taboos so they were not registered in hospitals. Now due to awareness about the disease and knowing that they are the rich source of contact of this disease, so the tendency to get proper treatment is increased. The mean age of cases was 33 ± 16.76 years with minimum and maximum age of 15 and 100 years. The median and Mode of ages was 27 and 15 years. There were 25% of the cases whose age was ≤ 20 years and 50% of the patients had age ≤ 27 years and 75% of the cases had age ≤ 45 years. The most common age group was 15-24 years that comprised of 42.23% of the total cases, there were 20.36% with age group 25-34 years, 12.32% were 35-44 years old, 10.45% cases were 45-54 years old, 7.5% of the cases were 55-64 years of age

and 7.14% of the cases were aged ≥ 65 years. It was very common that Tuberculosis was disease of children and elderly because they have less immunity or immunity is lessened due to any underlying disease but in this study disease is commonly found in young and middle aged patients specially 15-24 and 25-34 years age groups.

There were 68.05% males and 53.47% female's belonged to urban areas of Lahore and other cities whereas 31.95% males and 36.37% females belonged to rural areas of different cities of the Punjab. The ratio between rural and urban was 2:1. 28.36% males and 32.66% females were illiterate whereas 22.65% males and 28.43% females were only literate. Approximately 48.96% males and 38.92% females were educated in this study. It was also observed those 37.24% males and 52.79% females had monthly income 10,000 or less whereas 34.82% males and 25.04% females had monthly income between ten thousands and thirty thousands. Approximately 27.98% males and 22.17% females had monthly income from thirty one thousands to one lac or more. Majority of participants had monthly income less than thirty thousand which was showing low income status. 38.75%) males and 44.84% females belonged to lower class whereas 34.22% males and 36.04% females were from lower middle class and 27-03% males and 19.12% females belonged to middle, upper middle and upper class. It was concluded that majority of males and females belonged to lower and lower middle class.

Conclusion

Number of female cases was higher than males. Age group 15-34 years was maximally affected by Tuberculosis. Additionally, the disease had decreased frequency with aging. There were only a few cases above 60 years of age. Majority of cases belonged to Lahore or its suburbs. The cases that belonged to rural area, had lower class and low socioeconomic status, Males were more educated. Majority of cases were relapsed. 2/3rd cases were diagnosed as extra pulmonary Tuberculosis. In extra pulmonary lymph nodes involvement was more frequent.

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