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Assess Contributory Factor Of Delayed Diagnosis Of Tuberculosis In Bahawalpur Pakistan

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Abstract

Tuberculosis (TB) is a major challenge to population health in all parts of the world and undiagnosed and delayed cases are particularly dangerous to the health of individuals and populations. In the current literature review, a meta-synthesis of the recent research in Europe, Africa, and Asia has been provided, and the causes of delay in TB diagnosis have been pointed out as multifactorial. General themes that arose in response to evidence seem to be as follows: access to healthcare, socio-cultural stigma, financial challenges, education of healthcare providers, and lack of infrastructural support all come to affect the early detection and treatment of TB. In a study up to 43 percent of TB patients in 12 European cities took more than eight weeks to get a diagnosis, and the issue was higher in populations with low incomes (because of difficulties with money and access to primary care facilities). have also reported the same by misdiagnosis of TB by German general practitioners (47%) particularly in non-endemic areas whereby the presence of minimal formal TB training contributed to diagnostic mistakes.The stigma and fear of social exclusion were also important factors related to the patient. Another factor that influences the care delay caused due to stigma was that 54% of TB patients in Italy delayed care a fact which was also acknowledged who found that 57% of migrants in the 10 European countries experienced delays in diagnosis, exacerbated in case of undocumented migrants.

Keyword: Tuberculosis (TB) diagnosis delay, Healthcare access barriers, Stigma and discrimination, Healthcare provider knowledge, Migrant populations and legal barriers, Traditional medicine use

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Introduction

There are some of the stubborner and most complicated infectious diseases in the world involving tuberculosis (TB). Regardless of numerous medical innovations in diagnostics and interventions in the sphere of health protection, TB still remains a serious threat to healthcare systems, especially in low- and middle-income states and vulnerable populations in developed areas. According to the World Health Organization (WHO), TB has become one of the ten leading causes of deaths all around the world and the leading cause of death by a single infectious agent, including HIV/AIDS in many areas (WHO, 2023). The diagnosis of TB with appropriate and standard delay is the key to a successful control effort towards this disease on a global scale.

The problem of delayed diagnosis of TB is not very simple and, in many cases, may be based on structural, social, cultural, and system-related factors of healthcare. The studies published in the past few years have attempted to examine these dynamic in varying regional and demographic settings thus helping to understand the causative factors of delay in diagnoses and how they affect approaches towards population well-being. This literature review summarizes results of the most important studies performed across Europe, Africa, and Asia and discovers recurrency in themes related to the barriers to access to healthcare, financial barriers, stigma, gaps in the knowledge of healthcare providers, and gaps in healthcare infrastructures that have been observed as the major contributors to delays in the diagnosis of TB.

Relying on a thorough research, van der Werf et al. (2023) reported the impact of the healthcare access on TB diagnosis in 12 European cities in their urban populations. These findings indicated that over 45 percent of tuberculosis patients were delayed beyond eight weeks, and this seemed to work with the low income patients whose proportion was concentrated at 65 percent. The consultancy cost together with transport cost and failure to access the primary health services were the key issues. In addition, the study found that the areas less likely to gain access to the medical institutions had a 35-per-cent probability of softening the diagnosis and thus regarded the level of the healthcare system and access to it as one of the reasons of delayed TB diagnosing or avoidance. These findings reinstate the importance of intervention in underprivileged areas in urban centers where such funds can be put in good use to eradicate diagnostic lapse along with prolonging life.

The need to train and educate the healthcare providers has also been cited as one of the biggest determinants in delay of TB diagnosis. More recently, Mreller et al. (2022) conducted a nationwide survey of 500 general practitioners (GPs) in Germany and discovered that, in over 25 percent of the patients with TB, this began with an incorrect diagnosis of another respiratory infection. This misdiagnosis led into an average of 6.3 Weeks delay in diagnosis. The fact that 62% of cases misdiagnosed occurred in non-endemic areas which have low incidents of TB and only 38% of GPs had had any formal TB training in the last five years was an alarming sign. This unavailability of up to date, disease specific education was linked with 2.4 times increase in the probability of a delay in diagnosis. Nevertheless, after the TB awareness, and training programs had been implemented, the study showed that it increased the accurate TB identification by 31 percent and decreased delays in the diagnosis by 22 percent. Based on these indications, it can be concluded that on a regular basis, professional growth and well-organized academic courses on disease-specific features should be specified as the components of any strategy that is designed to minimize the diagnosis delays in TB care.

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In addition to the barriers experienced in the healthcare system, patient related factors also occupy a central position in delayed TB diagnosis. The article by Rossi et al. (2021) discussed the same problem in Italy, surveying 800 TB patients in five of its major cities. The investigation recorded that 54 percent of patients did not seek immediate medical help within a period of six weeks because they feared to be taken as outcasts by society. This stigma-related delay was further evident even in the case of migrant populations with 61% of foreign-born and 39 percent of native Italian patient populations postponing their visits. The more common fears were of being considered contagious (68%) and fears of losing their jobs or being discriminated (42%). The stigma associated with TB resulted in 29 percent higher timely healthcare seeking behavior in high-risk populations because of a public health campaign to eliminate the stigma said a new study by researchers at the University of Colorado Anschutz Medical Campus, indicating the significance of culturally sensitive and stigma-removing interventions as elements in TB control measures.

Likewise, the paper conferred by Smith et al. (2020) performs a pan-European evaluation of the efficacy of immigration condition and TB diagnostic delays. This study was conducted through the examination of medical records and survey of patients having TB and a sample of 1,200 patients in 10 European countries. The findings revealed that there was 57 percent diagnostic delays greater than eight weeks by migrants as opposed to 29 percent of individuals who were native born. The undocumented migrants suffered especially, as 72% said that they experience impediments to healthcare access on account of the fear of deportation and unavailability of health insurance coverage. A difference in language also played a major role that led to miscommunication in 48 percent of cases and resulted in either misdiagnoses or delayed referrals. The researchers found that healthcare policy change involving the provision of free and anonymous TB screening services might be an effective measure in reducing diagnostic delays based on the observable 34% better result obtained during the pilot program.

It is the appearance of the COVID-19 pandemic that added another burden to the process of controlling TB. According to WHO (2023), the case notifications in TB decreased by 24 percent in 2020 in Europe as compared to that of the previous year 2019 due to deprived healthcare provision, lockdowns, and fear of going to hospital by the citizens in light of the pandemic disease. This reduction in case reporting probably concealed the underlying TB burden and augmented community spread risks, a factor that raised the need to have robust and flexible health systems able to continue in TB diagnostics and treatment services in the event of a public health emergency.

The delays in TB diagnosis are particularly high in the resource-scarce contexts, which is also demonstrated in Africa by Johnson et al. (2022). Findings also observed that incidence of diagnostic delays in the study was 46% and it was primarily found to be a result of non-availability of any diagnostic tools, long distances of travel to the health care centers and little awareness among people regarding the signs and symptoms of TB. The problem was further worsened by the socioeconomic constraint with 60 percent of delayed cases attributed to monetary constraints. There was also gender differences where women took an average of 4.2 weeks longer as compared to men because of social and cultural obstacles that limited their access to healthcare.

The prevalent barrier bothering timely TB diagnosis around the globe is stigma. According to Brown et al. (2023), a fourth of the women with TB had a long journey to diagnosis because they feared being socially isolated and stigmatized. Moreover, economic

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reliance on the male relatives led to a 30 percent rise in healthcare inaccessibility among women. The research noted that 40 percent reduction in detection of TB occurred in high stigma area compared to the ones where people have more awareness and acceptability on TB, thus reiterating the need of stigma-alleviatin mechanisms in enhancing TB results.

Nguyen et al. (2023) estimated that minimal awareness regarding TB was a crucial predictor of late diagnosis in Vietnam as low awareness became more prominent in further diagnoses of individuals, and 60 percent of patients were diagnosed after seeking medical care late, with the average time of 8.4 weeks due to the onset of symptoms. Almost half (45%) of the patients had never heard about the symptoms of TB, and a substantial part of patients at the first stage considered their disease of minor nature. The use of traditional medicine also slowed form diagnosis and treatment, particularly in the countryside. The trends reflect a similar study by Sharma et al. (2022) in India, where the use of traditional healers and homemade treatments led to an average of three months before conventional care after being sick.

Functions of the Study

This paper will attempt to review the major causes of delays in the diagnosis of tuberculosis (TB) in various geographical and socio-economic settings. It is a synthesis of the recent evidence concerning the topics of healthcare access, provider awareness, stigma, and infrastructure shortages and provides evidence-based recommendations that could be used in policy interventions to address early detection of TB and improve their outcomes.

Research Questions

1. What do you consider as the major causes of delayed tuberculosis (TB) diagnosis in various regions?
2. What are the effects of access to healthcare, financial barriers, stigma, and the knowledge of health care providers on the timelines of TB diagnosis?
3. What are the successful strategies/ interventions in curbing TB diagnostic delays around the globe?

Importance of the Study

The research has great relevance to the public health because understanding the concept of diagnostic delay can help the international community curb the spread of TB, one of the major problems that have deepened the burden of tuberculosis. The study helps to understand better disparities in healthcare among vulnerable populations by finding and evaluating causes of such delays. It also provides evidence-based information which can be used by the policymakers, healthcare providers and the public health agencies in formulating specific interventions which are likely to enhance timely diagnosis of TB.

Literature Review

Access To Healthcare And Barriers Of Socio-Economic Factors

Van der Werf et al. (2023) carried out a complex study that examined TB diagnosis in urban areas in the 12 European cities. As a result of the findings, it was established that 43 percent of TB patients had taken more than eight weeks to be diagnosed with cases in 65 percent of the patients being low-income population. The costs of consultation and transport were the major financial barriers as 58 percent of the patients mentioned them as reasons that delayed medical consultations. Moreover, the regions that lacked many healthcare centers were 35 percent more likely to experience delay in diagnosis.

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Knowledge and Diagnostic Practices of the Healthcare Providers

In case of TB, healthcare provider awareness is of essence. In another study focusing on 500 general practitioners (GPs) in Germany, it was established that 47 percent of the GPs made an erroneous diagnosis of a TB condition as other respiratory diseases, with an average of 6.3 weeks of delay in reporting of TB (Muller et al., 2022). This occurred mostly in non-endemic places were TB was not commonly experienced. A history of formal TB training was held by only 38 per cent of GPs in the last five years, which ruled with various degrees of likelihood that the undiagnosed delayed diagnosis by an estimated 2.4 times. Nonetheless, after the implementation of a TB awareness program, the accuracy of the TB identification advanced by 31%, and delays in the diagnosis decreased by 22%, which testifies to the significance of ongoing professional education.

In Bangladesh, Rahman et al. (2023) also highlighted the effects of a small healthcare system and training. Through their study they found out that lack of diagnostic facilities, clogged health care centers, untrained staffs were responsible in delays in diagnosis averaging seven week delays. Approximately 35 percent of the patients had failed referral to TB specialists due to the insufficiency of primary care giving providers in the recognition of the early signs of tuberculosis.

Patients factors and Social Stigma

The likelihood of early diagnosis of TB through stigmatization is also high. Rossi et al. (2021) interviewed 0.8 thousand TB patients in five major cities in Italy and revealed that 54 percent of the interviewees waited over six weeks before seeking health care, claiming they were afraid to be stigmatized. Sixty-eight percent of them were apprehensive of being considered as contagious, whereas 42 percent were afraid of losing their jobs or discrimination. The impact of migrant populations was disproportionate and 61% did not come to medical visits as opposed to 39% of the native Italians. Through awareness campaigns on stigma related to TB, there was an increment of 29% in the timely healthcare-seeking approach.

Brown et al. (2023) could corroborate these results by finding that stigma-related factors caused delays in 35 percent of cases, with high disproportion among women. The study conducted by them shows 42 percent of the female TB patients feared having to be ostracized by delaying their treatment, and 28 percent hid their symptoms in a bid to avoid being discriminated. The lack of dependency mainly due to financial issues among male family members, healthcare inaccessibility was multiplied by 30%, and community stigma made 25% of patients feel discouraged to contact a medical professional early.

Effect of Immigration and Legal Barriers

Smith et al. (2020) performed a Pan-European study of diagnosis of TB in migrant populations. It used 1200 TB patients in 10 countries in Europe and the study found out that 57% of migrants took more than eight weeks to have diagnosis as compared to 29% of those who were born in Europe. Undocumented migrants were even more delayed, and seventy-two percent reported being afraid of being deported and not having any health insurance as a barrier to accessing healthcare. Due to the prevalence of informal treatment by nonphysician services (NGOs, community health centers), diagnosis even took longer. Miscommunication due to language barriers was present in 48 percent of the cases and resulted in delays of referrals or misdiagnosis. In pilot programs, policy changes that provided free and confidential TB screening cut down delays by 34 percent.

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Traditional Medicine Use Cultural Practices

Sharma et al. (2022) performed a research on the diagnosing delays of TB in India, with an emphasis on the tradition of using medicine. It was discovered by the research that in rural settings, a large number of patients started using traditional medicines and herbs as well as spiritual healers and that a three months diagnostic delay was observed on average. This was fuelled by the cultural ideologies upon the efficacy of the traditional medicine and ignorance regarding the seriousness of TB. Patients usually ended up in conventional treatment when they were in an advanced stage leading to an enhancement of cases of disease transmission as well as complications.

Disruptive impact of COVID-19 Pandemic

COVID-19 pandemic caused even more difficulties in managing TB. According to the World Health Organization (2023), Europe experienced a 24% decrease in the notifications of TB cases in 2020, which is explained by the lack of healthcare access as well as lockdowns and fear to go to medical facilities on the part of the population. Its services in diagnostic and treatment were affected by the pandemic, which increased the transmission risks of TB. number of the world Tuberculosis Action Plan for the European Region 20232030 now focuses on breaking these forces by giving individual persons' access to quick diagnostics and developing people-centered models of care.

Methodology

Study Setting

The research study was carried out in Bahawalpur which is a small but a major city found in the southern parts of Punjab, in Pakistan. It is an urban-semi urban setting with a population mix and has a few institutions and health care centre with tuberculosis (TB) diagnostic and treatment center. Bahawalpur still experiences challenges in the arena of health despite its comparative advancement in regards to healthcare facilities to counter these problems. The reason as to why the study site was chosen is that of the availability of TB treatment centers and access to the wide range of patients ready and in different stages of diagnosis and treatments of TB.

Study Design

The design adopted was descriptive cross-sectional study to evaluate the reasons behind the late diagnosing of tuberculosis in patients. The current study was suitable to use this design since it enabled the researchers to collect the data on a sample of TB patients at one particular time and not longitudinally. The cross-sectional studies research design is very helpful in the study of public health to draw patterns, connections and risk factors in certain populations.

With the use of such a design, the study could determine the distribution pattern of the diagnostic delay in TB and its magnitudes, and the risk factors thereof apt without a longitudinal follow-up of the patient histories. It was also cross-sectional and thus the logistical limitations made the data collection process more efficient.

Sample Size

In this study, the sample size was computed based on Cochran sample size formula, which is a popular statistical signature used in calculating the sample size in determining the number of study participants that are necessary in producing dependable and sound results in a survey based research study. It calculated as:

Considering the assumptions and the estimated number of people with delayed diagnosis among the TB patients of the region, a sample size emerged at 93 candidates. This sample

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size was satisfactory in a descriptive study and allowed sufficient statistical measurement in simple inferential analysis with SPSS.

Sampling Technique

This study was done through the use of the convenience sampling method to get the participants. Convenience sampling is a non-probability sampling, also known as convenience stratified sampling where selection of the participants depends on their easy access and feasibility to the researcher. Although this strategy has shortcomings concerning its representation of the general population, it is widely applied to conduct exploratory research in the healthcare sector when the limitations of resources or logistics do not allow random sampling.

In the current study, the convenience sampling allowed the researchers to reach those TB patients in the clinic, diagnostic labs, and hospitals in Bahawalpur, who would agree to participate and fit the inclusion criteria. Although the generalizability limitation seems to apply in this case, the methodology is suitable because TB is a sensitive disease, and the study had a timestamped frame.

Study Population

The population of this study hence were patients diagnosed with tuberculosis at various stages which in this case were, primary, secondary and latent stages of TB. These steps have been established after discussing them with local experts on TB and in line with the WHO classification.

The research was especially interested in specific cases of patients with delayed diagnosis, that is, patients on whom medical confirmation and treatment occurred, months or even weeks after the symptomatic period. The study targeted such people to get insight into the risk factors that led to the delay and its related complications.

Inclusion and Exclusion Criteria

Inclusion and exclusion criteria were set in order to preserve the validity and safety of proposed research to outline what is significant.

Inclusion Criteria

1. Patients, who are under medication with latent or secondary tuberculosis
2. Patients with a delay in diagnosis (usually more than 6 weeks after the beginning of the symptoms).
3. All the adults participated with the consent of adults over 18 years

Exclusion Criteria

1. Those of the patients who had been completely treated of tuberculosis
2. Patients who have an acute or newly diagnosed TB(as they might be yet to show signs of complications resulting out of delay)
3. Patients with more than one comorbidity i.e. diabetes, HIV/AIDS, or chronic lung disease that might complicate the analysis of diagnostic delay

Information Gathering Tool

Structured questionnaire was utilised to collect the data, and this was designed by consulting with public health experts, clinicians, and epidemiologists. Both closed and Likert-scale items were used in the questionnaire and they fell under the following domains:

Demographic Data

1. Medical History
2. Health-Seeking Behavior

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3. Diagnostic The complications incurred, as a result of late diagnosis

Study Variables

The variables were classified as under in this research:

Independent Variables

Risk Factors; These factors affect the situation wherein it involves financial constraints, access to healthcare, stigma, awareness, gender, and mistakes made by providers.

Dependent Variables

1. Delayed Diagnosis Complications like aggravation of the disease, spread of the disease, enhanced infectivities, lengthy treatment process, psychic sufferings, and hospital stay.
2. Through the investigation of the interconnections between these variables, the research attempted to determine how some conditions or behaviors lead to poor TB management.

Ethical Considerations

The element of ethical standards was fundamental in this research. The study protocol was formulated following the ethical guidelines as illustrated by the Declaration of Helsinki and those of the local institutional review. The most critical ethical practices were as follows:

1. Informed Consent and Voluntary Participation: All the participants were aware of the aims of the study, the procedures, the risks, and the benefits involved. Before the collection of data, written or oral consent was given.
2. Confidentiality: The identity of the participants and personal information were kept in secret. There were no names or identifiers, but anonymized codes were provided.
3. Minimization of Harm:No physical, psychological and legal harm caused to participants in the research. Interviewers have been prepared to deal with sensitive answers in a compassionate and impartial way.

Results and Analysis

In this chapter, the authors give the results obtained based on the data on 93 tuberculosis (TB) patients in Bahawalpur, which was collected through a structured questionnaire. The findings are classified into five broad thematic groups i.e. socio-demographic attributes, barriers to knowledge and awareness, cultural and behavioural factors, healthcare system, and financial issues. The statistical analysis of the data was carried out with the help of SPSS and described with the help of descriptive statistics, which were analyzed in the context.

Socio-demographic Profile of Participants

The state of TB diagnosis delays will be put to context by knowing the background of the participants. Age distribution of the subjects revealed that 57.4 percent of them were less than 25 years with the remaining 37.2 percent between 25 and 30 years. A very little percentage of the subjects (2.1 and 2.1) were in these age ranges of 3135 and above 36 years. This dispersion entails the idea that diagnostic delay in TB is more common among the younger category, perhaps because they have no experience with the healthcare world, are financially dependant, or they simply do not prioritize their health over their academic performance, as well as on insurance problems, because there are fewer poor or indigent people among younger individuals.

Gender Analysis showed that 89.4 percent of the respondents are women leaving 8.5 percent who are men. This discrepancy is an indication that there exist gender differences in healthcare access. In most homes in Pakistan, women lack agency to make critical

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decisions, and they have to take the consent or approval of other male members in the family when they need care. This addiction tends to impede the decision to seek healthcare. In addition, the cultural demand of being modest and keeping things discreet might not allow women to talk about the symptoms freely, and this will make it even more difficult to diagnose.

There was no significant difference in the religious background considering that, 92.6 percent were Muslim and 5.3 percent Christian in line with the regional religious demography. Educational attainment however posed a rather interesting temperature shift; 40.4 percent of the respondents had doctoral level degrees (mostly nurses and medical professionals), 29.8 percent were in the undergraduate level, 22.3 percent were matriculated and only 6.4 percent had master's degrees. The finding that the largest proportion of the respondents are formally educated indicates that academic education in general does not amount to health literacy about a specific disease rather than the generic health knowledge.

Household income indicated that a good percentage (59.6) of the participants had low monthly earning of PKR 500 000 annually. The higher percent received between PKR 600000- 900000 (21.3% combined), and a very low number received above PKR 1.2 million. This implies that there could be a close connection between low income and late diagnoses because low-income groups tend to postpone or not use care because of the perceived or actual cost.

Table 1: ***Descriptive Statistics for Demographic Characteristics of Participants***

Variable	*Valid N*	*Missing N*
Age	*93*	*1*
Gender	*93*	*1*
Religion	*92*	*2*
Education	*93*	*1*
Annual Income	*93*	*1*

Note. N = number of participants who responded. Demographic data were self-reported.

Table 2: ***Descriptive Statistics for TB-Related Knowledge, Beliefs, and Behavioral Statements***

Statement	**Valid N**	**Missing N**
I was not aware that a persistent cough >2 weeks could be a sign of TB	93	1
I delayed seeking care because I did not know TB could be serious	93	1
I believed TB only affects specific groups, so I didn't consider it a possibility for myself	93	1
I was unaware that TB treatment is free at government hospitals	93	1
I did not seek help early because I thought TB was not common in my community	93	1
I preferred using home remedies or self-medication before visiting a doctor	93	1
I waited for symptoms to improve naturally before seeking medical attention	93	1
I visited multiple healthcare providers before correct TB diagnosis	93	1

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I initially consulted traditional healers or religious leaders instead of a doctor	93	1
I avoided care because I was afraid of being diagnosed with a serious disease	92	2
I had difficulty accessing a healthcare facility due to long distances	88	6
I delayed care due to long waiting times at hospitals/dispensaries	93	1
I was misdiagnosed by a healthcare provider, which delayed TB diagnosis	93	1
I did not receive proper guidance from healthcare providers about TB symptoms	93	1
TB diagnostic services were limited in my area, causing delays	93	1
I delayed care because I could not afford consultation fees	93	1
Transportation cost to clinic/hospital was a barrier	93	1
Concern about financial burden of long-term TB treatment led to postponement	94	0
I was afraid of being judged by my community if diagnosed	93	1
I hesitated to disclose symptoms to family/friends due to fear of discrimination	93	1

Note. N = number of participants who responded. TB = Tuberculosis.

Informed and Aware-Based Barriers

The answers of the questionnaire showed there was a major deficiency in the knowledge about TB symptoms and community health facilities. In response to the early symptoms, 46.8 percent strongly agreed that they did not know that, prolonged cough of over two weeks could be a sign of TB, whereas 35.1 percent said that they were neutral. Majority of the ignorance of cardinal symptoms of TB, such as this one, presents a significant obstacle towards early detection and diagnosis.

Besides, 59.6 percent agreed overwhelmingly that they had been reluctant to seek care at an early period due to ignorance on TB being a serious disease. One-third even more (33%) had a neutral attitude proving how the level of the TB problem is often misjudged. Such a false belief may result in laxity to obtain early diagnosis and more community transmission.

There were delays caused as well by stereotypical beliefs about TB. More than 56 percent of the respondents shared the idea that TB just hit some social groups and these include the poor and the aged. These stereotypes encourage younger or more educated individuals to have a false sense of immunity and ignore the symptoms thinking that they are unrelated to TB or think they are not that serious.

Perhaps just as worrying was the fact that there was no awareness about TB services provided by the government. 54.3 percent of the participants did not know that one can receive free treatment of TB at the public hospitals. Such ignorance can deny the assistance of financially deprived individuals, who due to ignorance assume that once they know it is a disease and to be treated this way, then money will be a huge factor.

Cultural and Behavioral Factors

The research showed powerful cultural and behavioral forces that had been causing the delays in diagnosis. More than a half of the respondents (51.1) vehemently agreed that they first turned to self-medication or home-based remedies, including the I use of a herbal infusion or investment in over-the-counter syrups. Such dependency on the conventional

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remedies also postpones the institutional care, acting specifically on the professional practices when the symptoms are regarded as limited.

This is closely related to the fact that 51.1 percent also indicated that they used to wait until their symptoms got better before they considered seeking the help of a healthcare practitioner. This is a sort of denial or optimistic evasion which lengthened the move to diagnosis, particularly at initial or symptom free stages of TB.

Patient behaviour was also affected by spiritual beliefs and alternative healing strategies. The percentage of the participants who turned to the religious leaders or the traditional healers who needed to see a doctor reached nearly 51.6 percent. Such cultural beliefs though entrenched in culture might delay the implementation of evidence-based medical care and have an impact on health outcomes.

Factors in the form of psychological reaction to illness became main obstacles. Forty-eight point three percent said they had avoided medical treatment owing to possible diagnosis of a severe condition. This anxiety stays away people to undergo early testing, or visit hospitals because they fear this can brand, stigmatize, or they will end up with a chronic disease.

Patient responses were dominated on stigma. The fear to be judged by fellow members of the community was 51.6% in case one had TB and of this number 52.7% stated they had concealed their signs and symptoms out of fear of being discriminated. This internalized stigma does not only hamper free discussions but also creates the culture of silence about TB which adds to delays in diagnosis.

Age Frequency Table 3:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 25 Years	54	57.4	58.1	58.1
	25-30 years	35	37.2	37.6	95.7
	31-35 years	2	2.1	2.2	97.8
	Above 36 Year	2	2.1	2.2	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

Table 1: Socio-demographic characteristics of participant

Table 1 shows that 57.4% (54) participants were below 25 years, 89.4% (85) participants were female participants, 92.6 %(87) participants were Muslims, 40.4% (38) participants were doctor and 29.8% (28) participants were Bachelors in Nursing, 59.6% (56) participant had annual income less than 500000.

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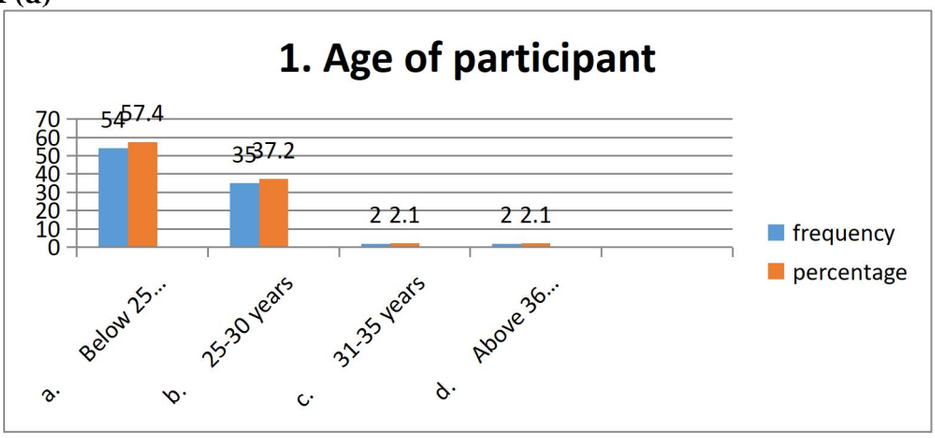
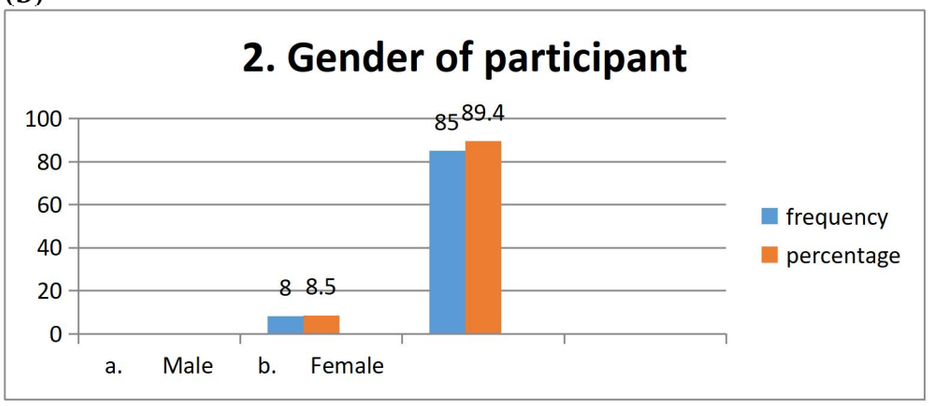
Figure# 1 (a)



Gender Frequency Table 4:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	8	8.5	8.6	8.6
	Female	85	90.4	91.4	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

(b)



Religion Frequency Table 5:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Muslim	87	92.6	94.6	94.6
	Christian	5	5.3	5.4	100.0
	Total	92	97.9	100.0	
Missing	System	2	2.1		
Total		94	100.0		

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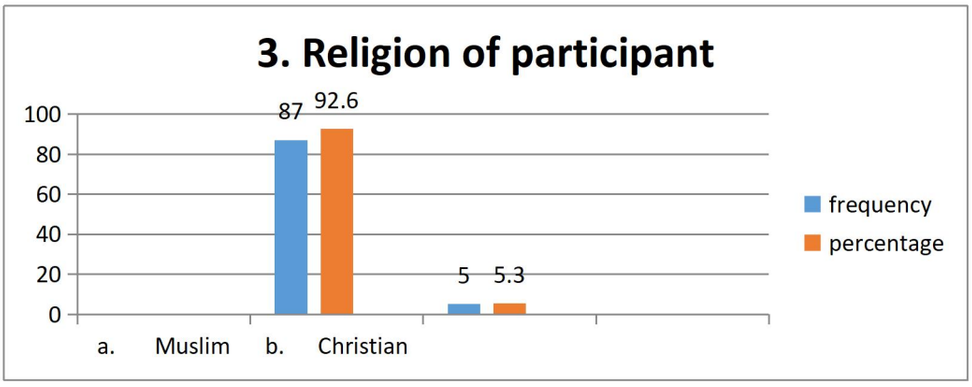

Education Frequency Table 6:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Matric	21	22.3	22.6	22.6
	Graduate	28	29.8	30.1	52.7
	Master's Disgree	6	6.4	6.5	59.1
	Doctor Degree	38	40.4	40.9	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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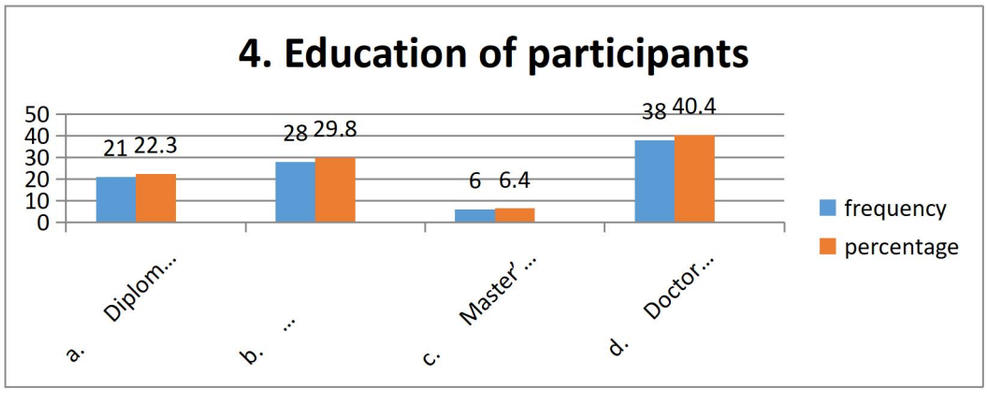

Annual Income Frequency Table 7:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 500000	56	59.6	60.2	60.2
	6lac- 7lac	20	21.3	21.5	81.7
	8 lac- 9lac	8	8.5	8.6	90.3
	10 lac - 11lac	7	7.4	7.5	97.8
	12 lac or above	2	2.1	2.2	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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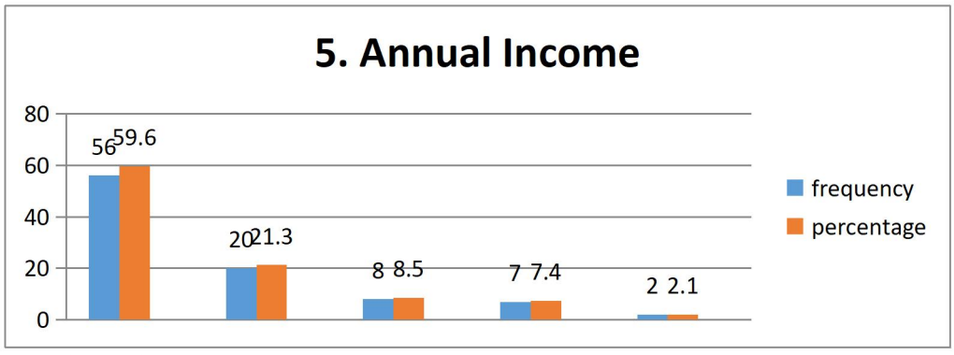

Figure# 1 (a, b, c, d, e)

Above figures shows that 57.4% (54) participants were below 25 years, 89.4% (85) participants were female, 92.6 %(87) participants were Muslims, 40.4% (38) participants were doctor and 29.8% (28) participants were Bachelors in Nursing, 59.6% (56) participant had annual income less than 500000..

Issues of Healthcare System

Delayed TB diagnosis was also caused by major healthcare deficiencies that were systemic in nature. A remarkable share of 73.1 percent of the respondents said that they needed to attend several medical care facilities before they acquired an accurate diagnosis. This realization reveals that most primary care providers do not have specific knowledge on TB, and most of them could probably confuse TB signs and symptoms as other infections or viral diseases.

Fifty point five percent of the subjects had cases of misdiagnosis, and in majority of cases, they were first treated with standard respiratory infections. Without a doubt, these kinds of diagnostic errors do not only remain a waste of valuable time but also lead to the enhancement of chances of the transmission of TB within families and among communities.

Along with the weaknesses of diagnostics, there was a gap in communication between medical workers and patients. There were 57 percent of respondents indicating that they had not had clear or adequate instructions on the condition, the symptoms, or the necessary testing by the healthcare providers. It is a case of either a training gap among the providers or time constraints when they meet with a patient.

The other challenge that persisted related to access to diagnosis services. Almost 48.4 percent of the respondents indicated the absence of diagnostic facilities in their area of residence. Also, 46.2 percent of them reported that they experienced problems accessing hospitals owing to the long distances of their home areas. Such problems are particularly acute in the areas of rural Bahawalpur where there are few health infrastructures and limited modes of transport.

There were frequent mentions of hospital inefficiencies too. The leading responses given by a substantial 47.3 percent of the respondents were waiting a long time in hospitals as some of the barriers to care. In the case of people earning a daily wage or the caregivers, spending a few hours at a facility is not very viable and can put them off consulting in the future as well.

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Table 8: ***I was not aware that a persistent cough for more than two weeks could be a sign of tuberculosis***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	4.3	4.3	4.3
	Disgree	12	12.8	12.9	17.2
	Neutral	33	35.1	35.5	52.7
	Stongly Agree	44	46.8	47.3	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

Fig # 2 (a)

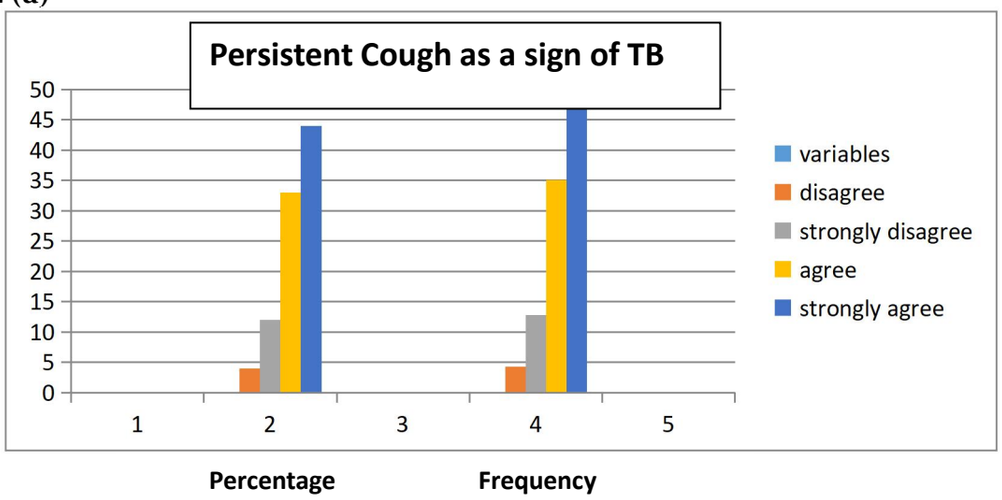

Table 9: ***I delayed seeking medical care because I did not know tuberculosis could be a serious illness***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	3.2	3.2	3.2
	Disgree	3	3.2	3.2	6.5
	Neutral	31	33.0	33.3	39.8
	Stongly Agree	56	59.6	60.2	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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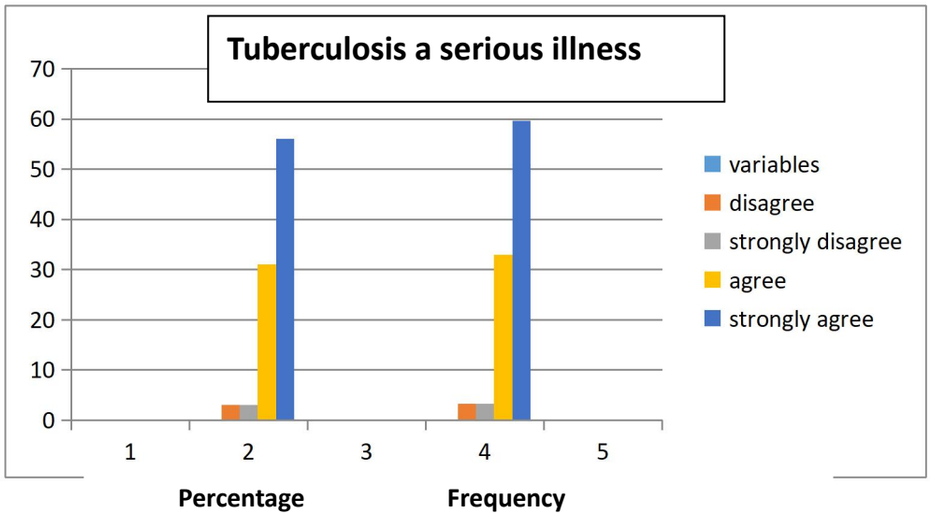

Table 10: I believed TB only affects specific groups of people, so I did not consider it as a possibility for myself

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.1	2.2	2.2
	Disgree	7	7.4	7.5	9.7
	Neutral	31	33.0	33.3	43.0
	Stongly Agree	53	56.4	57.0	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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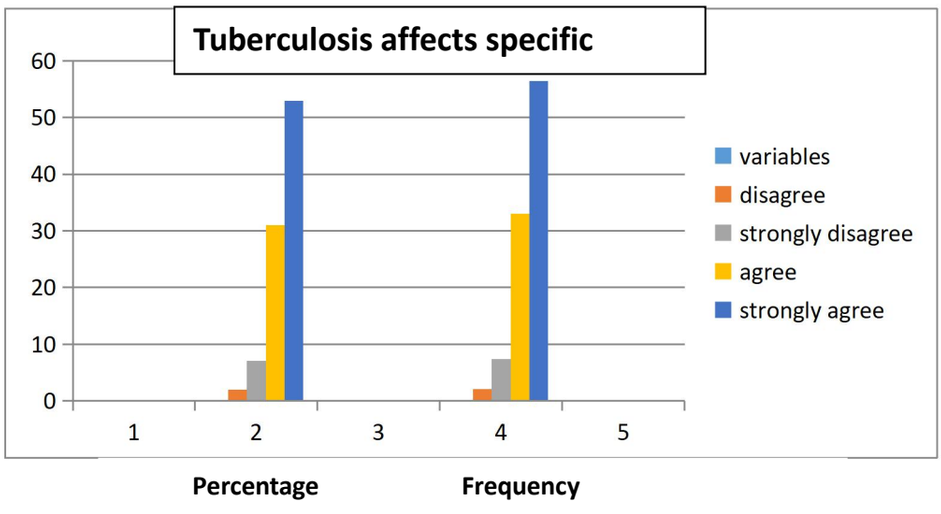

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Table 11: ***I was unaware that TB treatment is free at government hospitals***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.1	1.1	1.1
	Disgree	6	6.4	6.5	7.5
	Neutral	35	37.2	37.6	45.2
	Stongly Agree	51	54.3	54.8	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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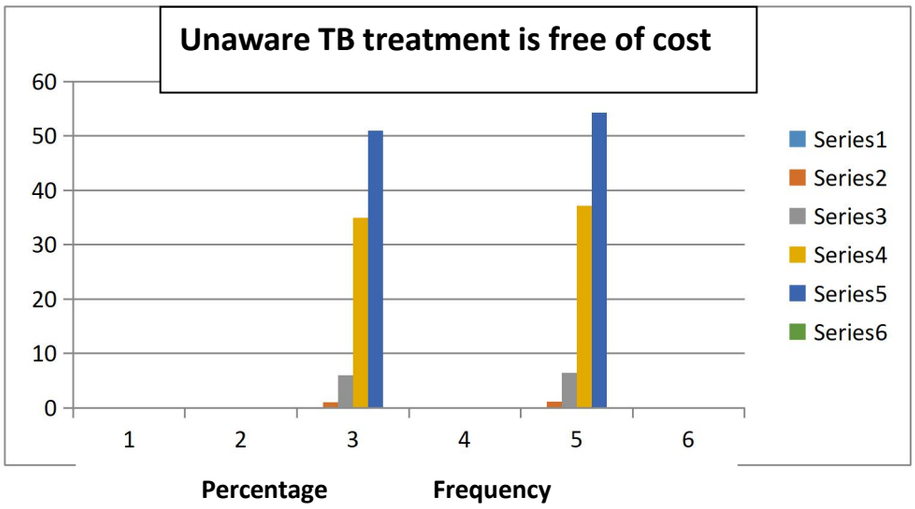

Table 12:

I did not seek medical help early because I thought TB was not common in my community

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.1	1.1	1.1
	Disgree	5	5.3	5.4	6.5
	Neutral	44	46.8	47.3	53.8
	Stongly Agree	43	45.7	46.2	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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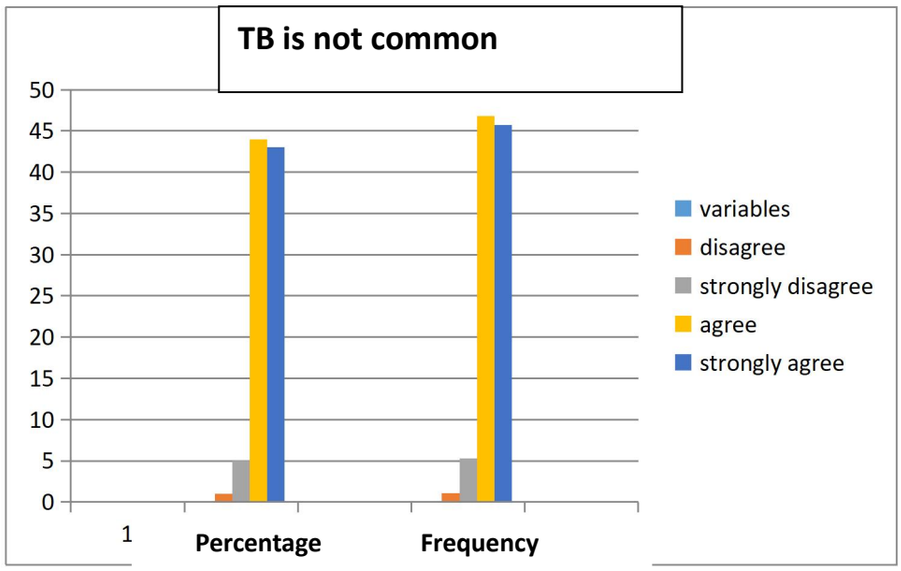

Table 13: ***I preferred using home remedies or self-medication before visiting a doctor***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.1	2.2	2.2
	Disgree	3	3.2	3.2	5.4
	Neutral	40	42.6	43.0	48.4
	Stongly Agree	48	51.1	51.6	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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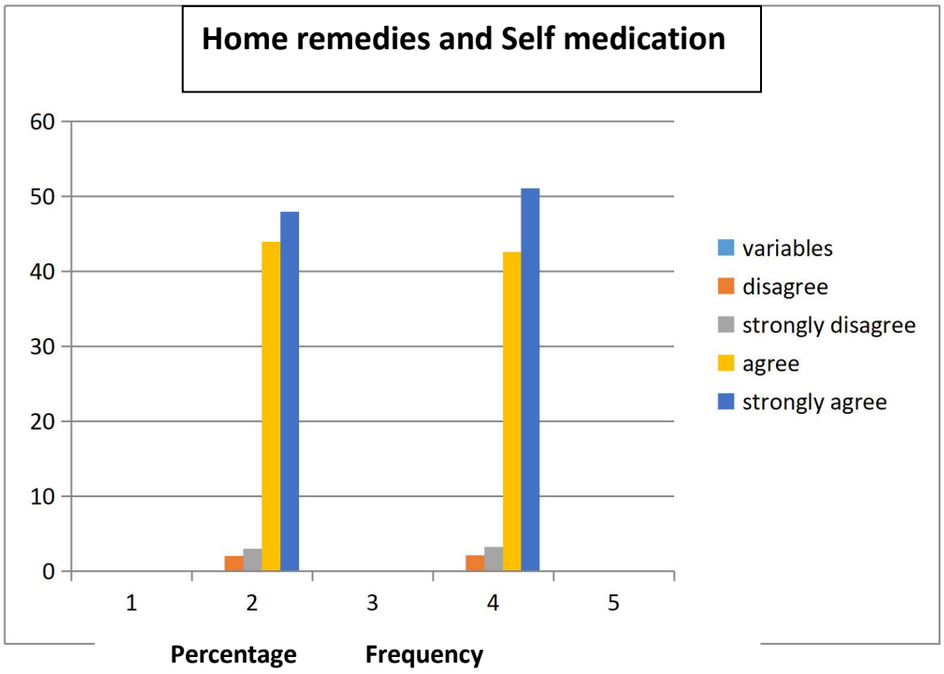

Table 14: ***I waited for my symptoms to improve naturally before seeking medical attention***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	7.4	7.5	7.5
	Disgree	3	3.2	3.2	10.8
	Neutral	35	37.2	37.6	48.4
	Stongly Agree	48	51.1	51.6	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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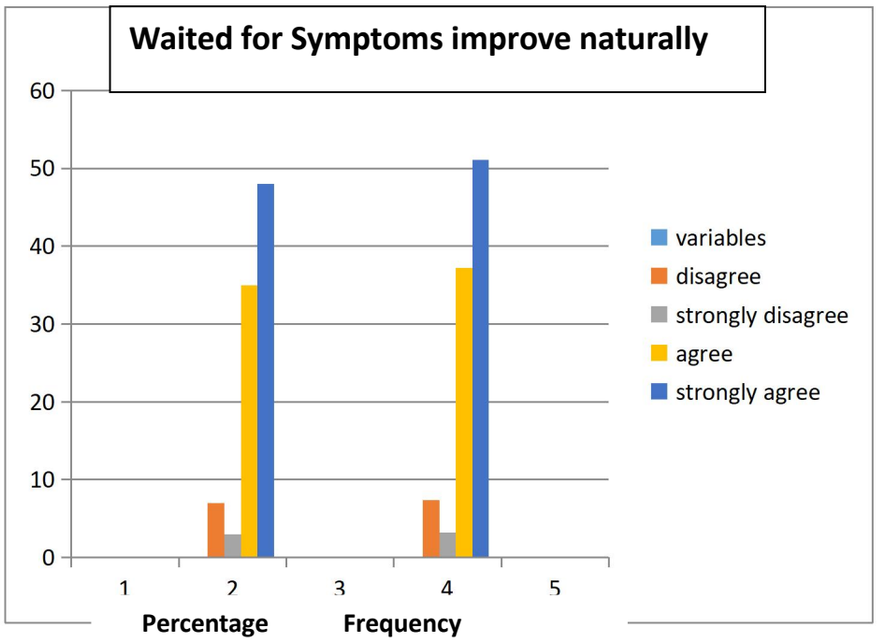

Table 15: ***I visited multiple healthcare providers before being correctly diagnosed with tuberculosis***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	6.4	6.5	6.5
	Disgree	8	8.5	8.6	15.1
	Neutral	11	11.7	11.8	26.9
	Stongly Agree	68	72.3	73.1	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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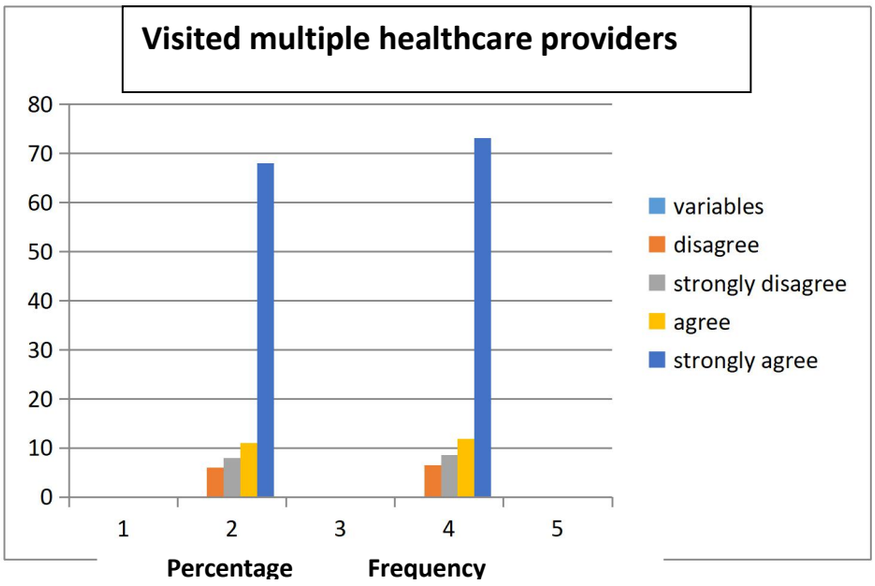

Table 16:
I initially consulted traditional healers or religious leaders instead of a medical doctor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	7.4	7.5	7.5
	Disgree	3	3.2	3.2	10.8
	Neutral	35	37.2	37.6	48.4
	Stongly Agree	48	51.1	51.6	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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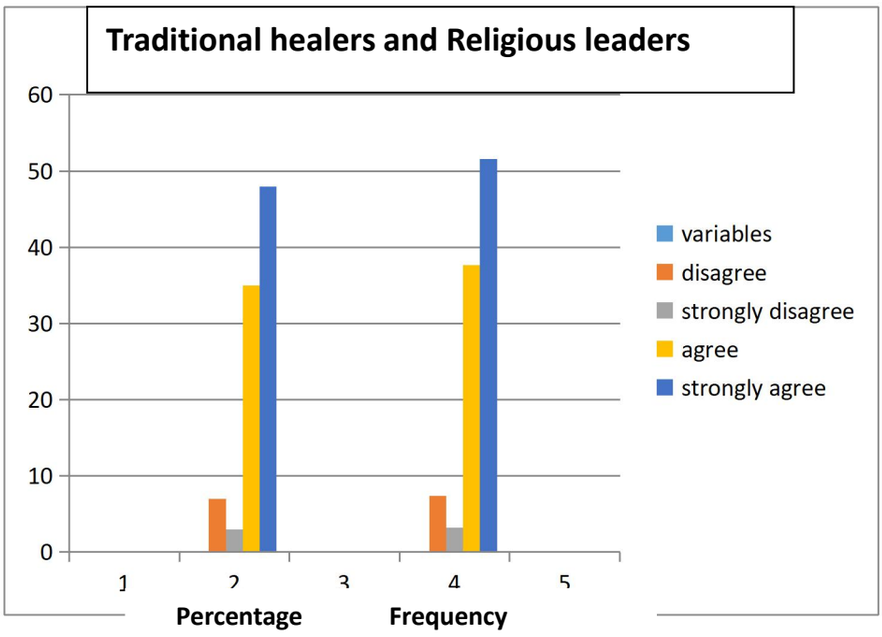

Table 17: ***I did not seek medical help immediately because I was afraid of being diagnosed with a serious disease***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	6.4	6.5	6.5
	Disgree	19	20.2	20.7	27.2
	Neutral	22	23.4	23.9	51.1
	Stongly Agree	45	47.9	48.9	100.0
	Total	92	97.9	100.0	
Missing	System	2	2.1		
Total		94	100.0		

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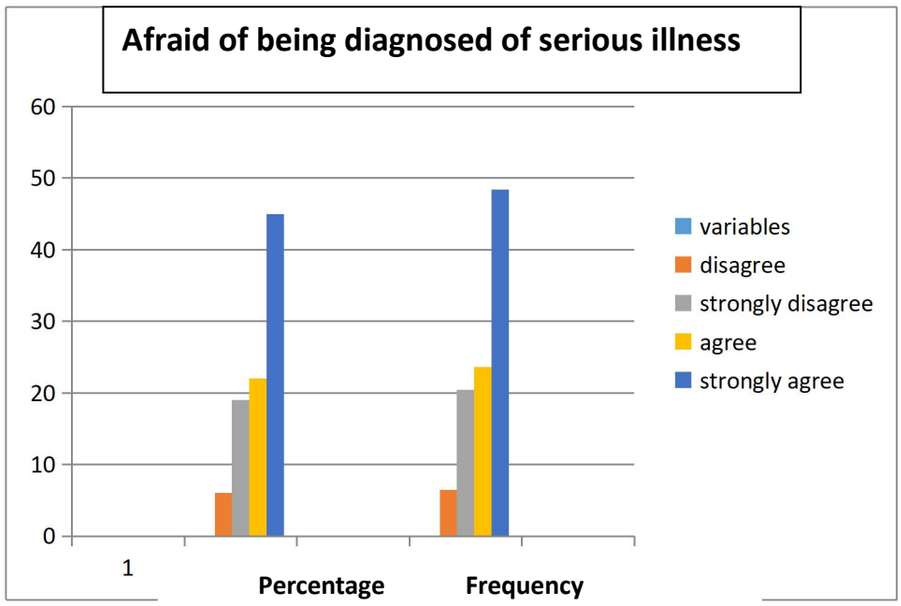

Table 18: ***I had difficulty accessing a healthcare facility due to long distances from my home***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	9.6	10.2	10.2
	Disgree	18	19.1	20.5	30.7
	Neutral	18	19.1	20.5	51.1
	Stongly Agree	43	45.7	48.9	100.0
	Total	88	93.6	100.0	
Missing	System	6	6.4		
Total		94	100.0		

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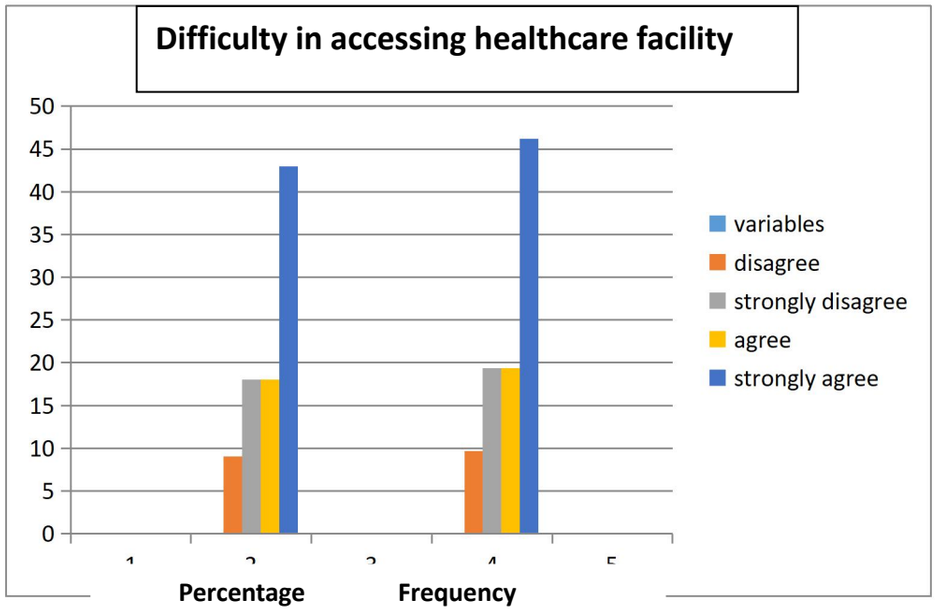

Table 19: ***I delayed seeking medical care because of long waiting times at hospitals and dispensary***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	10	10.6	10.8	10.8
	Disgree	20	21.3	21.5	32.3
	Neutral	19	20.2	20.4	52.7
	Stongly Agree	44	46.8	47.3	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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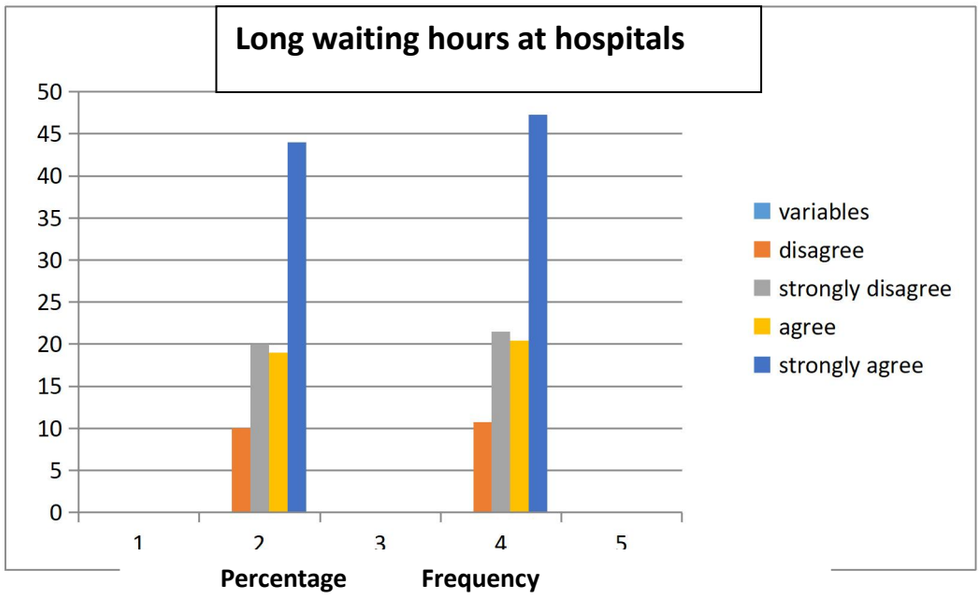

Table 20: ***I was misdiagnosed by a healthcare provider, which delayed my tuberculosis diagnosis***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	8.5	8.6	8.6
	Disgree	14	14.9	15.1	23.7
	Neutral	24	25.5	25.8	49.5
	Stongly Agree	47	50.0	50.5	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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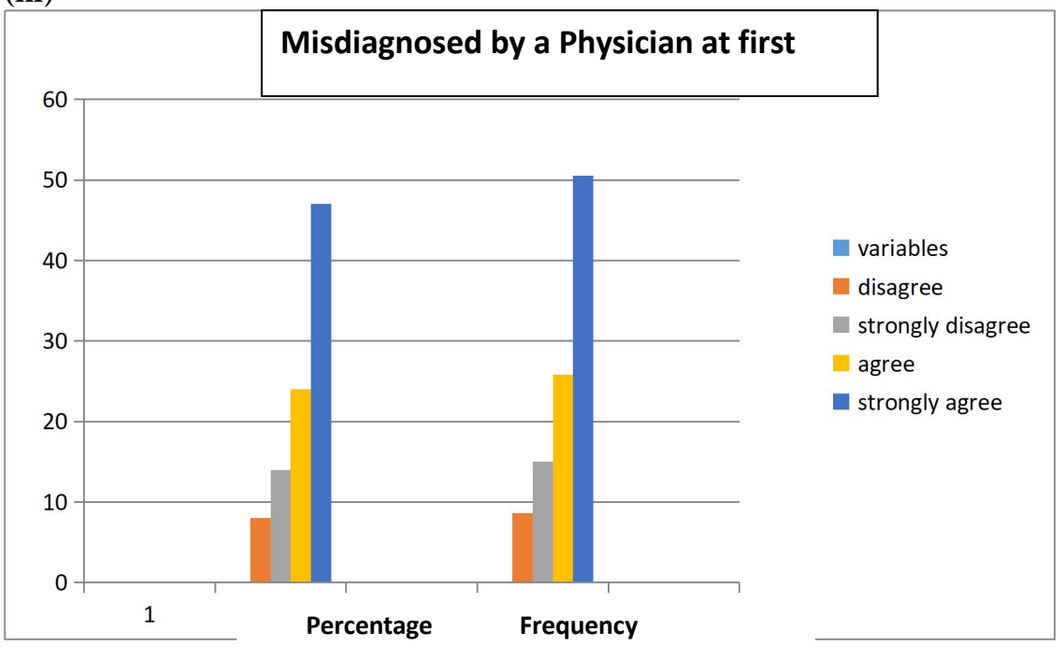

Table 21: ***I did not receive proper guidance from healthcare providers regarding TB symptoms***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	7.4	7.5	7.5
	Disgree	19	20.2	20.4	28.0
	Neutral	14	14.9	15.1	43.0
	Stongly Agree	53	56.4	57.0	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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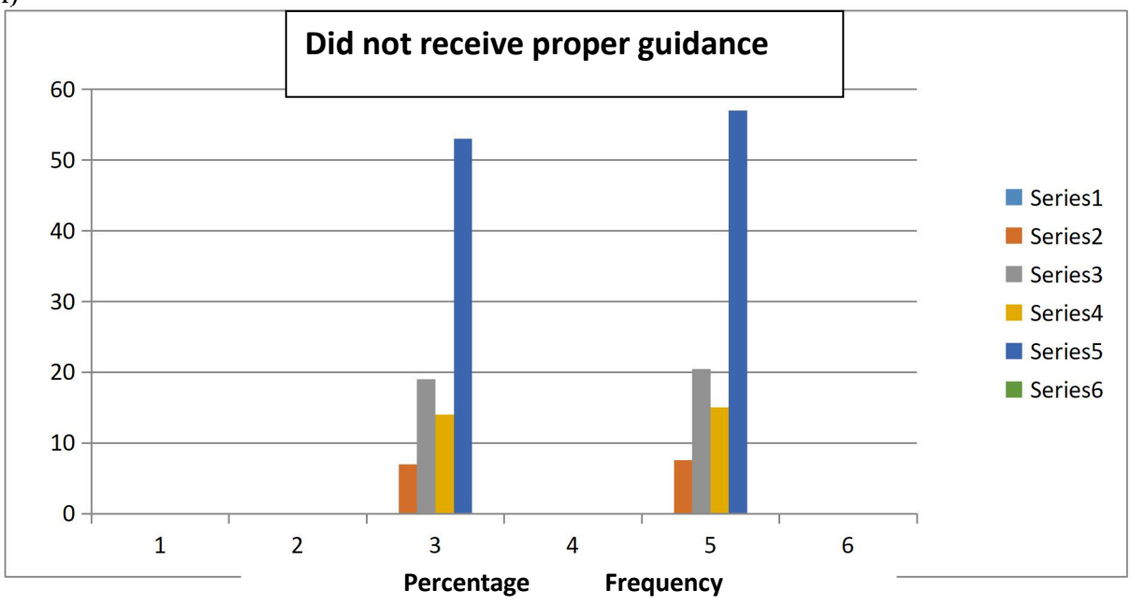

Table 22: ***The availability of TB diagnostic services in my area was limited, causing delays***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	10	10.6	10.8	10.8
	Disgree	20	21.3	21.5	32.3
	Neutral	18	19.1	19.4	51.6
	Stongly Agree	45	47.9	48.4	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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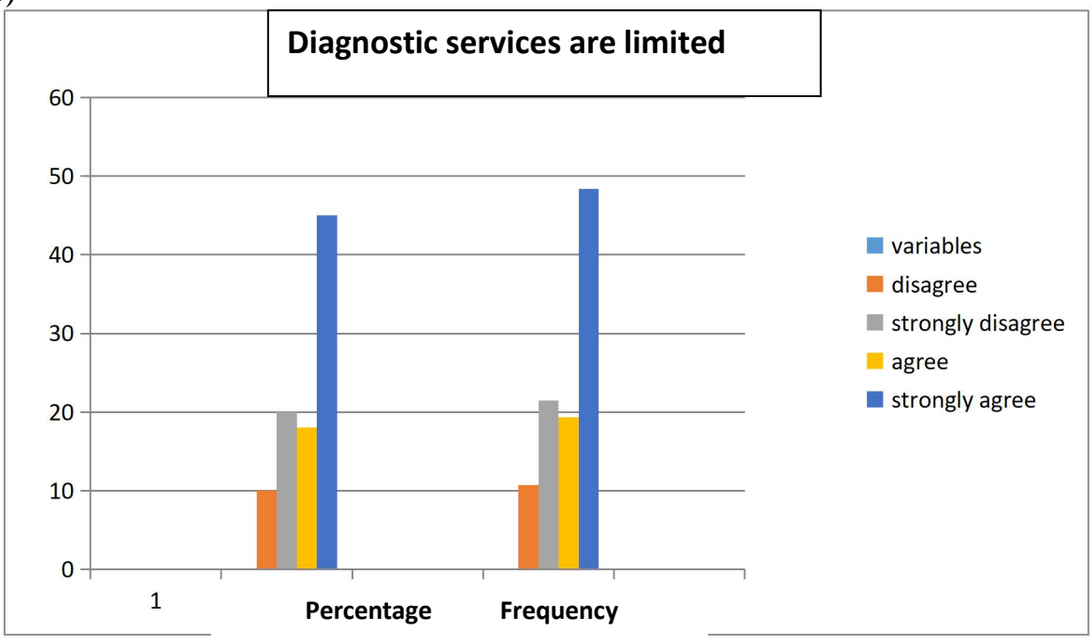

Table 23: ***I delayed seeking medical care because I could not afford consultation fees***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	8.5	8.6	8.6
	Disgree	14	14.9	15.1	23.7
	Neutral	25	26.6	26.9	50.5
	Stongly Agree	46	48.9	49.5	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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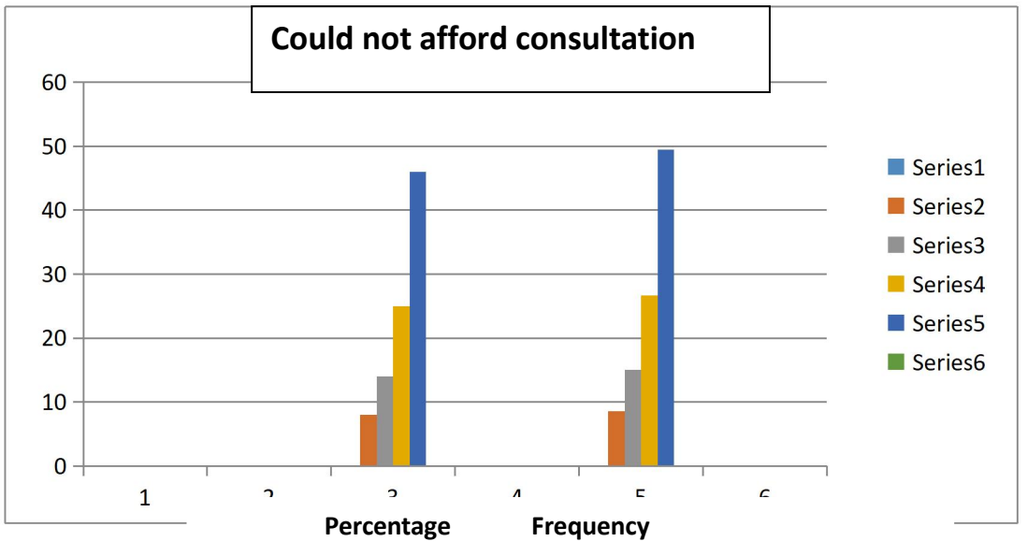

Table 24: ***The cost of transportation to a hospital or clinic was a barrier to getting tested for TB***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	3.2	3.2	3.2
	Disgree	10	10.6	10.8	14.0
	Neutral	36	38.3	38.7	52.7
	Stongly Agree	44	46.8	47.3	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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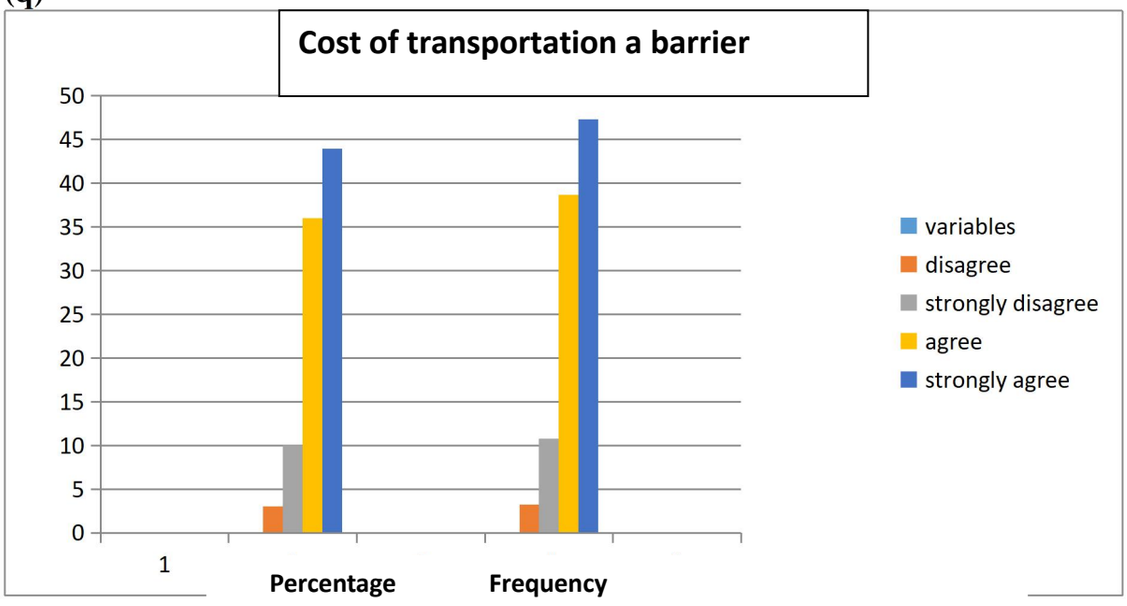

Table 25: ***I was concerned about the financial burden of long-term TB treatment, so I postponed seeking care***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	5.3	5.3	5.3
	Disgree	12	12.8	12.8	18.1
	Neutral	31	33.0	33.0	51.1
	Stongly Agree	46	48.9	48.9	100.0
	Total	94	100.0	100.0	

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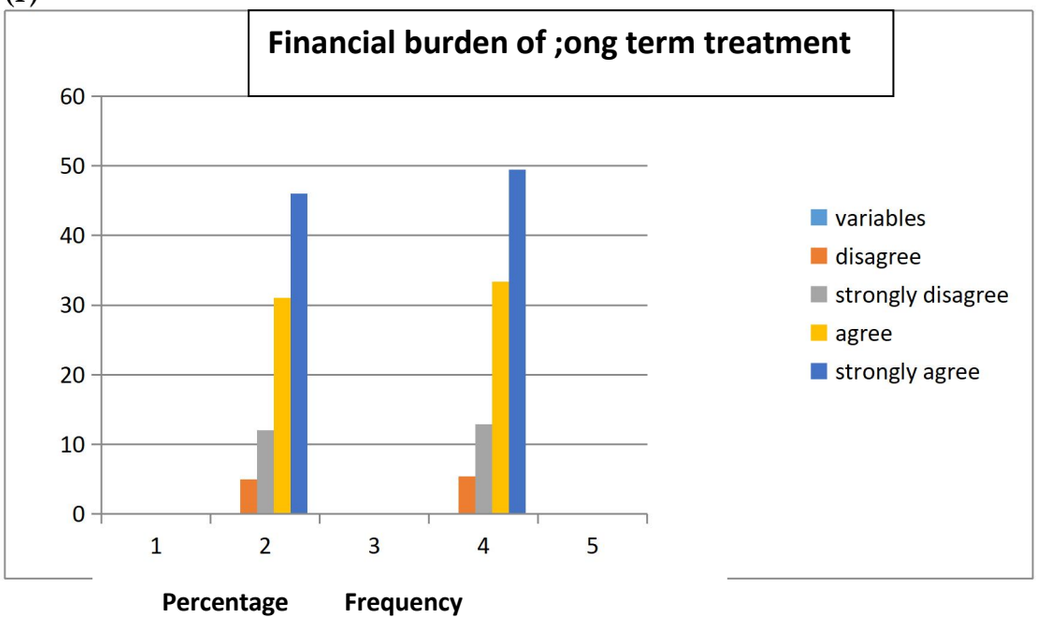

Table 26: ***I was afraid of being judged by my community if diagnosed with tuberculosis***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	8.5	8.6	8.6
	Disgree	11	11.7	11.8	20.4
	Neutral	26	27.7	28.0	48.4
	Stongly Agree	48	51.1	51.6	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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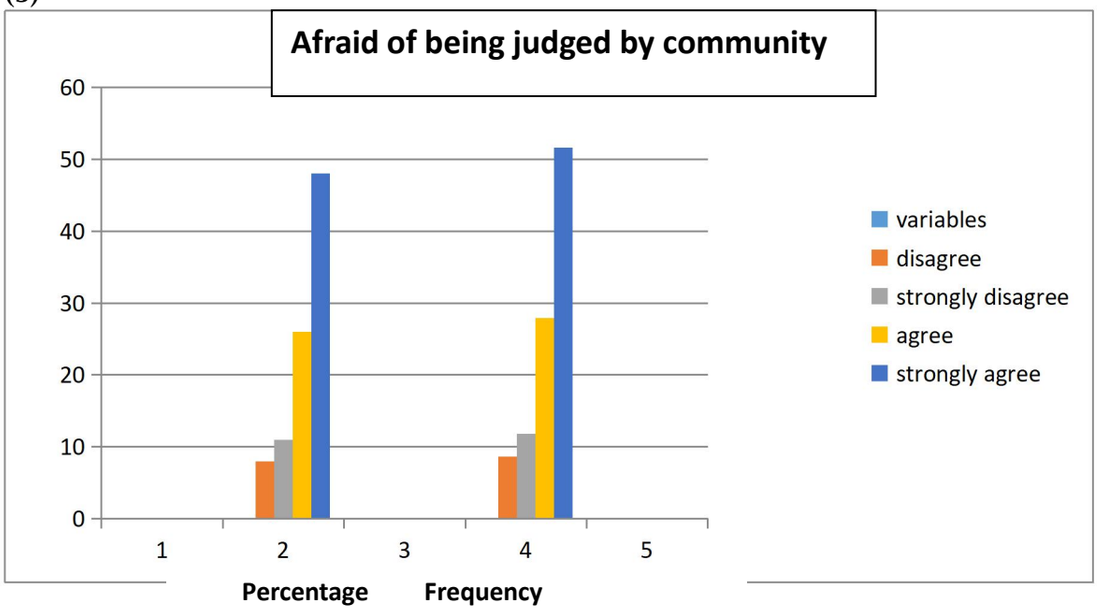

Table 27: ***I hesitated to tell my family or friends about my symptoms due to fear of discrimination***

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	4.3	4.3	4.3
	Disgree	12	12.8	12.9	17.2
	Neutral	28	29.8	30.1	47.3
	Stongly Agree	49	52.1	52.7	100.0
	Total	93	98.9	100.0	
Missing	System	1	1.1		
Total		94	100.0		

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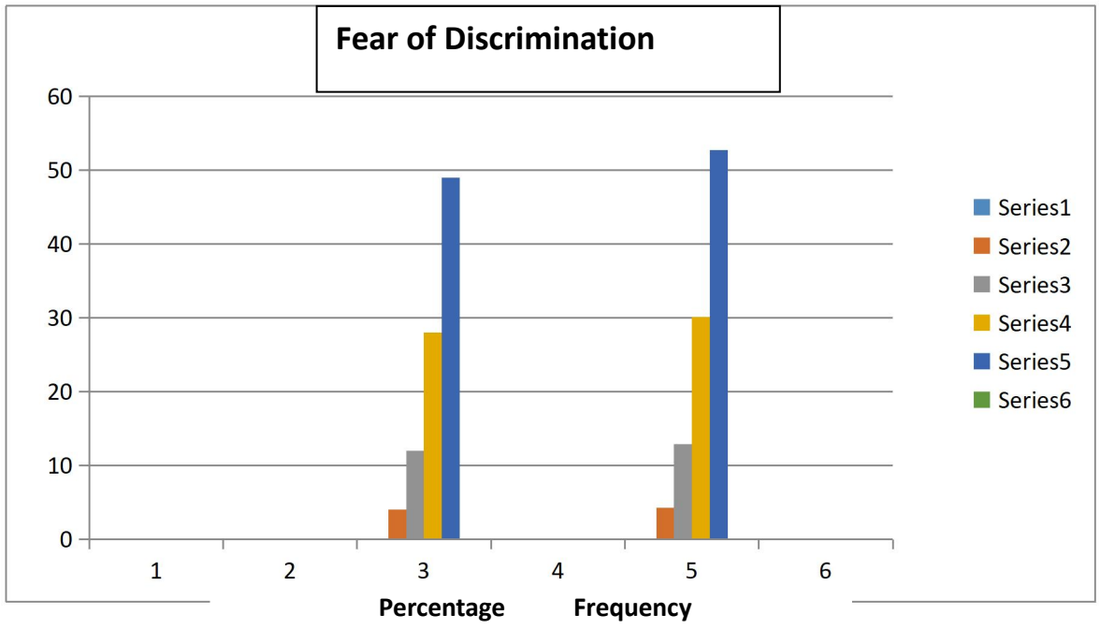

Figure#(a,b,t)

This paper outlines the dimension of multi-factorial nature of delayed TB diagnosis in Pakistan, suggesting that healthcare access states, socio-economic inequity, knowledge gap on the side of healthcare providers, and cultural stigma contributed to the problem to the greatest degree. Above Figures explain in line with the regional and global literature, results indicate that patients in rural and low-income populations have delays in diagnosis; this is because of lack of funds, infrastructure, and diagnostic facilities. Such classification is further complicated by inadequate training of health personnel on TB due to its similarity in signs and symptoms with other respiratory diseases such as COVID-19. Still, cultural stigma is present and it continues to deter patients to obtain prompt services and care due to fear of social alienation. The refugee community is also under the legal and social pressure where the problem of access to healthcare is a severe issue. An integrated initiative addressing these drivers necessary includes reinforcing the healthcare system, raising community awareness, reducing stigma, and enhancing training of frontline healthcare workers to enhance the early detection and prevention of TB as well as disease transmission.

Economic Constrains and Money Prohibitions

Financial penalty was identified as a key issue when it came to accessing timely diagnosis by the participants. Almost a half (49.5) percent of the respondents suggested that they spent a lot of time in delaying the visit to the healthcare delivery, owing to the fact that they were not able to afford the services. Even though TB diagnosis and treatment are not supposed to cost the individual in government hospitals, costs of doctor consultation, comorbidity laboratory tests, and follow-ups might still be a burden.

Another source of financial impediment was transportation. In reference to reasons contributing to delay in about 47.3 percent of participants said that it was influenced by high cost of travel to distant hospitals or clinics. Such expenses can be especially harmful to

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those living in rural regions where the road infrastructure is bad and there is a limited number of means of transportation.

Improper payment of long-term treatment was a matter of concern among the participants. Approximately 49.5 percent of the respondents strongly agreed that fear of cost of treatment over some months prevented them to seek early diagnosis. Patients will still lose money no matter whether the drugs are provided free or not in terms of missed work, additional nutrition, and frequent tests.

Such costs are particularly overwhelming to women who could rely on their male relatives to pay healthcare-related costs. This dependence adds to the delay factor because women might find themselves in a position to get treatment on their own due to lack of money or support to travel.

Patterns and Implications in a Nutshell

The results of the current research affirm that the late diagnosis of TB in Bahawalpur is caused by an intricate interaction of social-demographic vulnerabilities, misleading information, cultural stigma, inefficiencies of the healthcare system, and financial limits. The most susceptible population seemed to be women below 30 years of age and those living in low-income families. Knowledge gaps concerning the symptoms of TB and the delivery of competent care in the state health sector were still present despite the high levels of education among part of the participants. It is an indication of a missing health education and outreach.

The behaviors that came in the way of early intervention included the use of folkloric medication and the unwillingness to seek professional help because of the fear or the stigma associated with it. The performance of health systems, their involvement in misdiagnosis, poor communication and options of diagnostic tools was also proven to be relevant. Lastly, there existed perceived and actual financial constraints, which were significant barriers that prevented patients to seek treatment early on in the disease.

Finally, the data given in the present section confirm that delayed TB diagnosis in Bahawalpur is a complex issue in terms of public health. The results show that besides the medical barriers that prevent early diagnosis, there are more extensive socio-economic, psychological, and cultural factors. These problems will not be solved with a specific method but rather be addressed with the combination of community education, capacity building of medical professionals, better diagnostic facility, reduction of stigma measures. Further, pertaining to burden reduction of TB and accomplishment of objectives of national and international TB control programs, intervention should be culturally sensitive and affordable.

Conclusion

In conclusion, the delay in TB diagnosis in Pakistan is multifaceted, involving limited healthcare access, socio-economic barriers, inadequate healthcare provider training, cultural stigma, and immigration status. These findings are consistent with global research, particularly in low- and middle-income countries, where similar issues are prevalent. Addressing these challenges requires targeted public health strategies that improve access to care, reduce stigma, enhance healthcare provider training, and promote early TB diagnosis. A comprehensive approach that includes policy reforms, community engagement, and international cooperation is essential to reducing TB diagnosis delays in Pakistan.

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Recommendations

1. Effectiveness of public health education campaigns on TB diagnosis delays.
2. Impact of socio-economic factors on timely TB diagnosis in Pakistan.
3. Level of TB-related training among healthcare providers in primary care settings.
4. Role of technological innovations in accelerating TB diagnosis in resource-limited areas.
5. Impact of stigma on delayed TB diagnosis and targeted interventions.
6. Effectiveness of policy reforms in reducing TB diagnosis delays.
7. Influence of immigrant status on TB diagnosis and healthcare access.
8. Financial barriers to TB diagnosis and proposed solutions.
9. Multi-sectoral approaches to improving TB diagnosis across various sectors.
10. Longitudinal tracking of factors contributing to TB diagnosis delays.

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