

Illness Perception, Perceived Social Support and Quality of Life in Pulmonary Tuberculosis Patients

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ABSTRACT

The objective of the current study is to determine the relationship between illness perception, perceived social support and quality of life in pulmonary tuberculosis patients. To this end, the World Health Organization Quality of life scale, the Brief Illness Perception Questionnaire, and the Multidimensional Scale of Perceived Social Support were used to measure the relationship between variables. The quantitative approach was used, with purposive sampling. A total of 150 patients with pulmonary tuberculosis were part of the final sample. Hierarchical multiple regression results indicate that social support of family, friends, and significant others, are significant positive predictors of quality of life in pulmonary TB patients. This study has implications for designing better health and social policy for pulmonary tuberculosis patients with respect to (i) advancing support from significant others, (ii) strengthening quality of life through daily activities and work opportunities, and (iii) provision of medical and treatment information consistently.

Keywords: Illness Perception, Perceived Social Support, Quality of Life, Pulmonary Tuberculosis

INTRODUCTION

According to the World Health Organization (WHO), TB can have a deadly effect and it can be developed anytime and from anywhere. Mostly adults have a higher rate of developing TB. Men are more likely than women to experience pulmonary tuberculosis (TB) and globally TB patients comprise a large group of an estimated 10 million people (MacNeil et al., 2019). The prevalence rate has been declining very slowly in recent years. Likewise, in 2020 almost 208,000 additional deaths were reported. Also, it has been observed that males above the age of 15 years have more vulnerability to TB disease and death rates. About 32% of women and 12% of children mostly under 15 years are affected by TB in 2019 (Global Tuberculosis Report, 2020).

It has been seen that in the members of the *Mycobacterium tuberculosis* complex (MTBC), *Mycobacterium tuberculosis* is primarily caused by an infection in humans. *Mycobacterium Bovis* is also responsible for causing zoonotic TB infection in humans. It is rarely caused by TB infections and sometimes zoonotic TB is medically or pathologically unrecognizable due to *Mycobacterium tuberculosis* (Mirza & Jenkins, 2004). A study revealed that 43% of TB patients' caregivers are with TB patients for almost 5 to 6 hours which is why the patient's caregivers are more vulnerable to getting infected with TB. Usually, the homes of people with active TB are known as TB breeding grounds because the disease is spreading from their places. Most of the active cases of TB are found in the homes of TB patients and their support groups (Williams et al., 2017).

Theoretical framework

The Health Belief Model has been used to explain TB patients' preventive behaviors which helps

them to cope with the disease. According to this model, there are four main constructs perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. Perceived susceptibility refers to a person's belief that they might be at risk of this disease and if it's related to TB then patients believe that tuberculosis can affect them, and they might be at higher risk of getting the TB. But this varies from person to person depending upon patient beliefs. From a social-cognition theory point of view, perceived social support helps in enhancing the self-esteem of an individual and helps the person deal with the situation in a better way, which in turn leads to positive mental health results. Perceived social support is associated with positive thoughts about oneself. Therefore, self-esteem has a direct and indirect effect on mental health consequences (Lee et al., 2014).

LITERATURE REVIEW

Illness Perception in TB Patients

Illness perception refers to personal thoughts that people have about the disease. It is an important determinant of behavior and is associated with a number of outcomes, such as willingness to continue treatment and speed of recovery (Sawyer et al., 2019). A study reported that TB patients need more information about the disease because this information helps the patient in illness perception and also gives the patient strength to feel more confident and active in their TB treatment (Mohammed et al., 2015). The WHO endorses that it is important to give educational, emotional, and financial support to TB patients so they can complete their treatment without any barriers. The perception of the disease in TB patients requires that healthcare providers design and monitor any intervention that provides holistic support and care for the patients receiving TB treatment (MacNeil et al., 2019).

Illness perception is also an important contributing factor that is related to a number of

outcomes, such as treatment restrictions and active rehabilitation. Previous research has shown that TB patients can be diagnosed by examining their perceptions of the disease because it identifies the problems that may interfere with treatment. In addition, examining illness perception in patients helps researchers to understand patients' beliefs about their illnesses (Mohammed et al., 2015). Illness perception is a very important factor that helps patients with TB to fight the disease. TB patients are usually found to be worried about their illness because they get information from hearsay and as a result, they have false information and start to believe that the illness will last for a long time and as a result, their quality of life and emotions are negatively affected (Nirmal et al., 2019). TB patients' perceptions of the disease can affect their commitment to treatment and thus they require programs to strengthen their quality of life in various areas such as daily activities and work, especially TB information that helps them with illness perception. Similarly, if TB patients have a strong illness perception but they don't have perceived social support it also affects their psychological and mental health (Mohammed et al., 2015).

Perceived severity means the person believes that the disease is deadly, and it has dangerous effects on people's mental and physical health. Patients of TB consider that Tuberculosis has many serious effects, and it can lead to death if left untreated (Centis & Migliori, 2015). Perceived barriers are those things that make the person unable to adapt for overcoming the disease. Pulmonary TB patients face major barriers like illness perception, TB stigmatization, low-quality treatment services, financial issues, and lack of social support (Lawn et al., 2013). Perceived benefits help the patient to practice those behaviors that help them in dealing with TB disease. People behave when they perceive that it is helpful for them and their families, and they accept the severity of the condition and start taking preventive measures (Manches et al., 2014).

One of the main reasons for the failure of treatment and the increase in the spread of TB is the poor perception of the disease. It has been observed that TB and its treatment modalities are not yet well understood by patients, however, a significant effort to reduce TB prevalence over the years has been made to increase TB medications (Creswell et al., 2011). A study of TB patients showed higher rates of depression and anxiety in those TB patients who had poor illness perception, as were more negative perceptions of health. Thus, the treatment of psychiatric problems in TB patients may improve treatment effectiveness, although more research is needed in this area (Sofian et al., 2015).

A study found that illness perception or appropriate information about symptoms affected more pulmonary tuberculosis patients. Still, studies have repeatedly proven that only half the information is given by those who are familiar with the experience of symptoms, such as healthcare providers and medical consultants. A wrong perception of illness affects the treatment of tuberculosis, whereas a right illness perception can provide information that can help improve treatment rates in TB patients, especially in improving the effectiveness of treatment. One must know the complex psychological and social characteristics of the disease, for overcoming the illness and enhancing the treatment efficacy so, a comprehensive treatment approach can be adopted (Suleiman & Sahal, 2012).

Social Support for TB Patients

Social support involves the reaching out of family and friends in times of need or crisis so that an individual can get wider attention and develop a positive self-image. Social assistance improves the quality of life and provides a buffer against negative life events (Dalgard et al., 2014).

Similarly, perceived social support is defined as the amount of real care received, from family, friends, and the community. In addition, social support is an essential buffer for life-threatening events (such as the diagnosis of TB), and higher social support leads to increased treatment and

better treatment outcomes. There is evidence that patients who receive adequate amounts of social support are more likely to have greater mental health outcomes such as lower depression and increased quality of life (Deshmukh et al., 2018).

People with close social ties report higher levels of well-being. Perceived social support affects the way people understand themselves and others. A meta-analysis shows that a lack of meaningful relationships in life predicts more deaths than other lifestyle behaviors, such as smoking or other harmful acts (Poots & Cassidy, 2020). Social support comes from four sources, the first one is informational help, which refers to any useful information that helps a person solve problems and deal with stressors. The second is emotional support, which refers to providing empathy, trust, encouragement, and care given by others and helps in dealing with emotional challenges. The third is friendship, which provides a person with a social network, and another being whom they can depend on in times of crises. The last one is material support which refers to all the three discussed above and includes financial support to deal with challenges related to borrowing money or taking loans (Keshavjee et al., 2014).

Perceived social support and social bonding are positively related to mental and physical health. Research has shown a positive association between perceived social support and psychological well-being, which is viewed as a valuable protective method and promotes psychological well-being by maintaining positive emotional feelings and reducing stress (Saqib et al., 2019). If patients are treated carefully and have support from their families and their surroundings, this can result in increased treatment compliance rates and increased patient psychological well-being. Unfortunately, TB patients are more vulnerable to poor mental health. However, patients who have strong social support are more likely to have better mental health and improved health outcomes (Jelsma & Mlambo, 2018).

Perceived social support is known as one of the important factors to help TB patients in

their treatment. A recent study investigated the impact of social support on TB and they found a positive effect on stress relief, and treatment effectiveness (Malik et al., 2018). Similarly, those TB patients who have support from communities have a much better quality of life than those who have no social support because the community has great potential to provide valuable social support to patients. Family and community involvement has been found to be one way to enhance the treatment outcomes for TB patients (Jaber et al., 2016). For better mental health and enhanced treatment effectiveness, TB patients need social assistance, and the appropriate time for counseling and psychoeducation about their condition, which will relieve the mental and social distress of patients. Also, other factors that help TB patient to overcome this disease is illness perception and perceived social support. If they have poor social support it leads to making patients feel neglected, isolated, and useless (Brooks & Dunn, 2016).

Research shows that TB is considered a very deadly, contagious, and incurable disease. Due to this belief, people face many social consequences like stigma related to TB disease and social isolation of TB patients and their families. Younger TB patients and even their family members are less likely to get married due to this disease. TB in a single partner can lead to divorce. Out of fear, patients often refuse the diagnosis and refuse to take treatment. Both male and female TB patients face many social and economic problems, but female TB patients are the most affected. It has been seen that divorce and broken engagements are more common in female TB patients (Liefoghe et al., 1995). A study stated that perceived social support is one of the best and most effective ways for pulmonary TB patients to respond more positively to their treatment. Social support is known as the flow of information to the person to ensure that they have support, care for, and love from their community and also have a setup of mutual responsibilities. Other research attempted to find out the importance of social assistance available to TB patients and it was found that social assistance reduces stress, improves response

to treatment, and improves the quality of life (Alagna et al., 2015).

Quality of life of TB Patients

Quality of life refers to an individual's perception of their life or position with regard to their environment, life and overall circumstances. Health-related quality of life is a concept that combines an individual's physical, emotional, and social components with his or her medical condition or treatment. A study found that the overall quality of life among TB patients was relatively poor (Khanna & Tsevat, 2007). Quality of life in patients with TB is poor because they face many challenges such as long-term treatment, a lot of medicines and their toxic reactions and side effects, lack of social support, low acceptance of the disease, and family and lifestyle changes. Marital life is also at risk for TB patients, as their physical health can get worse with time and healthcare services are limited in developing countries (Ogunyemi et al., 2018). The association of disease perception with declining quality of life has also been found in TB patients (Brown et al., 2015).

TB is a major disease that affects the patient's daily activities. The effect of TB on the patient's health is important as it can lead to changes in quality of life and changes in their perceptions and consequently affects the outcome of treatment (Kakhki & Masjedi, 2015). TB can often lead to depression and anxiety or contribute to the worsening of health conditions in patients and affect the treatment outcomes, which results in fear and frustration in patients. As a result, feelings of frustration increase, day by day, and the quality of life is known to decrease in TB patients (Sulehri et al., 2010).

There was qualitative research on TB patients which shows that psychological factors are an important component of TB patients' treatment effectiveness (Shiratani, 2019). The study found that the patients tried to take care of their mental health and their personal needs because it affects their quality of life as they realized the meaning and value of their lives after being

affected by pulmonary TB. Literature also suggests that it is common to find a link between tuberculosis and psychological impact because of social and medical risk factors that influence the patient's mental health (Shiratani, 2019). Patients with TB are more likely to have psychological distress in developing countries (Masumoto et al., 2014). Studies show that TB patients have higher rates of depression and anxiety than those who do not have TB.

A study stated that quality of life is a wide concept that is related to all domains including physical, social, psychological, financial, and spiritual. It is still not a proper measuring tool for assessing one's quality of life, but it might be examined in the context of the culture and value system in which they live and their place in life concerning their goals, beliefs, principles, and concerns. In the context of pulmonary TB, patients' life is deteriorated because of the disease; they can experience deterioration, not just in their physical health but also in all domains of life which leads to poor mental health and bring negativity to TB patients (Aggarwal, 2010).

A study examined the role of stigma related to TB, and it found that stigma related to TB is one of the most important factors that affect the whole quality of life of TB patients, and they are stigmatized by both family and society (Nilima & Shilpa, 2017). Another study conducted to assess the health-related quality of life (HRQoL) in TB patients, concluded that health-related quality of life must be assessed regularly because it helps the medical professionals to make the treatment plan according to the need of the patient and decide which strategies will be more effective for them in improving recovery rate and patients' quality of life (Halimah & Diantini, 2013).

Pakistan's TB disease burden

There are so many diseases that are common in Pakistan, including local and epidemic infectious diseases, emerging infections, and non-communicable diseases. According to a report from the World Health Organization (WHO) 620,000 people have pulmonary tuberculosis (TB), 410,000

new cases are reported and 59,000 people die each year due to TB (Geofrey, 2020). An estimated 8-9 million people are diagnosed with the Hepatitis C virus (HCV) in Pakistan, which increases the risk of chronic liver disease and cancer, (Qureshi et al., 2010), and also increases the risk of anti-tuberculosis drug-induced hepatotoxicity among patients with pulmonary tuberculosis. In Pakistan, each year 510,000 new TB cases are reported and about 15,000 drug-resistant TB cases are reported (Qureshi et al., 2010). Also, Pakistan is the fifth most high-burden country in the world which has 61% of the TB burden. The reasons for the higher prevalence of TB are delayed diagnosis, not enough professionals, inadequate medication procedures, no follow-up after the treatment, and lack of support from family, friends, and society for high-risk patients. A local study from Karachi which is Pakistan's largest economic center and a city with a special privilege for the low-income population, who have little access to healthcare, shows dismal findings (Akhtar, 2017). The low-income population suffers from many diseases due to improper diet and hygiene and therefore TB patients in this area have fewer resources for treatment and have poor illness perception. Many face depression and almost 52% of patients are affected by TB. If this is the case in a large urban city in Pakistan, we can expect much worst circumstances for remote populations affected by TB.

Another study found that 67.9% of the respondents believed that they were at risk of getting TB (Rahman et al., 2003). In Pakistan, 72% of TB patients show severe to moderate levels of psychological distress that affect their daily life functioning. Psychological distress due to pulmonary TB disease can affect a person's ability, preventing them to look after their mental health, and it can worsen a TB patient's physical condition (Mohammed & Coker, 2011).

The relationship between illness perception, social support and quality of life

Research also shows that there is a strong relationship between illness perception and perceived social support in the context of TB patients because patients get treatment for their disease but

they are still not able to cope due to a lack of social support (Thomas et al., 2016). A study was conducted to see the effect of perceived social support on TB patients and found that social support scores of TB patients were lower than the national average (Chen et al., 2013). The study revealed that social support is more important than medication but unfortunately TB patients did not receive it. Limited social support for TB patients was a major risk factor for the negative attitude toward medication and non-adherence to treatment. The study results showed overall that TB patients do not have social support from their family, friends, and communities.

Another study explored the role of social assistance in drug restriction in pulmonary tuberculosis patients in western India and focused on the experiences related to emotional and social support among pulmonary tuberculosis (TB) patients (Nirmal et al., 2021). Participants shared that empathy, illness perception, neglect, lack of social support, poor relationships with family, and friends, and rude behavior of healthcare providers affect the process of their treatment. Social support does not mean the presence of a family or friend, the important thing is the quality of relationship with that person and experiences with family and friends or community. The study found that older TB patients needed more social support than younger ones, whereas younger TB patients required less perceived social support because they have a strong immune system and more energy. Comparatively, people above the age of 40 years, need more attention from family, friends, and the community. Also, in Pakistani culture and according to a religious point of view, helping the sick and the elderly is believed to be rewarded by God (Paz-Soldán et al., 2013).

There is another study that suggested that TB patients who received an adequate amount of perceived social support from family, and society had a higher amount of quality of life and better mental health as compared to those who did not get social support from their supportive groups or friend (Javed, 2016). Social support helps in the recovery and also reduces the negative

attitude about the disease which will make it more unbearable for the patient and as a result will affect the quality of life of pulmonary TB patients.

Self-care is found to be an important element in controlling pulmonary tuberculosis disease. A study has shown that strong illness perception, more social support for patients, talking therapy (counseling), and self-care increase the quality of life of TB patients (Jaber et al., 2016). One study was conducted in Pakistan to measure the quality of life of pulmonary tuberculosis patients (Malik et al., 2018). The results of the study concluded the serious effects of pulmonary TB experienced by patients in the context of quality of life, especially in all social and physical aspects. Despite new treatment strategies and the free availability of drugs, the quality of life of TB patients was poor.

Aim of study

The study's goal is to determine how individuals with pulmonary tuberculosis perceive social support, their health, and their quality of life. The study has the following research objectives:

1. To determine the association between illness perceptions and quality of life in patients with pulmonary TB
2. To examine the link between perceived social support and quality of life in patients with pulmonary TB
3. To identify the predictors of quality of life in pulmonary TB patients
4. To find the difference in the level of quality of life in patients with pulmonary TB based on the age and education of the patient

METHODOLOGY

Ethics

Permission was sought from the Head of the Department of Psychology, The University of

Lahore, and the Ethic Review Committee (ERC) of the Psychology Department, Lahore School of Professional Studies, The University of Lahore. Participants were provided with information about the nature of the study and their verbal informed consent was taken. Participants had the right to withdraw from the research at any time. Their identity was kept confidential throughout the study.

Research Design

A correlational research design was used to address the research objectives and a survey method was used to collect data. The relationship between illness perception, perceived social support, and quality of life in pulmonary tuberculosis patients was investigated through a closed-ended survey.

Hypotheses of the study

H1. There would be a significant negative relationship between illness perception and quality of life in pulmonary TB patients.

H2. There would be a significant positive relationship between perceived social support and quality of life in pulmonary TB patients.

H3. Illness perception and quality of life would predict the quality of life in pulmonary TB patients.

H4. Younger TB patients and those with higher education would have a better quality of life

Sample selection

Purposive sampling technique was used to collect data from pulmonary tuberculosis patients in different government hospitals in District Muzaffargarh. A total of 150 participants were part of the final analysis (75 males and 75 females).

Measures

The closed-ended survey included demographic questions and items from internationally

standardized scales.

Demographic Questionnaire

A demographic sheet was prepared for the study, which included the participant's demographic information such as age, gender, education, and level of and severity of illness.

Brief Illness Perception Questionnaire

The Brief Illness Perception Questionnaire was used which has been created by Broadbent. The present study employed a translated version of it (Broadbent et al., 2015). The survey was used to assess how pulmonary TB patients felt about their condition. The nine components in it stand for the nine construction-related dimensions: Outcomes, Timeline, Personal Control, Treatment Control, Identity, Anxiety, Understanding, and Emotional Response. A Likert scale from 0 to 10 was used to rate the first eight items. With a Cronbach's alpha of 0.73, its test-retest reliability was good (Broadbent et al., 2015).

Multidimensional scale of Perceived Social Support

The Multidimensional Scale of Perceived Social Support was used to measure perceived social support. The scale uses a 12-item multidimensional scale of perceived social support with a seven-point Likert scale. From "very strongly disagree" (score of 1) to "very strongly agree" (7). The scale's elements were broken down into three social support factors family, friends, and significant other. The scale's internal consistency was strong, with a Cronbach's alpha of 0.84 (Wilcox, 2010).

World Health Organization Quality of life scale (WHOQOL).

To measure the quality of life in respondents, the World Health Organization Quality of life scale was used (WHOQOL, 2020). It consists of 26 items, rated on a five-point Likert-type scale. This questionnaire was about how people feel about their quality of life, health, or other areas of life. The internal consistency of the scale was good with a Cronbach's α of 0.84 (Vahedi, 2010).

Reliability Results

Table 1 presents Cronbach's Alpha for the three scales of this study. The illness perception scale includes 8 items, and the Cronbach Alpha is 0.71; the perceived social support scale includes 12 items and the Cronbach Alpha value is 0.81, and the quality of life scale includes 26 items with a Cronbach's Alpha of 0.76.

Table 1
Cronbach's Alpha of Illness Perception, Perceived Social Support and Quality of Life (N=150)

Variable	No. of Items	α
Illness Perception	8	0.71
Perceived Social Support	12	0.81
Quality of Life	26	0.76

Note. α =Cronbach's Alpha

Data analysis

The results obtained from the questionnaires were analyzed with the help of SPSS version 21. Descriptive statistical analysis was used. Pearson product-moment correlation was used to measure the relationship between variables. ANOVA test was used to compare the means of demographic variables (age, education), and finally, hierarchical regression was used to predict outcome variables.

RESULTS

Descriptive Analysis

Data from Table 2 reveals that there are more participants in the age group 18-26 years (34.7%). There are more males (50.7%) than females 74 (49.3%). With regards to education, a significant number of sampled patients are uneducated (22. %), and most others have attained primary education (44.0%),

Table 2
Frequencies and Percentages of Demographic Characteristics of the Participants (N = 150)

Variables	F	%
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WHOQOL	---	---	---	---	---	---
Mean	20.07	58.61	19.63	19.78	19.50	81.85
SD	3.06	9.27	5.07	4.40	3.70	11.55

Note. IP= Illness Perception, M= Mean, SD= Standard Deviation, PSS= perceived social support, WHOQOL= quality of life ***p < .001

Regression Analysis

Table 4 shows that family is a highly positive predictor of quality of life however, friends and significant others are also significant positive predictors of quality of life.

Table 4
 Hierarchical Multiple Regression Analysis for Quality of Life (N = 150)

Variable	B	SE B	β	R ²	Adjusted R ²
Step 1				.18	.16
Family	.55	.18	.41***		
Friend	.44	.20	.17*		
SO	.58	.25	.19*		

Note. B= Unstandardized coefficient, SE B= Standard Error of Beta. b= Standardized Coefficient. R²= Coefficient of Multiple Determination. SO=significant others *p < .05, ***p < .001

ANOVA Results

Table 5 shows the mean, standard deviation, and F-value in quality of life of pulmonary TB patients in three categories of age. The result indicated significant mean differences across different age groups. Participants between the ages of 18-25 had higher quality of life compared to people in higher age brackets (M=83.54 was a higher mean difference as compared to age 26-35 (M=82.04) and age 35-80 (M=79.79) on quality of life. The value of eta square η^2 was .01 which indicated lower than small effect size.

Table 5
 One Way Analysis of Variance (ANOVA) in Quality of Life of Pulmonary Tuberculosis Patients in Three Categories of Age (N = 150)

Variable	18-26 years (n = 52)				(n = 47)		<i>p</i>	<i>F</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
WHOQOL	83.54	10.21	82.04	10.99	79.79	13.33	.03*	1.31	0.01

27-35 years (*n* = 51) 36-80 years

Note. WHOQOL= quality of life, **p* < .05.

Table 6 shows the mean, standard deviation, and F-value in quality of life of pulmonary TB patients in four categories of education. The result indicates significant mean differences across different levels of education and uneducated groups. Respondents with intermediate education (M= 83.78) had higher mean difference as compared to primary level education (M=83.88), uneducated (M=77.67) and those with just matric level education (M=81.06) on quality of life.

Table 6
 One Way Analysis of Variance (ANOVA) in Quality of Life of Pulmonary Tuberculosis Patients in Four Categories of Education (N = 150)

Variables	Uneducated		Primary		Matric		Intermediate		p	F	η ²
	M	SD	M	SD	M	SD	M	SD			
WHOQOL	77.67	10.66	83.85	11.98	81.06	10.42	83.88	12.43	.02*	2.30	0.04

Note. WHOQOL= quality of life, **p* < .05.

DISCUSSION

The study examines the relationship among illness perception, perceived social support, and quality of life of pulmonary TB patients. The first hypothesis of the study is rejected. Our results show a non-significant negative correlation between illness perception and quality of life. The reason could be the perception of the support they have been receiving from their surroundings. This might alter the negative perception of the disease. Evidence suggested that perceived social support is an important factor for TB patients when they fight the disease because social support and family support help the patient to understand their illness better.

The second hypothesis of the study is proven. Our results reveal that there is a significant and positive relationship between perceived social support and quality of life. Other evidence

supports our results that TB patients who receive an adequate amount of perceived social support from family and society have a higher amount of quality of life and better mental health as compared to those who do not get social support from their family or friends (Khan et al., 2017). The help received from family and social networks improved the patient's condition and positively affects the quality of life of affected pulmonary TB patients (Saleem et al., 2018). Our results show that when pulmonary TB patients have strong perceived social support from their surroundings, family, and friends they have better perceptions of their symptoms and treatment.

The third hypothesis of the study is partially accepted. Our results reveal that perceived social support from family, friends and significant others are significant positive predictors of quality of life in pulmonary TB patients. The fourth hypothesis of the study is also proven. Our results show a significant difference in the level of quality of life in patients with pulmonary TB on the basis of age and education, with younger and more educated patients showing the better quality of life. The study results are in line with previous literature, which also confirms that younger patients have better life quality (Adeyeye et al., 2014). A possible explanation is that advancing age leads to degenerative changes and several other conditions which compromise the quality of life. Other research also confirms that participants with higher education have more quality of life (Louw et al., 2012).

Limitations

The sample size for this research was small because it was very difficult to access the TB patients so the results cannot be generalized. The results are from public sector hospitals of one city and do not represent the entire nation or private sector patients. In addition, this study did not attempt to identify if patients with TB were suffering from any other health condition which would also affect their quality of life.

CONCLUSION AND RECOMMENDATIONS

This research aimed to identify the quality of life challenges faced by patients of pulmonary tuberculosis. The results of this study show that when pulmonary tuberculosis patients do not have the proper information about their disease, or have positive attitudes about their illness, and don't get perceived social support, their quality of life is affected adversely, both in terms of mental and physical health. With the help of this study, we have been able to identify factors such as perceived social support, disease perception, and health information, which can help TB patients when they are struggling with the disease and improve their quality of life and ability to gain better treatment and recovery. This study could be used to educate pulmonary TB patients, TB patients' families, and various health professionals to reduce the stigma around the disease and improve social support and acceptance.

Conflict of Interest Statement

No conflicts of interest are disclosed by the authors.

Funding Information

No funding has been provided for this study.

Ethics and Permission

The study gained ethics clearance from the Departmental Ethical and Research Committee of the Psychology Department, Lahore School of Professional Studies, The University of Lahore.

Author Contributions

HH planned the study with the approval and guidance of MNI and MR. HH collected the data and drafted the paper. MNI, MR and FJ assisted in data analysis. All authors approved the final manuscript.

Data sharing and availability statement

The associated author will provide data upon request.

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REFERENCES

- Aggarwal, A. N. (2010). Health-related quality of life: A neglected aspect of pulmonary tuberculosis. *Lung India: Official Organ of Indian Chest Society*, 27(1), 1.
- Akhtar, S., Hasan, R., & Ahmed, F. (2017). Hyper endemic pulmonary tuberculosis in peri-urban areas of Karachi, Pakistan. *BMC Public Health*. 3(7), 1-70
- Alagna, R., Diaw, M. M., Centis, R., Cirillo, D. M., & Besozzi, G. (2015). Universal health coverage and social support in Senegal: a comprehensive approach against tuberculosis. *European Respiratory Journal*, 46(3), 869-871.
- Adeyeye, O. O., Ogunleye, O. O., Coker, A., Kuyinu, Y., Bamisile, R. T., Ekrikpo, U., & Onadeko, B. (2014). Factors influencing quality of life and predictors of low quality of life scores in patients on treatment for pulmonary tuberculosis: a cross sectional study. *Journal of Public Health in Africa*, 5(2).
- Jaber AAS, Khan AH, Syed Sulaiman SA, Ahmad N, Anaam MS (2016). Evaluation of Health-Related Quality of Life among Tuberculosis Patients in Two Cities in Yemen. *PLoS ONE* 11(6): <https://doi.org/10.1371/journal.pone.0156258>
- Broadbent, E., Wilkes, C., Koschwanez, H., Weinman, J., Norton, S., & Petrie, K. J. (2015). A systematic review and meta-analysis of the Brief Illness Perception Questionnaire. *Psychology & health*, 30(11), 1361-1385.
- Brooks, S.K., & Dunn, R. (2016). Social and occupational factors associated with psychological distress and disorder among disaster responders: a systematic review. *BMC Psychol*. 4(18).
- Brown, J., Capocci, S., Smith, C., Morris, S., Abubakar, I., & Lipman, M. (2015). Health status and quality of life in tuberculosis. *International Journal of Infectious Diseases*, 32, 68-75.
- Centis, R., & Migliori, G.B. (2015). Tuberculosis treatment and drug regimens. *Cold Spring*

Harb Perspect Med. 5(5), a017822.

- Chen, B., Peng, Y., Zhou, L., Chai, C., Yeh, H. C., Chen, S., ... & Wang, X. (2016). Social support received by multidrug-resistant tuberculosis patients and related factors: a cross-sectional study in Zhejiang Province, People's Republic of China. *Patient preference and adherence*, 10, 1063.
- Creswell, J., Raviglione, M., Ottmani, S., Migliori, G. B., Uplekar, M., Blanc, L., ... & Lönnroth, K. (2011). Tuberculosis and noncommunicable diseases: neglected links and missed opportunities. *European Respiratory Journal*, 37(5), 1269-1282.
- Dalgard, O. S., Bj, S., & Tambs, K. (1995). Social support, negative life events and mental health. *The British Journal of Psychiatry*, 166(1), 29-34.
- Deshmukh, R. D., Dhande, D. J., Sachdeva, K. S., Sreenivas, A. N., Kumar, A. M., & Parmar, M. (2018). Social support a key factor for adherence to multidrug-resistant tuberculosis treatment. *Indian Journal of Tuberculosis*, 65(1), 41-47.
- Geofrey, S. (2020). *Factors Influencing Tuberculosis Treatment Outcomes in HIV Positive and HIV Negative Patients in Surabaya, Indonesia* (Doctoral dissertation, UNIVERSITAS AIRLANGGA).
- Global Tuberculosis Report (2020). *Geneva: World Health Organization*. Licence: CC BY-NC-SA 3.0 IGO.
- Halimah, E., & Diantini A, (2013). Antibiotic resistance in sepsis patients: Evaluation and recommendation of antibiotic use. *J Med Sci*, 5, 344-352
- Javed, S. (2016). Effect of education on quality of life and wellbeing. *International Journal Indian Psychol.* 3, 1–10.
- Jelsma, J., & Mlambo, T. (2018). A systematic review of the psychometric properties of the cross-cultural translations and adaptations of the Multidimensional Perceived Social

- Support Scale (MSPSS). *Health Quality Life Outcomes*.16, 1–19. doi: 10.1186/s12955-018-0912-0.
- Kakhki, A. D., & Masjedi, M. R. (2015). Factors associated with health-related quality of life in tuberculosis patients referred to the national research institute of tuberculosis and lung disease in Tehran. *Tuberculosis and respiratory diseases*, 78(4), 309.
- Keshavjee, S., Sweeney, C., Yedilbayev, A., Taran, D., Solovyova, A., & Gelmanova, I. The Sputnik Initiative: Patient-centered accompaniment for tuberculosis in Russia. *PIH Reports* 2014. 1(2)
- Khan, S., Tangiisuran, B., Imtiaz, A., & Zainal, H. (2017). Health status and quality of life in tuberculosis: systematic review of study design, instruments, measuring properties and outcomes. *Health Science Journal*, 11(1), 0-0.
- Khanna, D., & Tsevat, J. (2007). Health-related quality of life-an introduction. *American Journal of Managed Care*, 13(9), S218.
- Lawn, S. D., Meintjes, G., McIlleron, H., Harries, A. D., & Wood, R. (2013). Management of HIV-associated tuberculosis in resource-limited settings: a state-of-the-art review. *BMC medicine*, 11(1), 1-16.
- Lee, C., Dickson, D. A., Conley, C. S., & Holmbeck, G. N. (2014). A closer look at self-esteem, perceived social support, and coping strategy: A prospective study of depressive symptomatology across the transition to college. *Journal of Social and Clinical Psychology*, 33(6), 560.
- Liefooghe, R., Michiels, N., Habib, S., Moran, M. B., & De Muynck, A. (1995). Perception and social consequences of tuberculosis: a focus group study of tuberculosis patients in Sialkot, Pakistan. *Social science & medicine*, 41(12), 1685-1692.
- Louw, J., Peltzer, K., Naidoo, P., Matseke, G., Mchunu, G., & Tutshana, B. (2012). Quality of

- life among tuberculosis (TB), TB retreatment and/or TB-HIV co-infected primary public health care patients in three districts in South Africa. *Health and quality of life outcomes, 10*(1), 1-8.
- MacNeil, A., Glaziou, P., Sismanidis, C., Maloney, S., & Floyd, K. (2019). Global epidemiology of tuberculosis and progress toward achieving global targets—2017. *Morbidity and Mortality Weekly Report, 68*(11), 263.
- Malik, M., Nasir, R., & Hussain, A. (2018). Health related quality of life among TB patients: question mark on performance of TB DOTS in Pakistan. *Journal of tropical medicine, 2018*.
- Manches, O., Frleta, D., & Bhardwaj, N. (2014). Dendritic cells in progression and pathology of HIV infection. *Trends in immunology, 35*(3), 114-122.
- Masumoto, S., Yamamoto, T., Ohkado, A., Yoshimatsu, S., Querri, A. G., & Kamiya, Y. (2014). Prevalence and associated factors of depressive state among pulmonary tuberculosis patients in Manila, The Philippines. *The International journal of tuberculosis and lung disease, 18*(2), 174-179.
- Mirza, I., & Jenkins, R. (2004). Risk factors, prevalence, and treatment of anxiety and depressive disorders in Pakistan: systematic review. *Bmj, 328*(7443), 794.
- Mohammed, A., & Coker, A.O. (2011). Psychological distress and psychiatric symptoms among patients receiving treatment for tuberculosis in a Teaching Hospital in Lagos, Nigeria. *Journal of Community Medicine & Public Health., 23*, 1–2
- Nilima, A.R., & Shilpa D.M. (2017). A cross-sectional study to assess the stigma associated with tuberculosis among tuberculosis patients in Udupi district, Karnataka. *Indian Journal of Tuberculosis, 64*(4), 323–326
- Nirmal, A., Kuzmik, A., Sznajder, K., Lengerich, E., Fredrick, N. B., Chen, M., ... & Shaikh, B.

- (2022). 'If not for this support, I would have left the treatment!': Qualitative study exploring the role of social support on medication adherence among pulmonary tuberculosis patients in Western India. *Global Public Health*, 17(9), 1945-1957.
- Ogunyemi, A. O., Odeyemi, K. A., Kanma-Okafor, O. J., & Ladi-Akinyemi, T. W. (2018). Health-Related Quality of Life of the Elderly in Institutional Care and Non-Institutional Care in Southwestern Nigeria: A Comparative Study. *West African journal of medicine*, 35(1), 25-32.
- Paz-Soldán, V. A., Alban, R. E., Jones, C. D., & Oberhelman, R. A. (2013). The provision of and need for social support among adult and pediatric patients with tuberculosis in Lima, Peru: a qualitative study. *BMC health services research*, 13(1), 1-12.
- Poots, A., & Cassidy, T. (2020). Academic expectation, self-compassion, psychological capital, social support and student wellbeing. *International Journal of Educational Research*, 99, 101506.
- Qureshi, H., Bile, K. M., Jooma, R., Alam, S. E., & Afrid, H. U. R. (2010). Prevalence of hepatitis B and C viral infections in Pakistan: findings of a national survey appealing for effective prevention and control measures. *EMHJ-Eastern Mediterranean Health Journal*, 16 (Supp.), 15-23, 2010.
- Rahman, A., Iqbal, Z., Waheed, W., & Hussain, N. (2003). Translation and cultural adaptation of health questionnaires. *Journal-Pakistan Medical Association*, 53(4), 142-146.
- Saleem, S., A Malik, A., Ghulam, A., Ahmed, J., & Hussain, H. (2018). Health-related quality of life among pulmonary tuberculosis patients in Pakistan. *Quality of Life Research*, 27(12), 3137-3143.
- Saqib, S. E., Ahmad, M. M., & Panezai, S. (2019). Care and social support from family and community in patients with pulmonary tuberculosis in Pakistan. *Family medicine and*

- community health*, 7(4).
- Sawyer, A. T., Harris, S. L., & Koenig, H. G. (2019). Illness perception and high readmission health outcomes. *Health psychology open*, 6(1), 2055102919844504.
- Sharpe, L., & Curran, L. (2006). Understanding the process of adjustment to illness. *Social science & medicine*, 62(5), 1153-1166.
- Shiratani, K. N. (2019). Psychological changes and associated factors among patients with tuberculosis who received directly observed treatment short-course in metropolitan areas of Japan: quantitative and qualitative perspectives. *BMC Public Health*, 19(1), 1-12.
- Sofian, M., Zarinfar, N., & Mirzaee, M. (2009). Epidemiology of tuberculosis in Arak, Iran. *Koomesh*, 10(4), 261-266.
- Sulehri, M. A., Dogar, I. A., Sohail, H., Mehdi, Z., Azam, M., Niaz, O., & Iqbal, Z. (2010). Prevalence of depression among tuberculosis patients. *Annals of Punjab Medical College (APMC)*, 4(2), 133-137.
- Suleiman, M.M., & Sahal N. (2012). Tuberculosis stigma and discrimination worldwide: literature review. *African Public Health Journal*, 11-23.
- Thomas, B. E., Shanmugam, P., Malaisamy, M., Ovung, S., Suresh, C., Subbaraman, R., ... & Nagarajan, K. (2016). Psycho-socio-economic issues challenging multidrug resistant tuberculosis patients: a systematic review. *PloS one*, 11(1), e0147397.
- Vahedi, S. (2010). World Health Organization Quality-of-Life Scale (WHOQOL-BREF): analyses of their item response theory properties based on the graded responses model. *Iranian journal of psychiatry*, 5(4), 140.
- Wilcox, S. (2010). Multidimensional scale of perceived social support. *Psychological Trauma: Theory, Research, Practice, and Policy*, 2(3), 175-82.
- Williams, G., Alarcon, E., Jittimanee, S., Walusimbi, M., Sebek, M., & Berga, E. (2017). Best

practice for the care of patients with tuberculosis: a guide for low-income countries. *Paris, France: International Union Against Tuberculosis and Lung Disease.*