

## Investigating Health-related Depression and Quality of Life among Patients Afflicted with Tuberculosis in Bandar Lengeh

PoonehYousefi<sup>1,2</sup>, Hossein Heshmati<sup>2,\*</sup>, Rozita Heshmati<sup>2</sup>, Fahimeh Farzad<sup>3</sup>, Amir Ebrahimi<sup>3</sup>

<sup>1</sup> Social determinants in health promotion research center, Hormozgan university of medical sciences, Bandar Abbas, Iran

<sup>2</sup> Student research committee, Hormozgan University of medical sciences, Bandar Abbas, Iran

<sup>3</sup> Bahonar University of Kerman, Iran

\*Corresponding author: Hossein Heshmati, Student research committee, Hormozgan University of medical sciences, Bandar Abbas, Iran; Email: heshmati.hos@gmail.com; Tel: +989179530136.

### Abstract

**Introduction and aims:** Such chronic diseases as tuberculosis have short term and long term effects on patients' quality of life. Due to the hazardous consequences of disrupted quality of life, the present research aims to examine the quality of life along with the intensity of depression in patients suffering from tuberculosis hospitalized in Bandar Lengeh's hospitals.

**Methods:** The present research was a cross-sectional, descriptive study conducted on patients suffering from tuberculosis who visited hospitals and the healthcare system in Bandar Lengeh in 2015. Census was the sampling method and 30 patients entered the study accordingly. In order to collect the data, demographic information questionnaire was used along with the Persian version of sf36 and Beck Depression Inventory. The collected data were analyzed using tests of correlation, independent-sample t-test as well as ANOVA.

**Results:** 30 patients afflicted with tuberculosis whose average age was 38.0±14.1 years participated in this study. 53.3% of this sample were male while 46.7% were female. The range of the achieved scores was 59.70±21.69 for vitality domain and was 20.16±77.46 for the mental components. The total mean score of the quality of life was reported to be higher among men than women and was also higher among the single as compared to the married. According to Spearman test a significant negative correlation was found between the quality of life and patients' depression ( $r=-.722$ ). However, no statistically significant difference was reported ( $p>0.05$ ). Statistical tests managed to find a significant negative correlation between these patients' age and education level. No other significant correlation was found between the other variables in this study and the quality of life. Nevertheless, a significant negative correlation was observed between these patients' quality of life and depression.

**Conclusions:** Tuberculosis affects different aspects of depression and the quality of life such as the physical, functional, contextual, ideological and moral aspects. Attending to these differences and the influential factors is essential in order to use healthcare programs to promote the quality of patients' life. Effective healthcare services currently provided not only help to improve the disease and its symptoms but also improve different aspects of patients' life which further highlights the importance of curing this disease.

**Keywords:** Quality of life, Depression, Tuberculosis

### Introduction

Tuberculosis is a main cause of mortality among human beings worldwide (1). This disease is associated with malnutrition, poverty, overpopulation, unstandardized accommodation and inadequate healthcare provision. The affliction rate and the rate of mortality caused by this disease is on the rise (2). It is, therefore, considered among the 10 primary causes of death worldwide (3). The highest occurrence rate of this disease belongs to South-east Asia which accounts for one-third of the global prevalence (4). About 60% of affliction with tuberculosis and the mortality induced by that occur among men. Yet, the disease is also prevalent among women too (5).

In 1993, WHO called tuberculosis 'the global healthcare emergency' (2). However, according to the result of WHO's monitoring in 2014, this disease showed to be gradually decreased. According to reports made by WHO, if not controlled, the rate of this disease will reach a billion cases in 2000-20 and will lead to 35 millions of mortalities (1). However, due to the controls in 2014, a report by WHO is indicative of a globally decreasing prevalence rate. It is estimated that in 2000-13, 37 million lives were saved by effective diagnosis and treatment. The treatment rate of this disease has reached over 86% of all tuberculosis cases. Despite the fact that the majority of mortalities caused by this disease are preventable, still there is a high mortality rate of tuberculosis (5).

Due to the geographical status of Iran and its shared borders with such countries as Afghanistan and

Pakistan which are considered among the most polluted regions in the world, the risk of affliction with tuberculosis is high in Iran. Figures have it that the pollution rate in Iran is 17.9% and the occurrence of this disease is 37% per 1000 people. This ranks the 17<sup>th</sup> in the world (6). In 2011, the occurrence rate of this disease was 14.6 per 100,000 people (7). Currently, over 20 millions of people suffer from tuberculosis (8).

Chronic diseases including tuberculosis tremendously affect mental, welfare and physical aspects of patients' lives (5). Long term and short term effects threaten patients' quality of life. Their income is decreased and family lives get disrupted soon afterwards (4).

Profound effects of such chronic diseases as tuberculosis are due to the fact that they target all aspects of people's lives including mental, economic and social lives (9). Effects of tuberculosis are not confined to time and face the patient with many challenges including: pressures induced by controlling and treating the disease, following long and costly healthcare and therapeutic programs, hazardous side-effects of drugs, socially face-threatening consequences of affliction, probability of children's affliction, conduction of different tests, disrupted social and familial life, sexual problems, occupational problems and so on. These all help to lower the quality of these patients' lives (10). Quality of life has been associated with different factors such as one's physical and mental status, one's individual autonomy, social communications and contextual factors (11).

According to research findings, tuberculosis negatively affects one's perceived physical, mental and social health (12). Diagnosing tuberculosis can lead to depression and anxiety (13). Mental disorder indicates that those afflicted with tuberculosis also suffer from low self-confidence, negative perception of one's disease, lack of communication with community and family members (13). An investigation revealed that tuberculosis and attempts to cure it significantly affect multiple aspects of patients' quality of life. These effects are such that they continue even long after the disease has been treated (12).

Findings of an investigation conducted in Imam Khomeini Hospital in Tehran showed that those suffering from tuberculosis are among the most

vulnerable and poor members of society (11). This has led to one's unemployment and dismissal from job during one's disease which has in its own turn seriously affected patients' quality of life (14).

Financial costs associated with this disease along with the anxiety of afflicting others can disrupt one's psychological health (9). Such negative perceptions are generally reduced in the course of a successful therapy (15). Patients are afraid of informing their employers of their disease and losing their career or income (16). Having to take care of a family member suffering from tuberculosis at home is too much of a workload especially for a mother or a spouse. This would impede them from working outside, earning a living and taking care of other family members (17).

Moreover, patients are obliged to spend their savings, borrow money or even sell a property (17). They might even choose to get back to their job instead of continuing their therapy due to financial problems (18). Sexual effects of tuberculosis are well-known and has caused serious problems for young men and women. In many of the cases diagnosed, this disease has ended in divorce or remarriage (19, 20). Patients visiting tuberculosis clinics refrain from giving their right address in the fear that all their family members' face is threatened (18). Even after a successful and ensuring treatment, some patients continue to refrain from visiting relatives and informing them of their diagnosis (15).

Besides mental problems, physiological and social problems such as age, education, income and awareness are among factors influencing the quality of life of patients suffering from tuberculosis. The younger the individual is and the higher his/her education, income and awareness, the sooner s/he gets back to social activities, flexibilities and the more motivated s/he is for self-care. This would raise one's power of standing against problems in life and raise the quality of one's life (11, 13, 19). Improving one's quality of life plays a key role in accepting one's disease, treatments and the provided healthcare as well as resisting against the problems induced by this disease (13).

Considering the fact that tuberculosis is absolutely curable today and the status of patients suffering from this disease has been less explored in Hormozgan, the present research intended to use sf36 to examine the effect of this disease on

patients' quality of life. The ultimate goal was to promote the quality of life of these patients.

## Methods

The present research was a descriptive, cross-sectional study conducted on patients suffering from tuberculosis who went to Bandar Lengeh hospitals and healthcare centers. Census was the sampling method through which all patients afflicted with tuberculosis whose names had been registered in the epidemiologic department of the county's healthcare system in 2011-15 entered the study. Participants' age ranged from 19-65 years and all had passed the 25-day treatment course as well as the complete antibiotic diet. Patients who did not consent to take part as well as those whose names were registered but had passed away were excluded. To collect the data, after a phone call, the purpose of the research was made known to patients and in case they consented to participate, they were asked the items within the questionnaire. The questionnaire on respondent's demographic information was comprised of six phrases concerning age, gender, marriage status, education, income and occupation. In order to examine health-related quality of life, SF36 questionnaire was used. Its 36 items assessed health-related quality of life in two main parts, physical and mental. 8 domains were explored: physical function (10 items), social function (2 items), physical role (4 items), emotional role (3 items), mental health (5 items), vitality (4 items), bodily pain (2 items) and general health (5 items). In this questionnaire, each statement is to be rated. Each item has at least 2 and at most 6 choices. Each choice is on a 0-100 scale. 0 and 100 respectively show the minimum and maximum level of performance. The quality of life in each domain

ranges from 0 (lowest rate of the quality of life) to 100 (highest rate of the quality of life). The lower one's score, the lower the health-related quality of life.

Beck Standardized inventory was used to assess depression. This questionnaire was comprised of 21 items each comprised of 4 phrases. Each phrase indicates a state which can be rated from 0 to 3. These scores can be then added up and the final score is to be judged upon. If the score ranges between 1 and 10, one is decided to be normal and without depression. In case the score lies between 11 and 16, one is considered to be mildly depressed.

The score range of 17-20 indicates the need for consulting a psychologist or psychiatrist. 21-30 implies that one is depressed. Intense depression is revealed by a score ranging from 31 to 40, and finally a score above 40 is a sign of severe depression. .

Reliability and validity of the Persian-translated version of sf36 were confirmed as a standardized questionnaire by the medical research center of Jihad Daneshgahi (Montazeri et al.) (20). The reliability and validity of Beck Depression Inventory have been already established in a body of Iranian research (21).

Having collected the data through phone-call interviews and questionnaire completion, the target data entered SPSS (version 18). Statistics of central tendency and distribution, correlation coefficient, multivariate regression, Mann-Whitney U-test and Kruskal Wallis were used to analyze the data to meet the primary and secondary goals of the research.

## Results

30 patients afflicted with tuberculosis whose average age was  $38 \pm 14.1$  participated in this study. Table 1 indicates their distribution in terms of age, gender, marital status, education, income and occupation. The overall score for the quality of life was  $2769.00 \pm 847.41$  for men and  $2567.57 \pm 835.20$  for women. This confirms the fact that the quality of life is higher among men than women in this study. The overall score for the quality of life among the single was estimated to be  $2737.75 \pm 1364.94$  and among the married was  $2665.34 \pm 762.51$ . However, the statistical t-test found no significant difference between gender and marital status in terms of the quality of life. The mean score for each dimension of the health-related quality of life is listed in table 2.

**Table 1:** Patient characteristics or participants characteristics or demographic information of participants

	Variable	Frequency	%
<b>Gender</b>	Male	16	53.3
	Female	14	46.7
<b>Marital status</b>	Single	4	13.3
	Married	26	86.7
<b>Education</b>	uneducated	17	56.7
	Elementary school	7	23.3
	school-junior high school		
	diploma	6	20
<b>Occupation</b>	worker	7	23.3
	freelance	8	26.7
	Housewife	14	46.7
	Official work	1	3.3
<b>Income</b>	$\leq 500$ thousand tomans	28	93.3
	500-1000 thousand tomans	2	6.7

**Table 2:** Mean and standard deviation of the 8 subscales of sf36 among tuberculosis patients studied in 2011-15 in Bandar Lengeh.

Dimension	Standard deviation (SD)
<b>Physical functioning</b>	$76.83 \pm 27.49$
<b>Physical role functioning</b>	$75 \pm 35.95$
<b>Bodily pain</b>	$73.16 \pm 29.82$
<b>General health</b>	$74 \pm 29.10$
<b>Vitality</b>	$59.70 \pm 21.69$
<b>Social functioning</b>	$76.66 \pm 33.75$
<b>Social role functioning</b>	$75.55 \pm 42.82$
<b>Mental health</b>	$77.46 \pm 20.16$

Kruskal Wallis test was run to test the difference between education, employment, marital status, income on the one hand and physical functioning, physical role functioning, bodily pain, general health, vitality, social functioning, social role functioning and mental health, on the other. However, no statistically significance was found. The mean depression score was estimated to be  $6.6 \pm 9.76$  among patient participants. Spearman test estimated a statistically significant negative correlation between the quality of life and depression ( $r=0.722$ ). To be more precise, the higher the level of depression, the lower one's quality of life. Moreover, in case depression is investigated along each of the 8 dimensions of the quality of life, a significant negative correlation is found between depression and physical functioning ( $r=0.591$ ), social role functioning ( $r=0.672$ ), bodily pain ( $r=0.586$ ), general health ( $r=0.443$ ), social functioning ( $r=0.534$ ), social role functioning ( $r=0.686$ ) and mental health ( $r=0.83$ ). However, no statistically significant correlation was found between vitality and depression.

**Table 3:** Frequency of individuals according to Beck inventory

Level	Percentage (%)	Frequency (f)
Normal	%80	24
Minor depression	%6.7	2
Need for consultation	%3.3	1
To some extent depressed	%6.7	2
Profoundly depressed	%3.3	1

## Discussion

Affliction with a chronic disease such as tuberculosis not only affects one's physical health but also affects social and mental aspects of one's life (27). The findings of the present research looked into the dimensions of the quality of life and how they were affected by depression among those afflicted with tuberculosis. The lowest score of the quality of life belonged respectively to vitality, bodily pain, physical role functioning and social role functioning. The highest score respectively belonged to mental health, physical functioning, social functioning and general health.

The present research shows that the highest effects of tuberculosis were on vitality, bodily pain and general health, respectively. Moreover, the highest score of the quality of life pertains to the mental component. In Hansell et al.'s study (2004) in which the data were gathered qualitatively through focused group discussion from patients and service providers, from women and men separately about the effect of the disease on different aspects of the quality of life, it was revealed that tuberculosis affects sexual and moral aspects of their lives as perceived by patients. However, the disease was found to affect general health, physical and mental health, social and physical functioning both as perceived by both patients and service providers (14).

In Kakhki et al.'s investigation (2006), the lowest score of the quality of life was concerned with

physical role functioning, vitality and emotional role functioning (28). The present research, however, revealed that the foremost effects of tuberculosis were respectively on vitality, bodily pain and physical role functioning dimensions.

The highest score of the quality of life was found to belong to mental health. It seems fewer problems concerning this dimension has to do with local beliefs and cultural conditions. The lowest score of the quality of life was attributed to vitality which seems to be rooted in families' financial problems and low income. According to the findings of the present research, about 93% of the participants' income was less than 500 thousand tomans per month. However, no statistically significant result was found concerning this issue.

In the present research, the mean score of the quality of life among men was higher than women. This finding is consistent with the findings of a body of research including those conducted by Analan et al. (2008) and Dhuria et al. (2008). Moreover, in investigations of the quality of life among patients suffering from other diseases such as asthma or cardiovascular diseases, a similar higher quality of life was witnessed among men than women (29). In an investigation conducted in Turkey entitled as the correlation of the quality of life and personal features of patients suffering from tuberculosis, the life quality score was higher among women than men, though not statistically significant (30).

One reason why the quality of life among men was found to be higher than women in the present study could be men's more social contacts. Due to the specific cultural limits in this region of the country, women are socializing less. This can add to their emotional problems especially after affliction with tuberculosis. A number of studies revealed that the social consequences of tuberculosis were more among women (31).

In the present research, the mean score of the quality of life was found to be higher among the single than the married. However, no statistical significance could be attached to it. In Doyan et al.'s research (2005) entitled as the correlation of the quality of life and personal features of patients afflicted with tuberculosis in Turkey, the life quality score was found to be higher among the married and the single than the divorced. However, this relation was not statistically significant (30).

Moreover, in the study conducted by Robabi et al. (2012), life quality score was estimated to be higher among the single than the married or widows. This relation was also statistically significant (29).

The single are typically younger than others and generally enjoy a better quality of life. Why the mean score of their quality of life is higher could be for the same reason.

Spearman statistical test ( $r=0.722$ ) revealed a statistically significant negative correlation between the life quality related findings and depression among patients suffering from tuberculosis. The lower their quality of life, the more depressed they are. Other studies on similar topics also found a negative correlation between the quality of life and depression. A study conducted by Nicholson et al. in the U.S. entitled as the signs of depression and

health-related quality of life during pregnancy indicated that the quality of life of women with signs of depression was significantly lower than those without any such sign (32).

The findings of the present research show that despite many effective treatments and care against tuberculosis today, patients are privileged with a desirable quality of life. The mean depression score is acceptable among the majority of them. Moreover, the present findings revealed a negative correlation between the quality of life and depression among patients afflicted with tuberculosis. Therefore, any attempt to promote their quality of life is worth considering since their low quality of life is accompanied by a rise of risk-taking and emergence of depression among these people.

**Table 4:** Features and comparison of probable factors among groups in terms of depression

Study group		Depressed		Not depressed	
variable		f.	%	f.	%
gender	Male	2	%12.50	14	%87.50
	female	4	%28.57	10	%71.42
Marital status	Married	6	%23.7	20	%76.92
	single	0	%0	4	%100
Education	Uneducated	4	%23.52	13	%76.47
	Elementary/junior high school	2	%28.57	5	%71.42
	diploma	0	%0	6	%100
income	≤500 thousand tomans	6	%21.42	22	%78.57
	500-1000 thousand tomans	0	%0	2	%100
occupation	Worker	1	%14.28	6	%85.71
	Freelance	1	%12.5	7	%87.50
	Housewife	4	%28.57	10	%71.42
	other	6	%85.71	1	%14.28

## Acknowledgement

Hereby, we should like to express gratitude towards all professors and the staff of the tuberculosis treatment center of Bandar Lengeh's healthcare network. Special thanks go to Mr. Alvandi and the patient participants of this study.

## Conflicts of interest

Authors declare no conflict of interests.

## References

- Dye C, Scheele S, Dolin P, Pathania V, Raviglione MC. Global burden of tuberculosis: estimated incidence, prevalence, and mortality by country. *Jama*. 1999;282(7):677-86.
- L J, CNRN HPR, H K, RN C. Surgical Nursing Brunner Svdsars. Tehran: jame negar 280 .1391 ;p.
- Dye C, Bassili A, Bierrenbach A, Broekmans J, Chadha V, Glaziou P, et al. Measuring tuberculosis burden, trends, and the impact of control programmes. *The Lancet infectious diseases*. 2008;8(4):233-43.
- Marzuki O, Fauzi A, Ayoub S, Kamarul Imran M. Prevalence and risk factors of anti-tuberculosis drug-induced hepatitis in Malaysia. *Singapore medical journal*. 2008;49(9):688.
- Organization WH. Global Tuberculosis report. 2014.
- Yosef Tz, ali IFA. Check environmental factors and underlying causes tuberculosis.
- Farazi A, Sofian M, Jabbariasl M. Improving the quality of life in tuberculosis patients with N-acetylcysteine. *Arak Medical University Journal*. 2014;17(3):47-55.
- Organization WH. Global Tuberculosis report. 2013.
- AggarwalAN. Health-related quality of life: A neglected aspect of pulmonary tuberculosis. *Lung India: official organ of Indian Chest Society*. 2010;27(1):1.
- Graue M, Wentzel-Larsen T, Hanestad B, Båtsvik B, Sjøvik O. Measuring self-reported, health-related, quality of life in adolescents with type 1 diabetes using both generic and disease-specific instruments. *Acta Paediatrica*. 2003;92(10):1190-6.
- Ramin Hf, Shirin A, Mehrnaz rn, Azita K, Javad HsS, Samira M, et al. Assess the impact of anti-TB treatment on the health quality of life of patients with tuberculosis hospitalized in Imam Khomeini Hospital.
- Guo N, Marra F, Marra CA. Measuring health-related quality of life in tuberculosis: a systematic. *Health and quality of life outcomes*. 2009;7:14.
- Sule AG, Odeigah LO, Alabi KM, Issa BA, Shittu RO, Joseph Al, et al. Quality of Life of Patients with Tuberculosis in a Nigerian Teaching Hospital. *Turkish Journal of Family Medicine & Primary Care*. 2014;8(2):39-47.
- Hansel NN, Wu AW, Chang B, Diette GB. Quality of life in tuberculosis: patient and provider perspectives. *Quality of life research*. 2004;13(3):639-52.
- Rajeswari R, Muniyandi M, Balasubramanian R, Narayanan P. Perceptions of tuberculosis patients about their physical, mental and social well-being: a field report from south India. *Social science & medicine*. 2005;60(8):1845-53.
- Johanson E, Piwan V, Huong N, Ahlberg B. Staff and patient attitudes to tuberculosis and compliance with treatment. *Tubercle and Lung Disease*. 1996;77:178-83.
- Kamolratanakul P, Sawert H, Kongsin S, Lertmaharit S, Sriwongsa J, Na-Songkhla S, et al. Economic impact of tuberculosis at the household level. *The International Journal of Tuberculosis and Lung Disease*. 1999;3(7):596-602.
- Barnhoorn F, Adriaanse H. In search of factors responsible for noncompliance among tuberculosis patients in Wardha District, India. *Social science & medicine*. 1992;34(3):291-306.
- Marra CA, Marra F, Cox VC, Palepu A, Fitzgerald JM. Factors influencing quality of life in patients with active tuberculosis. *Health and quality of life outcomes*. 2004;2(1):58.
- Kelly-Rossini L, Perlman DC, Mason DJ. The experience of respiratory isolation for HIV-infected persons with tuberculosis. *Journal of the Association of Nurses in AIDS Care*. 36-29:(1)7;1996 .
- Khan A, Walley J, Newell J, Imdad N. Tuberculosis in Pakistan: socio-cultural constraints and opportunities in treatment. *Social Science & Medicine*. 2000;50(2):247-54.
- Liefvooghe R, Michiels N, Habib S, Moran M, De Muynck A. Perception and social consequences of tuberculosis: a focus group study of tuberculosis patients in Sialkot, Pakistan. *Social Science & Medicine*. 1995;41(12):1685-92.
- Ali DP, Jila A, Mohammadreza M, Hasan A .
- Quality of life of diabetic patients with tuberculosis patients. *Knowledge and health*. 8(2):71-5.
- King IM. Quality of life and goal attainment. *Nursing Science Quarterly*. 1994;7(1):29-32.
- Montazeri A, GOSHTASBI A, Vahdaninia M. The short form health survey (SF-36): Translation and validation study of the Iranian version. 2006.
- Endres S, Ghorbani R, Kelley VE, Georgilis K, Lonnemann G, van der Meer JW, et al. The effect of dietary supplementation with n-3 polyunsaturated fatty acids on the synthesis of interleukin-1 and tumor necrosis factor by mononuclear cells. *New England Journal of Medicine*. 1989;320(5):265-71.
- Aggarwal AN. Health-related quality of life: A neglected aspect of pulmonary tuberculosis. *Lung india*. 2010;27(1):1.
- Darvishpur A, Etaati Z, Mirsaidi S, Masgedi M, Valayati A. Quality of life in tuberculosis Patient Referred the

- Masih Daneshvari Hospital. Iranian Journal of Infectious Diseases. 2006;11(32):49-56.
30. Navidian, Robabi, Mofred P. Quality of life in patients with pulmonary tuberculosis during treatment. Journal of Mazandaran University of Medical Sciences. 2012;22(93):112-22.
  31. Esmaili Z, ZIABAKHSH TS, Vaezzadeh N, MOHAMMADPOUR TR. Quality of life after coronary artery bypass grafting in Sari city, 2005-2006. 2007.
  32. Long NH, Johansson E, Diwan VK, Winkvist A. Fear and social isolation as consequences of tuberculosis in VietNam: a gender analysis. Health policy. 2001;58(1):69-81.
  33. Nicholson WK, Setse R, Hill-Briggs F, Cooper LA, Strobino D, Powe NR. Depressive symptoms and health-related quality of life in early pregnancy. Obstetrics&Gynecology. 2006;107(4):798-806.