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Factors Associated with Health-Related Quality of Life in Tuberculosis Patients Referred to the National Research Institute of Tuberculosis and Lung Disease in Tehran

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Background: In tuberculosis (TB) patients, health-related quality of life (HRQoL) is significant in self-management, which in turn can be effective in therapeutic acceptance and prevention of treatment failure due to multi-drug resistant TB. This study was conducted to evaluate HRQoL and associated factors in TB patients referred to the National Research Institute of Tuberculosis and Lung Disease (NRITLD).

Methods: In this study, patients were selected from TB clinics of the NRITLD in Tehran. In addition to an Iranian version of the Short-Form Health Survey (SF-36), demographic and disease characteristic questionnaires were used for data collection. The data were then analyzed using SPSS software.

Results: Two hundred five TB patients, with the average age of 42.33±17.64 years, participated in this study. The HRQoL scores in different domains ranged from 14.68±11.60 for role limitations due to emotional problems to 46.99±13.25 for general health perceptions. The variables of sex, marital status, education, job status, place of residence, and cigarette smoking, influenced the HRQoL scores in different dimensions.

Conclusion: According to the study findings are the important variables that influenced the HRQoL of TB patients. The consideration of its can improve the HRQoL of TB patients.

Keywords: Quality of Life; Tuberculosis; Health Status

Introduction

Tuberculosis (TB) remains a serious public health, social, and economic problem worldwide[1]. This disease is the second leading cause of death from an infectious disease across the world[2,3]. Early diagnosis and treatment are fundamental to controlling TB transmission[4-6]. The lack of adherence to TB treatment is one of the main factors determining its effectiveness, especially in low-income countries[7]. Despite the introduction of short-course treatment, poor adherence to TB treatment has led to falls in cure rates, increased transmission in the population, higher risk of acquiring multidrug resistance (MDR), increased mortality and increased cost of treatment for a patient with MDR[8].

A comprehensive understanding of barriers to and facilita-

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tors of poor TB treatment outcome is still lacking, and this is a major obstacle to finding effective solutions. The current TB program services and clinical research have focused on outcomes of mortality and microbiologic cure, and have neglected patients' preferences such as their perceived health-related quality of life (HRQoL), which may be crucial in influencing treatment outcome[9].

Many aspects of TB and its treatment can compromise patients' quality of life. Treatment of active TB requires prolonged therapy with multiple drugs that can lead to adverse reactions and concerns about costs and outcomes of TB. There is considerable social rejection by the immediate family and social stigma associated with TB, leaving the individual feeling shunned and isolated[1,10-12].

HRQoL involves assessing a person's perception of his or her physical and mental health[3]. Both physical and mental distress is common in TB patients leading to poor disease outcome or poor treatment outcome because of decreased ability to take treatment[4,5]. Knowing patients' HRQoL would enable program managers and clinicians to understand the functioning and well being of TB patients so that individual patient-specific needs are addressed to attain the best clinical or treatment outcome, and thus increasing the likelihood of adequate case management in TB programs[9].

There has been relatively little research on TB HRQoL and even less in developing countries. A better understanding may help improve treatment regimens, adherence to treatment, and functioning and well-being of people with TB. This study was conducted to evaluate HRQoL and associated factors in TB patients referred to the National Research Institute of Tuberculosis and Lung Disease (NRITLD) in Tehran, Iran.

Materials and Methods

1. Patients and methods

This descriptive study was conducted on 205 Pulmonary TB patients who were referred to NRITLD TB clinics in Tehran from December 2013 to March 2014. NRITLD holds a TB clinic at least every day. The researcher conducted the data collection in person every day. The inclusion criteria consisted of (1) the ability to speak and understand Persian (national language of Iran), (2) age between 18 to 65, (3) anti-TB treatment had been given for at least 15 days, (4) pulmonary TB patients with initial treatment that took first-line anti-TB drugs, and (5) having no other comorbidity, ex-pulmonary TB, and MDR-TB. A questionnaire was used to collect data on demographics and disease characteristics. An Iranian version of the 36-item Short-Form Health Survey (SF-36) was used[13]. The participants responded to a self-report questionnaire and provided demographic information on another questionnaire that included nine items on age, gender, marital status, education level, job status, living place, and cigarette smoking. The Iranian version of SF-36[13] was used to determine HRQoL among the TB patients. This scale was originally developed in the United States with established validity and reliability among a different group of patients[14]. The scale consists of 36 items with eight subscales: physical functioning (10 items), role limitations due to physical problems (4 items), bodily pain (2 items), general health perceptions (5 items), vitality (4 items), social functioning (2 items), role limitations due to emotional problems (3 items), and perceived mental health (5 items). In addition, the SF-36 has an item about health transition that is not part of any of the scales. Participant responses were coded, summed and transformed to a 0–100 scale, with higher scores indicating better physical and mental functioning and freedom from pain[15].

2. Statistical analysis

Data were analyzed by descriptive statistical tests (Spearman rank correlation coefficient and Mann Whitney, Kruskal Wallis, and least significant difference tests), using SPSS version 20 (SPSS Inc., Chicago, IL, USA).

3. Ethical considerations

Approval to conduct the study was confirmed by the Ethics Committee of Shahid Beheshti Medical University in Iran. All participants were assured of confidentiality, asked to sign an informed consent, and given informal instructions informing them they could refuse to answer any question or discontinue participation at any time.

Results

The 205 TB patients with mean age of 42.33±17.64 years responded to the demographic characteristics questionnaire as indicated in Table 1. Patients' overall scores on the SF-36 are displayed in Table 2. The lowest score was achieved on the role limitations due to emotional problems scale (mean±standard deviation [SD], 14.68±11.60) and the highest score was attained on the general health scale (mean±SD, 46.99±13.25).

The SF-36 subscale scores were influenced by characteristics marital status, education level, job status, living place, and cigarette smoking. There were significant correlations between education level and physical functioning, role limitations due to physical problems, bodily pain, and vitality (Table 3). The TB patients with primary and high school education attained better scores than illiterate TB patients.

There were significant correlations between job status and both role limitations due to physical problems and vitality (Table 3). The greatest difference of role limitations due to

Table 1. Demographic characteristics of tuberculosis patients

Variable	No. (%)
Sex	
Male	114 (55.6)
Female	91 (44.4)
Marital status	
Single	55 (26.8)
Married	140 (68.3)
Divorced	3 (1.5)
Widowed	7 (3.4)
Educational level	
Illiterate	137 (69.9)
Primary school	30 (15.4)
High school	29 (14.8)
Job status	
Employed	53 (26.1)
Unemployed	40 (19.7)
House-keeper	65 (32)
Retired	45 (22.2)
Residence	
Town	162 (79)
Village	43 (21)
Cigarette smoking	
Non-smoker	175 (86.6)
Smoker	27 (13.4)

physical problems was between individuals with employed status versus retired status and then between individuals with house-keeper status versus retired status and finally between individuals with unemployed status versus retired status. The greatest difference in vitality was between individuals with retired status versus employed status and then between individuals with unemployed status versus employed status and finally between individuals with house-keeper status versus employed status.

TB patients who lived in towns attained significantly higher scores on physical functioning and bodily pain than TB patients who lived in villages (Table 3). TB patients living in villages attained significantly higher scores on role limitations due to physical problems and role limitations due to emotional problems than TB patients living in towns (Table 3).

TB patients who never smoked attained significantly higher scores on social functioning than current smokers (Table 3).

Age had no significant correlations with domains of HRQoL.

Table 2. Means for eight subscales of SF-36

Dimension	Mean±SD
Physical functioning	39.97±25.84
Role limitations due to physical problems	19.77±9.14
Body pain	30.80±26.58
General health perceptions	46.99±13.25
Vitality	24.19±15.40
Social functioning	40.01±17.52
Role limitations due to emotional problems	14.68±11.60
Mental health	30.91±8.02

SF-36: Iranian version of the 36-item Short-Form Health Survey.

Discussion

The results revealed that TB has a remarkable impact on several dimensions of HRQoL for TB patients. These findings were similar to other studies[10,12,16,17]. Mean SF-36 scale scores for patients in this study ranged from 14.68 to 46.99 and were noticeably lower than in the study of Louw et al.[18], which may be due to the difference of environment study and pathology of TB disease. The effects were most noteworthy on role limitations due to emotional problems and the least so on general health perceptions, which confirms the results of other similar studies[17,19,20]. The decrease in vitality, fatigue, depression, weakness, chest pain, cough, limb pain, numbness and paresthesia of the limbs, and concerns regarding disease complications and prognosis of TB are common problems experienced by TB patients[11] and may be accompanied by a decrease in role limitations due to emotional problems. In some studies[16,21], physical health effects of TB have been prominent in comparison to its other manifestations. Therefore, special consideration of physical problems in TB patients may have a remarkable effect on improving HRQoL during treatment periods[12,20].

General health perceptions affected divorced patients more significantly than single and married patients. In other studies divorced patients attained lower quality of life and more problems than single and married patients as well, which may be due to more problems and a more negative view of community among divorced patients[22,23].

Some differences in physical functioning, role limitations due to physical problems, bodily pain, and vitality were found among TB patients with different education levels. The patients with primary and high school education showed significantly better physical functioning, role limitations due to physical problems, bodily pain, and vitality than illiterate patients, consistent with similar studies[18,24]. It's possible that education leads to more flexibility in life and impetus for self-care that would lead to a decrease in physical problems, increase vitality and improve physical functioning. On the other

Table 3. Mean values and p-values for eight subscales of SF-36, based on subgroups

	Physical functioning	Role limitations due to physical problems	Bodily pain	General health perceptions	Vitality	Social functioning	Role limitations due to emotional problems	Mental health
Marital status	-	-	-	p=0.001	-	-	-	-
Single	-	-	-	50.27	-	-	-	-
Married	-	-	-	46.69	-	-	-	-
Divorced	-	-	-	33.00	-	-	-	-
Educational level	p=0.000	p=0.000	p=0.018	-	p=0.000	-	-	-
Illiterate	34.31	14.34	27.10	-	19.58	-	-	-
Primary and high school	54.25	21.81	37.67	-	35.49	-	-	-
Job status	-	p=0.003	-	-	p=0.002	-	-	-
Employed	-	15.18	-	-	30.92	-	-	-
Unemployed	-	21.55	-	-	20.44	-	-	-
House-keeper	-	20.08	-	-	23.96	-	-	-
Retired	-	22.08	-	-	20.35	-	-	-
Residence	p= 0.014	p=0.046	p=0.000	-	-	-	p=0.003	-
Town	41.78	19.16	33.89	-	-	-	13.47	-
Village	33.21	21.95	19.99	-	-	-	18.99	-
Cigarette smoking	-	-	-	-	-	p=0.027	-	-
Non-smoker	-	-	-	-	-	41.31	-	-
Smoker	-	-	-	-	-	33.33	-	-

SF-36: Iranian version of the 36-item Short-Form Health Survey.

hand, education could lead to improvement in job status, social and financial matters, lower psychological distress and consequently well being and access to health services[18,25].

Some differences in role limitations due to physical problems and vitality were found among TB patients with different job statuses. This may be because having a job provides opportunity for more social participation, better social insurance coverage and income of TB patients[24,25]. It is possible that having a job can decrease a patient's attention to his/her disease and increase self-care vitality by focusing on his/her job. On the other hand, the employed persons have less time for doing of their roles especially because of negative effects of TB disease on their physical performance. It could be lead to decrease role limitations due to physical problems.

Rural TB patients had significantly low scores on physical functioning and bodily pain and better scores on role limitations due to physical problems and role limitations due to emotional problems than those who settled in towns. Since this issue had not been assessed in previous studies, further studies are required. It seems that lower HRQoL in TB patients who live in villages is affected by socioeconomic, cultural, and environmental factors in addition to difficult accessibility to appropriate treatment and health services. On the other hand, it seems that social stigma causes more impact on physical and emotional role limitations in urban TB patients[10].

Current TB smokers had lower social functioning than never smoker patients. Cigarette smoking can lead to decreased social function because of a negative view of others to cigarette smoking and harmful consequences for individual health, especially physical health, within the short or long run[25-27]. It could lead to better social functioning in never smoker TB patients than smokers.

We acknowledge our study has some limitations. One is the modest sample size due to time and cost constraints. Hence, we interpret the results with caution. A second limitation is that the study has no control group. In addition to limitation in time and cost, it is difficult finding a suitable control group for quality of life as a subjective phenomenon[28]. Thus, a comparison of the results of this study with a general population is not possible.

In conclusion, the results revealed that TB patients had low HRQoL. Thus, consideration of related factors can have an ef-

fective role in improving HRQoL in these patients. We suggest that further studies be performed for evaluating these factors and related care and treatment strategies for better health-related quality of life in TB patients.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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References

1. Chang B, Wu AW, Hansel NN, Diette GB. Quality of life in tuberculosis: a review of the English language literature. Qual Life Res 2004;13:1633-42.
2. Longo DL, Fauci AS, Kasper DL Hauser SL, Jameson JL, Loscalzo J. Harrison's principles of internal medicine. 18th ed. Philadelphia: Mc Grow-Hill Co.; 2011.
3. World Health Organization. Global tuberculosis report 2014. Geneva: World Health Organization; 2014.
4. Westaway MS, Wessie GM. Tuberculosis diagnosis and treatment of young South African children: experiences and perceptions of care-givers. Tuber Lung Dis 1994;75:70-4.
5. Liefooghe R, Michiels N, Habib S, Moran MB, De Muynck A. Perception and social consequences of tuberculosis: a focus group study of tuberculosis patients in Sialkot, Pakistan. Soc Sci Med 1995;41:1685-92.
6. World Health Organization. WHO report on the global tuberculosis epidemic 1998. Geneva: World Health Organization; 1998.
7. Homedes N, Ugalde A. Patients' compliance with medical treatment in the third world: what do we know? Bol Of Sanit Panam 1994;116:491-517.
8. Mateus-Solarte JC, Carvajal-Barona R. Factors predictive of adherence to tuberculosis treatment, Valle del Cauca, Colombia. Int J Tuberc Lung Dis 2008;12:520-6.
9. Babikako HM, Neuhauser D, Katamba A, Mupere E. Feasibility, reliability and validity of health-related quality of life questionnaire among adult pulmonary tuberculosis patients in urban Uganda: cross-sectional study. Health Qual Life Outcomes 2010;8:93.
10. Hansel NN, Wu AW, Chang B, Diette GB. Quality of life in tuberculosis: patient and provider perspectives. Qual Life Res 2004;13:639-52.
11. Marra CA, Marra F, Cox VC, Palepu A, Fitzgerald JM. Factors influencing quality of life in patients with active tuberculosis. Health Qual Life Outcomes 2004;2:58.
12. Deribew A, Deribe K, Reda AA, Tesfaye M, Hailmichael Y, Maja T, et al. Change in quality of life: a follow up study among patients with HIV infection with and without TB in Ethiopia. BMC Public Health 2013;13:408.
13. Montazeri A, Goshtasebi A, Vahdaninia M, Gandek B. The Short Form Health Survey (SF-36): translation and validation study of the Iranian version. Qual Life Res 2005;14:875-82.
14. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992;30:473-83.
15. McHorney CA, Ware JE Jr, Lu JF, Sherbourne CD. The MOS 36-item Short-Form Health Survey (SF-36): III. Tests of data quality, scaling assumptions, and reliability across diverse patient groups. Med Care 1994;32:40-66.
16. Chamla D. The assessment of patients' health-related quality of life during tuberculosis treatment in Wuhan, China. Int J Tuberc Lung Dis 2004;8:1100-6.
17. Fernandez-Plata Mdel R, Garcia-Sancho MC, Perez-Padilla JR. A case-control study of the impact of tuberculosis on the quality of life of patients. Rev Invest Clin 2011;63:39-45.
18. Louw J, Peltzer K, Naidoo P, Matseke G, McHunu G, Tutshana B. 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 Qual Life Outcomes 2012;10:77.
19. Dion MJ, Tousignant P, Bourbeau J, Menzies D, Schwartzman K. Feasibility and reliability of health-related quality of life measurements among tuberculosis patients. Qual Life Res 2004;13:653-65.
20. Deribew A, Deribe K, Reda AA, Tesfaye M, Hailmichael Y, Maja T. Do common mental disorders decline over time in TB/HIV co-infected and HIV patients without TB who are on antiretroviral treatment? BMC Psychiatry 2013;13:174.
21. Dowdy DW, Israel G, Vellozo V, Saraceni V, Cohn S, Cavalcante S, et al. Quality of life among people treated for tuberculosis and human immunodeficiency virus in Rio de Janeiro, Brazil. Int J Tuberc Lung Dis 2013;17:345-7.
22. Peltzer K, Naidoo P, Matseke G, Louw J, McHunu G, Tutshana B. Prevalence of psychological distress and associated factors in tuberculosis patients in public primary care clinics in South Africa. BMC Psychiatry 2012;12:89.
23. Darvishpoor Kakhki A, Abed Saeedi Z. Health-related quality of life of diabetic patients in tehran. Int J Endocrinol Metab 2013;11:e7945.
24. Duyan V, Kurt B, Aktas Z, Duyan GC, Kulkul DO. Relationship between quality of life and characteristics of patients hospitalised with tuberculosis. Int J Tuberc Lung Dis 2005;9:1361-6.
25. Kittikraisak W, Kingkaew P, Teerawattananon Y, Yothasamut J, Natesuwan S, Manosuthi W, et al. Health related quality of life

among patients with tuberculosis and HIV in Thailand. PLoS One 2012;7:e29775.
26. Wilson D, Parsons J, Wakefield M. The health-related quality-of-life of never smokers, ex-smokers, and light, moderate, and heavy smokers. Prev Med 1999;29:139-44.
27. Mulder I, Tijhuis M, Smit HA, Kromhout D. Smoking cessation and quality of life: the effect of amount of smoking and time since quitting. Prev Med 2001;33:653-60.
28. Bowling A. Measuring disease: a review of disease-specific quality of life measurement scales. 2nd ed. Oxford: Open University Press; 2001.