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HEALTH RELATED QUALITY OF LIFE AND DEPRESSION AMONG PULMONARY TUBERCULOSIS PATIENTS: A SYSTEMATIC REVIEW

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ABSTRACT

Background: Tuberculosis has been one of the leading causes of mortality and morbidity worldwide especially in the developing countries. With the emergence of new strategies for treatment and control, the focus of TB management has been shifted from mortality to disease related morbidity and patient reported quality of life. **Aim:** The aim of this review paper was to summarize the research findings related to assessment of health related quality of life and depression among pulmonary tuberculosis patients in developed and developing countries as well as Pakistan. **Methods**: A total of 48 published articles cited in ISI web of science, PubMed, Science direct and Google scholar regarding assessment of health related quality of life and depression among pulmonary tuberculosis patients were reviewed. The search terms used with each database were health related quality of life, pulmonary tuberculosis, and depression. **Results & Conclusion:** The review highlighted poor health related quality of life across all domains of health including physical, social and psychological health as well as moderate depression among patients of pulmonary tuberculosis in developed, developing countries as well as Pakistan. All

stakeholders must work together to devise strategies for improving all aspects of health needs of the patients including psychological, social and mental wellbeing which can lead to improved health seeking behavior and improved adherence to the TB therapy.

Keywords: Health related quality of life, depression, pulmonary tuberculosis, developed & developing countries, Pakistan

INTRODUCTION

Tuberculosis remains a serious public health and economic problem worldwide [1]. In year 2014, world health organization declared TB alongside with HIV Aids as a leading cause of death killing almost 1.5 million people globally and most of these deaths occurred in the developing world [2]. Though much focus has been given to clinical outcomes of therapy and microbiological cure but assessment of patient reported health related quality of life and disease related depression has been neglected. Tuberculosis can devastatingly affect patient's HRQoL due to its long duration of treatment, social stigma and financial constraints. HRQoL domains specifically affected by TB include physical functioning and mental or emotional well-being. Fear of social exclusion and isolation along with social insecurity and inconstant social assistance by family and friends can lead towards failure of TB patients to carry on with social activities and consequently have an effect on the social functioning of TB patients. This social exclusion can also affect TB patients' work and business prospects. Patients also often isolate themselves to avoid spreading infection. As a result HRQoL of TB patients is affected due to social isolation and TB related stigma [3, 4].

Despite the high efficacy of TB treatment, one of the barriers to HRQoL in TB can be perceptions and inadequate knowledge of TB patients about tuberculosis and its treatment. Inadequate understanding about the disease can lead to delayed health seeking behavior and increased risk of TB transmission. Moreover, unawareness about the cure of disease can cause fear and anxiety in TB patients further worsening their quality of lives [5, 6]. Financial burden is another barrier towards poor HRQoL among pulmonary tuberculosis patients which can lead to non-compliance and delayed diagnosis [7-9]. Depressed tuberculosis patients are less likely to seek medical

care or adhere to their treatment regimens. The untreated patients can become a source of transmission of infection leading to spread of disease whereas; irregularities in treatment can lead to drug resistance. Despite this, little attention has been paid to assessment of prevalence of depression among tuberculosis patients [10]. Therefore, for complete assessment of health status of tuberculosis patients, it is necessary to consider the overall impact of disease and its treatment on patient's perceptions of health and well-being along with routine bacteriological, clinical & radiological assessment. Moreover, as with advancement in the medical technologies treatment should also focus on the aspects that can improve quality of life among pulmonary tuberculosis patients. The main objective of this paper is to systematically identify and review the factors leading to depression and influencing health related quality of life among pulmonary tuberculosis patients by reviewing past and present literature.

METHODOLOGY

A systematic literature research was conducted for articles published from January 2000 to June 2016 using the electronic databases PubMed, EMBASE, Google Scholar, PsycInfo and Science direct. The search terms used with each database were quality of life (QOL), health related quality of life (HRQOL), tuberculosis (TB), health status and depression. Full text papers as well as abstracts were retrieved and included in review. A total of 48 studies were retrieved from databases related to health related quality of life and depression among pulmonary tuberculosis patients. The studies were classified on the basis of their country of publishing into developed countries, developing countries and Pakistan. 14 studies from developed countries, 26 from developing countries and 8 studies from Pakistan were included in this review (Table 1). Quantitative cross sectional surveys as well longitudinal studies were included.

Table 1: Details of country and number of included papers

Regions	Number of studies	Countries
Developed countries	**14**	**USA, UK, Canada, Brazil, Poland, Ireland, Portugal**
Developing countries	**26**	**Turkey, South Africa, Malaysia, India, Iran, Malaysia, Russia, Ethiopia, Nigeria, Philippines, Turkey, Sudan, Yemen, Angola, Mexico, Saudi Arabia**
Pakistan	**8**	**-**
Total		**48**

RESULTS & DISCUSSION

Assessment of HRQOL and Depression among Pulmonary TB Patients in Developed Countries

Pulmonary tuberculosis has a negative effect on patient's HRQOL. Mental and physical distress is commonly found in tuberculosis patients which can lead to poor treatment or disease outcome [11]. Everyday activities of almost half of the patients are affected by tuberculosis. Moreover, most tuberculosis patients are disappointed, worried or frustrated after diagnosis and have difficulty in initially accepting their disease [3]. Pulmonary tuberculosis has an impact on all the dimensions of HRQOL including physical, psychological, emotional and social domain [12]. Quality of life of tuberculosis patients has been observed to be poor at baseline or start of treatment with significant improvement after 6 months of therapy [13].

Only few studies of the studies have observed the effect of TB on HRQOL of patients in developed countries as there is low burden of TB in these countries and most of these studies are conducted on immigrants of developing countries. Knowledge about transmission and cure of tuberculosis as well as perceptions regarding the disease can play an important role in improving adherence to therapy subsequently leading to improved quality of life. A study conducted in USA among Mexican immigrants observed that knowledge regarding the transmission of disease was poor and there were misconceptions regarding risk factors. Limited clinic hours, lack of transportation, communication problems and cost of services were reported as major barriers towards poor health related quality of life [14]. Similarly, another study conducted at 22 sites in US and Canada reported poor knowledge regarding tuberculosis disease along with high perceived risk and stigmatization [15]. Misconception about the disease along with negative attitude towards tuberculosis was observed among participants even after contact with health care professionals for the purpose of screening in Sweden. Educational campaigns and TB informative programs can help in improving health-seeking behavior of TB patients along with improved prevention and control of tuberculosis [16].

A study conducted in United Kingdom reported significantly poor HRQoL anf higher depression score both at the time

of diagnosis. However, after 2 months of therapy, generic quality of life improved but still it remained lower than that of general population. Depression levels became normal but anxiety levels still remained high [17]. Similarly another longitudinal cohort study conducted in Canada reported diminished quality of life especially in domain of mental health among tuberculosis patients. However, mental component score improved throughout the treatment period [18]. Lower scores of active tuberculosis patients over all the domains of SF-36 as compared to latent tuberculosis infection patients were reported from a study in Canada. Moreover, it was observed that older people had poor quality of life as compared to younger people [19]. A study conducted in Portugal, observed that younger patients of tuberculosis had better quality of life in the domain of physical health as compare to older people. However, older people had better scores in the domain of social life as compared to young patients [20].

In a study conducted in Poland utilizing WHOQOL questionnaire reported poor HRQoL in the domains of physical and environmental health. Although, there was no difference in the HRQoL among males and females but there were differences observed in the management of stress and health behavior [21]. HRQoL was reported poor in the domain of psychological health followed by environmental then social and finally physical health in Brazil [22]. A study conducted in Canada highlighted role functioning, social support and health behavior as most affected domains of quality of life along with fear of isolation [23]. Another study conducted in Baltimore using focus group discussions reported that TB affected all domains of QoL such as psychological health, general health perceptions, mental and physical health and social functioning. In addition to these factors, fear of isolation, loss of income, social stigmatization, long duration of therapy and pill burden were few of the other factors contributing towards worsening the QoL of tuberculosis patients [24]. Healthcare professionals need to pay special attention to the ways in which TB treatment affects patient's social health along with their mental and physical health to develop policies and strategies to improve QoL [25].

Assessment of HRQoL and Depression among Pulmonary TB Patients in Developing Countries

Few studies assessed the effect of TB on HRQoL in developing countries. Among the tools most widely used, SF-36 is used extensively in different settings and is found to be a valid instrument in measuring HRQoL among TB patients in most of the developing countries. A study conducted in Iran reported HRQoL better in the domain of general health perception with highest scores whereas lowest scores were observed in the domain of role limitation due to emotional problems. Furthermore, patients with better job status, qualification and living in urban areas had better HRQoL scores [1]. Another study conducted in Mexico also reported that perception of health status among tuberculosis patients is generally lower especially in the domains of vitality, general health perception, bodily pain and physical pain [26].

On the other hand, a study conducted in India reported poor HRQoL as compared to normal population especially in the domains of mental health, vitality and general health. Female patients had better QOL in all domains except the domains of social function and emotional health. Mental component summary score was lower than physical component summary score. However, in case of MDR-TB physical component summary score were lower than that of mental component summary score due to adverse effects of drugs and severity of disease [27]. Moreover, another study conducted in Turkey reported poor HRQoL among TB patients as compared to healthy individuals across all domains of SF-36 [12]. Poor HRQoL and presence of depression was reported among family caregivers of tuberculosis patients [28].

The overall mental and physical health scores were lower especially in the domains of general health, emotional health and bodily pain in a study conducted in South Africa [29]. Another study conducted in South Africa reported that tuberculosis patients had poor HRQoL at the onset of treatment with significant improvement after 6 months of therapy. Especially physical health was greatly improved after 6 months of treatment. Moreover, it was observed that educated people had better mental HRQoL whereas psychological distress had negative impact on mental and physical HRQoL of tuberculosis patients

even after completion of 6 months of therapy [30]. Another study reported physical and psychological domains as most affected domains in tuberculosis patients [31]. Poor HRQoL in both mental and physical components of tuberculosis patients was reported in Sudan associated with increased number of symptoms, poor control over illness, expected severe consequences and emotional involvement [32].

TB patients had overall low HRQoL in comparison to the controls especially in the domain of physical health followed by psychological health. Social health score were comparatively higher but were still lower than that of control. Moreover, it was observed that females had overall poor HRQoL as compared to males [33]. TB and HIV co-infected patients had overall low HRQoL when compared to the HIV infected patients who were not suffering from active tuberculosis in Ethiopia. Income, family support and depression had an impact on the HRQoL of patients [34].

Comparison between DR-TB and non-DR TB patients revealed that non-DR TB patients had better HRQoL and functional capacity as compared to DR-TB patients. For the patients of drug resistant tuberculosis the domain most affected was psychological domain followed by environmental domain whereas for the patients of non-drug resistant tuberculosis social health was found to be most affected domain followed by domain of physical health. Important predictors of HRQoL highlighted were employment status, old age, marital status, education level, history of diabetes and drug abuse history [35]. MDR-TB patients had poor HRQoL as compared to pulmonary tuberculosis patients with lowest scores for psychological and environmental domains [36].

A TB-specific scale was used to measure HRQoL among tuberculosis patients in India. DR-12 scale has 12 items 5 of which are related to exercise and socio-psychological factors and 7 items are related to tuberculosis symptoms. This study revealed that sputum positive patients showed a lower score as compared to sputum negative patients. The patients who converted to sputum negative at the end of intensive phase showed significantly higher scores for HRQoL as compared to those patients who failed to convert [37].Another study in which patients who converted after 8 weeks of therapy reported better scores as

compared to patients who failed to convert. Moreover, HRQoL scoring was better for patients who had a favorable outcome at the end of therapy compared to patients who had negative outcome [38]. Another study conducted in Yemen reported that pulmonary tuberculosis patients had poor HRQoL as compared to extra pulmonary tuberculosis patients. However, improved scores were observed at the end of 1 month of treatment and after completion of intensive phase. However, patients who failed to convert at the end of intensive phase did not show improvement in HRQoL [39].

Depression is a common co-morbid condition among tuberculosis patients that can have an impact on their HRQoL and decrease medication adherence. Depression in TB patients is evaluated through different tools. A study conducted in India utilizing PHQ-9 questionnaire reported that 60% of tuberculosis patients were suffering from depression mainly due to socioeconomic status and adverse effects of anti-tuberculosis drugs. Patients of older age were more affected [40]. Majority of tuberculosis patients were reported depressed in Nigeria. Depression is highly associated with persistent cough, older age and poor financial status [41]. A study conducted in Ethiopia used K-10 reported psychological distress throughout the course of treatment but it was more pronounced at the start of treatment [42]. Another study conducted in South Africa using the same scale also reported high prevalence of psychological distress among tuberculosis patients [43]. A study conducted in Ethiopia reported high prevalence of depression and anxiety among tuberculosis patients. Patients with co-morbid HIV infection, poor social support and perceived TB stigma were most likely to had depression whereas patients on intensive phase of TB treatment, current substance abuse, poor social support, co-morbid HIV infection, perceived TB stigma and female gender were more likely to have anxiety [44]. Another study from Angolan reported high prevalence of anxiety and depression among tuberculosis patients. Patients of extra pulmonary TB, MDR-TB and married subjects were more likely to have anxiety. Extra pulmonary TB, MDR-TB and female gender were associated with depression [45].

A study conducted in India reported 82% of the respondents suffered from depression. The depression was related to severity of disease, duration of illness and response to chemotherapy [46]. Another study conducted in India also reported that 44% of tuberculosis patients suffered from depression according to BDI as compared to 24% of controls [47]. A study conducted in Nigeria reported that 45.5% of the patients suffered from depression. Depression was associated with unmarried status of patients, old age, long duration of illness and extensive pathology [48].

Another study conducted in China reported that scores for SCL-90 were significantly higher than those of tuberculosis patients especially in the domains of anxiety, somatization, phobic anxiety, obsessive-compulsiveness, psychotism and paranoid ideation [49]. Another study conducted in Iran also used SCL-90 to evaluate mental health of tuberculosis patients and reported that tuberculosis patients had higher scores in all eight subscales of SCL-90 as compared to healthy individuals and caregivers [50].

Tuberculosis patients suffered from psychiatric morbidity such as depression, anxiety, stress, hypochondriasis and obsessive compulsive disorder. Males and patients aged 46-60 years had more chances of mental illness. Moreover, patients with duration of treatment of more than 3 months and category IV illness had more chances of mental co-morbidity [51]. Another study conducted in South Kashmir using depression anxiety stress scale 42 observed high prevalence of anxiety, stress and depression among tuberculosis patients [52].

Assessment of HRQOL and depression among pulmonary TB patients in Pakistan

World health organization ranks Pakistan at the 5th number among high burden countries for tuberculosis in the world in its global TB report for the year 2015 [53]. According to WHO, in the Eastern Mediterranean region Pakistan accounts for 61% of the TB burden [54]. For all ages and all forms of tuberculosis, the estimated prevalence in Pakistan is 341 TB cases per 100,000 populations. This means that approximately between 510,000 – 730,000 people have active tuberculosis in Pakistan at any given time. The incidence estimated on the

basis of this prevalence is 270 cases of TB per 100,000 populations [55].

Free of cost and equitable access to tuberculosis treatment is necessary to eliminate tuberculosis from Pakistan. Although, most of the patients are aware about the fact that TB treatment is free of cost in Pakistan but still most of the times they had to buy medicines from their pockets leading to increased financial burden. Furthermore, majority of the patients are not provided satisfactory information regarding the treatment of tuberculosis they receive[56].

Psychiatric illness like anxiety and depression are a major barrier against elimination of tuberculosis as they can lead to poor health seeking behavior and non-compliance to the tuberculosis medication. In Pakistan, patients had highest scores for anxiety and depression during first three months of therapy which gradually decreased during 3-6 months of treatment [57]. It was observed that high rate of depression was associated with increased severity of symptoms and feelings of less control over the illness [58]. Misconception about tuberculosis was found to be a major reason for depression. Other reasons reported were disturbances in life processes, long duration of treatment and illness [59].

HRQoL in TB patients is affected particularly in the domains of physical functioning, social, psychological and environmental well-being. Improvement in HRQoL was observed after treatment especially in the physical health but still health related quality of life remained lower than healthy individuals [60]. It was observed that tuberculosis patient's quality of life was most affected in the domain of physical wellbeing. Whereas, domains of emotional wellbeing, pain and social functioning were comparatively better. It was also observed that females have better HRQoL than male patients. Rural areas have better quality of life than urban areas [61]. However, in another study it was reported that urban areas have better utility scores than rural areas [62]. Moreover, it was observed that tuberculosis patients were less satisfied than general population in the domain of material comforts and were unhappy in the domains of physical fitness, relationship to folks, association with close friends, work life and socializing [57]. However, leisure time and high

income had a positive impact on the HRQOL of tuberculosis patients [61, 62].

CONCLUSION

This review paper concludes that TB has a negative impact on all HRQoL domains including physical, social and psychological aspects of TB and this impact can last for a long period of time even after patients are microbiologically cured. This impact is more pronounced at the baseline and tends to improve over the course of treatment. However, even upon completion of therapy, HRQoL of TB patients remain low as compared to healthy individuals. Moreover, social stigma and fear of isolation associated with TB can lead towards depression. All stakeholders must work together to devise strategies for improving all aspects of health needs of the patients including psychological, social and mental wellbeing which can lead to improved health seeking behavior and adherence to medication therapy.

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