Evaluation and Comparison of the Cognitive Distortions of Tubercular Patients and Healthy People

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Abstract

Background and purpose: Tuberculosis is one of the most common infectious diseases in the world. The stigma that is applied by the society, and isolation of the patients due to the contagiousness of the disease, affect the mental health of tubercular patients. Patients with the primary shock of the disease diagnosis, usually experience the denial process which would result in distorted cognitive distortions about the disease. Thus, the goal of current study was evaluating and comparing of the cognitive distortions of tubercular patients and healthy people.

Materials and Methods: This was a case–control study which cognitive distortions of the tubercular patients and healthy people (hospital staff) were compared in it. Hundred persons were selected by random method for each group. Instruments that were used included the structured demographic questionnaire and cognitive distortions scale.

Results: Patients used overgeneralization and personalization cognitive distortions significantly (PV≤0.01) more than healthy people. Women patients used emotional reasoning and overgeneralization and men patients used labeling more than others.

Conclusion: The number of cognitive distortions was more in patients. Therefore, evaluation of the cognitive distortions of the tubercular patients would be important for offering accurate psychological and psychiatric services that cause improvements in the body and mental status.

Keywords: Cognitive distortion, healthy, mental health, tuberculosis disease

Introduction

Infectious or transmissible disease is a kind of disease that is transmitted by infection and cause the incidence of disease symptoms. Meanwhile, tuberculosis is a common infectious disease that is caused by various mycobacterium species [1]. Currently, more than 20 million people in the world are infected with tuberculosis. Tuberculosis disease causes about two million deaths in the world and it has been mentioned as a global emergency by the World Health Organization [2, 3] Tuberculosis symptoms include hemoptysis, pain, fever and sweating at nights, weight loss and fatigue [4]. Our own country, Iran, is in serious danger of tuberculosis outbreak because of being neighborhood with Pakistan and Afghanistan countries which are among the most infected areas with tuberculosis bacteria in the world. Tuberculosis disease is most common in Sistan Baluchestan and Golestan States of Iran. Iran has ranked as 17th country for the outbreak of the tuberculosis disease in the world. The incidence rate of the tuberculosis disease is 26 in each 100,000 people in Iran and 17.9% of the population are infected [5, 6]. On the other hand, the tuberculosis disease is correlated with increased population, insufficient nutrition, and poverty in general. Pulmonary chronic diseases, smoking, alcoholism, and diabetes mellitus disease are among the risk factors for incidence of tuberculosis disease. The most dangerous risk factor for tuberculosis disease in the world is Human Immunodeficiency Virus (HIV) [7–10]. Social stigma and isolation, disruption of interpersonal and social relationships, long-term treatment, decreased income and psychological complications like depressive and anxiety disorders as well as physical problems are among the serious difficulties of the tubercular patients [11]. Understanding the discrimination and stigma resulted from the disease plays important role in the patient's experience of his or her illness. The rejection of the tubercular patients by the society, their isolated maintenance

because of contagiousness of the tuberculosis disease, and becoming a by-word in the society affect the mental health of tubercular patients in long-term period and cause dramatic psychological complications [12]. The difficulties of tuberculosis disease are as special painful experiences in psychological, social and biological life of the person, where the related stress play important role in appearance of psychological problems [13].

According to the cognitive model, we are always evaluating and interpreting the information within our internal and external world. Our brains are always classifying the data and try to make sense from the environmental stimuli. The process of making sense includes some carelessness because optimal mode our knowledge and cognition is just the approximate representation of objective experiences. Thus, the interpretation of the surrounded environment is not precise and objective process and is not accordant to the reality completely, instead it is distorted and accordant to active schemas of the people, alongside with cognitive distortions or mistakes [14].

According to Aaron Beck theory, some logical mistakes exist in automatic thoughts and cognitions of people with affective and emotional disorders [15]. Special psychological status like mood, anxiety and emotional disorders affect the way that the person encounters with self and the world which constitute distorted cognitions [14]. The primary shock of receiving the tuberculosis diagnosis usually result in denial process for a long period of time which may produce cognitive distortions about the disease. Negative impressions of tubercular patients about the self and the disease, the impressions of the society about the tuberculosis disease, the social believes about the community health, the dominant culture of the society, altogether play important role in social and mental status of the patient [13]. In fact, cognitive distortions are incorrect assumptions which result in thought bias. The thought bias

would make distance between the person and the reality of the life. It results in some misunderstandings in personal and interpersonal behaviors which would make the person prone to psychiatric disorders. When the information processing is incorrect, cognitive distortions show up. Usually, the important believes and schemas of the people are exposed to cognitive distortions [15].

Some cognitive distortions include personalization, labeling, should statements, emotional reasoning, magnification and minimization, mental filter, overgeneralization, all or nothing thinking, fortune telling, catastrophizing, blaming, unfair comparison, always being regretful and judging [16]. The cognitive distortions are among the psychological constructs of tubercular patients in encountering with the disease and play significant role in adherence to the treatment and pulmonary rehabilitation [17]. The psychological adaptation of the tubercular patients is primarily impressed by negative impressions about the self. On the other hand, the attitude and understanding of the society about the tuberculosis disease is an important factor that can affect the understanding of the patient about the self [13].

According to the effects that the tuberculosis disease leaves on the life, physical and mental status, understanding and thought of the patients, and due to the correlation of the psychiatric disorders with cognitive distortions and irrational believes, the goal of the current study was identification and comparing the cognitive distortions of tubercular patients with healthy people for providing better and more comprehensive treatment for everyone. Indeed, nowadays psychological concepts are among the most important factors for adherence to the treatment and pulmonary rehabilitation. The hypothesis of the research included the difference of cognitive distortions of tubercular patients and healthy people and existence of more cognitive distortions in patients compared to healthy group. In fact, the importance and necessity of the research is applied for providing precise and sufficient

psychological services by achieving the knowledge about the cognitive distortions of tubercular patients. The early psychological and psychiatric interventions would improve the physical and psychological status and eventually quality of life. Considering and recognizing the psychological features of the patients including cognitive distortions of the patients which affect the disease and treatment process, helps the psychologists and psychiatrists to provide the treatment plan accordant with special characteristics and needs of the patients and obtaining better treatment ultimately.

Materials and methods

This research was case–control study in which cognitive distortions of tubercular patients and healthy people (hospital personnel) were compared. The proportion of tuberculosis disease in Iran is 26 out of each 100,000 people. Thus, the sample size could be 40 persons in each group considering the confidence level of 1.96. But we investigated 100 people in each group for reducing the error rate [18].

The sample groups were selected, after confirmation of the research project in the research and ethical committee. The sampling process was done through random method from the tuberculosis clinic and healthy personnel of a hospital in Tehran, Iran.

The essential information about the research was presented to the sample groups. The questioning process was begun after obtaining the informed consent from the sample groups. The sample groups were assured that their information would be completely confidential and they would be applied just as article in general format. The statistical population of the study included the tubercular patients and healthy personnel of the hospital that the work was done in it, in the years 2015–016.

The inclusion criteria for tubercular patients: minimum age of 18 years old, absence of psychiatric disorder which would cause psychiatric drug

consumption by psychiatrist order, the ability to understand and answering the questions, having complete consciousness, informed consent for participation in the study, having definite diagnosis of tuberculosis disease.

The exclusion criteria for tubercular patients: the incidence of any physical problem that would interfere with the questioning process, reluctance of the subject for continuing participation in the study, loss of consciousness.

The inclusion criteria for healthy sample: working in the hospital, absence of psychiatric disorder which would cause psychiatric drug consumption by psychiatrist order, inclination for participation in the research.

The exclusion criteria of healthy subjects: reluctance for continuing the participation in the study.

Instruments that were used for the study

Structured demographic questionnaire: it evaluates age, gender, marital status, occupation, and education level.

Cognitive distortions scale: it includes 20 phrases which evaluate cognitive distortions that Albert Ellis had introduced them. The sub-scales of the cognitive distortions scale include all or nothing thinking, overgeneralization, mental filter, minimizing the positive, fortune telling, magnification and minimization, emotional reasoning, should statements, labeling and personalization. The scoring is as Likert format from 1 to 5 score. The person who uses more cognitive distortions receives lower score and vice versa. The Chronbach-Alpha for the internal consistency of the scale was 0.8. The validity coefficient of the scale was 0.85 [19].

Statistical analysis

Calculating the frequency, percentage, mean, standard deviation and distribution tables were applied as descriptive statistics for data analysis. The inferential statistical methods including t-test and two way ANOVA were applied for comparing the mean scores in two groups and comparing the cognitive distortions sub-scales and the gender respectively. The SPSS-22 software was used for data analysis. All of the hypothesis were tested in $p < 0.05$ level.

Results

The mean age of all 200 subjects was 39.94 years old. 43% were women and 57% were men. 32.5% were single, 62.5% were married and 5% were divorced and widowed. 14% had elementary education degree, 13.5% had intermediate education degree, 33.5% had high school education degree and 39% had academic education degree. 53% had low income jobs, 44.5% had mediocre income job and 2.5% had high income jobs. There was a significant difference (P.V= 0.00) in gender, education and occupation status between two groups. Number of men was significantly higher in tubercular patients group. The healthy group had significant higher education level compared to tubercular patients. The tubercular patients had significantly more jobs with low income. There was not a significant difference in age and marital status between two groups.

According to the above Table 1, there was a significant difference in overgeneralization and emotional reasoning sub-scales between two groups (P.V=0.00). Tubercular patients used the mentioned sub-scales significantly more than healthy people. In addition, all or nothing thinking, magnification and minimization, labeling cognitive distortions were more common in patients than healthy people. The cognitive distortions of minimizing the positive and mental filter were more common in healthy group.

As it is observable in Table 2, women patients used minimizing the positive and should statements cognitive distortions significantly less than others. Furthermore, women patients applied emotional reasoning and overgeneralization cognitive distortions more than others. The men patients used labeling cognitive distortion more than others.

Table 1– The comparison of cognitive distortions sub-scales in two groups by independent t test

Sub-scales	Groups	M	SD	t score	P.V
All or nothing thinking	Tubercular patients	3.62	1.78	–0.4	0.68
	Healthy personnel	3.73	1.7		
Overgeneralization	Tubercular patients	2.97	2.32	–2.36	**0.01
	Healthy personnel	3.7	2.03		
Mental filter	Tubercular patients	3.77	2.61	1.51	0.13
	Healthy personnel	3.27	2.01		
Minimizing the positive	Tubercular patients	3.44	2.5	1.09	0.27
	Healthy personnel	3.07	2.26		
Fortune telling	Tubercular patients	3.4	2.49	0.93	0.92
	Healthy personnel	3.37	2.06		
Magnification and minimization	Tubercular patients	3.27	2.46	–0.6	0.54
	Healthy personnel	3.46	1.95		
Emotional reasoning	Tubercular patients	2.26	1.91	–3.1	**0.00
	Healthy personnel	3.15	2.13		
Should statements	Tubercular patients	4.46	2.5	1.99	0.47
	Healthy personnel	3.58	1.74		
Labeling	Tubercular patients	2.46	2.22	–1.41	0.16
	Healthy personnel	2.89	2.08		
Personalization	Tubercular patients	3.87	2.39	1.68	0.09
	Healthy personnel	3.35	1.95		
Total score	Tubercular patients	33.39	11.94	–0.18	0.85
	Healthy personnel	33.73	13.38		

** 0.01 p-value/ * 0.05 p-value

Table 2– Comparing the cognitive distortions sub-scales between patient and healthy men and women by two way ANOVA

Sub-scales	F	p-value	M (Patients)		M (healthy group)	
			Women	Men	Women	Men
All or nothing thinking	2.3	0.13	3	3.86	3.69	3.76
overgeneralization	0.42	0.51	2.32	3.22	3.5	3.89
Mental filter	0.51	0.47	4.14	3.62	3.28	3.26
Minimizing the positive	6.65	**0.01	4.11	3.18	2.69	3.6
Fortune telling	0.12	1.91	3.21	3.47	3.29	3.48
Magnification and minimization	0.27	0.6	3.86	3.04	3.66	3.19
Emotional reasoning	0.3	0.85	1.89	2.4	2.98	3.38
Should statements	4.11	*0.04	5.64	4	4	3.64
labeling	0.25	0.61	2.86	2.31	2.98	2.76
personalization	0.22	0.63	4	3.82	3.29	3.43
Total score	0.55	0.45	34.75	32.86	33.33	34.29

** 0.01 p-value/ * 0.05 p-value

Discussion and conclusion

The mean age of tubercular patient was 40.69 years. 63.2% of them were men and 57% of them were married. 39.1% had high school education and 69% had low income jobs. In the current research, tubercular patients used more cognitive distortions. They specially applied overgeneralization and emotional reasoning cognitive distortions significantly more than others, which manifests exaggeration in disease symptoms and non-compliance of the patients to the physician medical orders. In addition, cognitive distortions of magnification and minimization and labeling were more common in patients than healthy people. But minimizing the positive and mental filter cognitive distortions were more common in healthy people which reflect the insufficient attention to different subjects. Men used minimizing the positive and should statements significantly more than others which shows the inflexibility of the men. Women patients used emotional reasoning and overgeneralization more than others which show the characteristics of attributing to the self and exaggerating the problems. Men patients also used labeling cognitive distortion more than others.

We evaluate some other researches in the similar domain with our current one. In a cross- sectional study on tubercular patients of Massih Daneshvari Hospital in Tehran, it was showed that the tuberculosis disease would affect different aspects of the quality of life of the patients more than what we expected. In the same vein, the most effects of tuberculosis disease are imposed on physical and mood status [20]. Yet, there is limited information about the quality of life the tubercular patients and the long-term effects of the tuberculosis disease. Thus, systematic evaluation of the quality of life the tubercular patients, in more comprehensive style is essential [21]. Tubercular patients show various reactions when receive the disease diagnosis. They may suffer depression, jealousy, fear, grudge, anger, feeling lonely, inefficiency, guilt feeling and suicidal ideation. However, suicide attempt is rare between them [13]. Various and severe psychiatric disorders exist in tubercular patients [22]. Psychological distresses and psychosis symptoms have high prevalence between tubercular patients [23]. 31% of them suffer psychiatric disorders. Recognizing the psychiatric disorders in the primary stages of the tuberculosis disease, would help the patients in treatment compliance and improvement. Thus, referring the tubercular patients to psychiatrists and psychologists by other physicians should be developed more [16]. According to DSM-IV[1], some psychiatric disorders have been diagnosed in tubercular patients, which include: 1 – adjustment disorder, 2 – mood disorders (especially major depression which is equivalent to depressive disorders in DSM-5), 3 – anxiety disorder (especially generalized anxiety disorder, acute stress disorder, post-traumatic stress disorder (equivalent to trauma and stressor-related disorders in DSM-5), 5 – delirium and other cognitive disorders.[24] Meanwhile, major depression disorder, post-traumatic stress disorder and acute stress disorder are among the most common psychiatric disorders in tuberculosis patients. In a study, the major depression disorder was the most common psychiatric disorder in tubercular patients. Thus, evaluation of the mental health of the tubercular patients was recommended for comprehensive health care [25]. It was also indicated that depression and anxiety symptoms are important risk factors for decrease in quality of life. They may cause impairment in the function quality, exacerbation of disease symptoms, long term and frequent hospitalizations, failure to quit smoking, non-compliance to the physical and rehabilitation treatments, and more mortality rates [26]. Depression and anxiety symptoms impact the quality of life and other related factors more than other

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[1] Diagnostic and Statistical Manual of Mental Disorders (fourth edition)

factors in chronic obstructive pulmonary patients [27]. Tubercular patients with anxiety and depression disorders, understand the disease more than others [28]. Moreover, there is a correlation between low educational level with psychological problems in tubercular patients [29]. There is also significant correlation between marital conflicts with interpersonal cognitive distortions, dysfunctional attitudes and irrational believes [30]. The hope factor and applying eclectically psychotherapies focused on hope, significantly reduces unrealistic interpersonal expectations and cognitive distortions of couples [31]. Indeed, tubercular patients need receiving the psychotherapy, as well as the physical treatment. The psychotherapies increase the hopefulness, which is a determinant factor against tuberculosis disease [32]. Considering the existence of two cognitive distortions in tubercular patients compared to healthy people, the necessity of paying attention to psychological factors in organic patients is depicted in the current research. Otherwise, the comprehensive treatment of the patients and eventually their improvement would be prevented.

Limitations and suggestions of the research

One of the most important limitations of the research was the inappropriateness of the physical status of the patients which made the questioning process so complicated and time consuming. But all of the questioners tried to interview the patients in the most appropriate time and place. It is suggested that the researchers in the future, evaluate various psychological variables in different organic patients for better recognizing the patients and providing the comprehensive treatment for them.

Ethical Considerations

The current scientific research project has been approved in the ethical committee of Massih Daneshvari Hospital. Informed consent was obtained

by all participants and the project was confirmed to the Declaration of Helsinki.

Authors' contributions

- Conception and design: Dr Mitra Safa and Dr Payam Tabarsi
- Acquisition of data: Ms Farzaneh Haji Zadeh
- Analysis and interpretation of data:Dr Mitra Safa
- Drafting of the manuscript: Dr Fatemeh Ghassem Boroujerdi
- Critical revision of the manuscript for important intellectual content: Dr Mitra Safa
- Statistical analysis: Mr Bamdad Mirab Zadeh Ardekani
- Administrative, technical, or material support: Dr Payam Tabarsi
- Supervision: Dr Mitra Safa and Dr Payam Tabarsi

Conflict of interest

There was no conflict of interest in providing the current article.

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