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Original Research Article

Impact of an Instructional Program on Specific Health-Related Quality of Life concerning Tuberculosis Patients among A sample in Baghdad City

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Abstract

This research aimed to assessing specific health-related quality of life for pulmonary tuberculosis patients before and after applying the suggested instructional program, and to find out relationships among distribution of an overall assessment specific quality of life improvement and socio-demographic characteristics variables. Self-controlled design to studying effectiveness of applying instructional program on specific quality of life for pulmonary tuberculosis patients among sample size (65) patients from primary health care centers/AL-Sadur City sector-the consultation clinic of chest and respiratory diseases at AL-Rusafa health directorate and Ibn-Zuhr Hospital at Baghdad city. An instructional program has been applied with an approach of pre-test and post-test for checking improvements on the study sample concerning specific quality of life. This study applied questionnaire format of "Evaluation of a Cough-Specific Quality-of-Life", questionnaire which were published at "Chest Journal official Publication of American College of Chest Physicians", and consists (28) items. The methods used descriptive statistics (Observed frequencies, percentages, mean of score, standard deviation, relative sufficiency, and Stem–Leaf plot method) to evaluate the specific QoL-Improvements, as well as inferential statistical methods are used such that (Wilcoxon Signed Rank, McNemar, and Analysis of covariance (ACNOVA)). Results shows that studied disease is classified to indigence diseases, which clear the effectiveness of crowding index and poor socio-economic status on the disease incidence. Suggested of instructional program shows a highly stating of improvements with pulmonary tuberculosis patients and results illustrated that most of questionnaire's items are assigned meaningful improvements significantly at p-values <0.01 due to the effectiveness which were obtained positively by the suggested of instructional program application which are included "Physical, Psychological, Functional, Emotional, Extreme well-being, Personal Safety, and Specific QoL", except of "Functional" main domain, since no significant different are accounted at P-value >0.05, rather than simply improvement are assigned positively. Suggest to applied the instructional program in all consultation clinic for chest and respiratory disease and its coordinator tuberculosis units after training specialized staff, reducing the crowding index and enhancing the economic status for patients through governmental commitment by offering financial supports and food supplements to all patients, we suggest to do similar researches about this subject in the future.

Key words: Pulmonary Tuberculosis Disease, Cough-Specific Quality-of-Life, TB instructional program, Health- Related Quality of Life, Specific-Quality-of-Life

INTRODUCTION

TB is an ancient disease which has affected mankind since the beginnings of recorded time and is associated with poverty, malnutrition, overcrowding and immunosuppressant persons, Even though Robert Koch discovered the infectious agent and the disease nature since 1882, knowledge about disease history and physiopathology has progressed but TB continues to be global public health problem (Orcaua et al., 2011).

TB an airborne infectious bacterial disease caused by bacterial disease caused by *Mycobacterium tuberculosis* bacilli (MTB) which typically affects the lungs also may spread to other body organs by bloodstream resulting in miliary TB, meningitis, pericarditis or genitourinary infection, MTB transmitted via inhalation airborne droplets from the throat and lungs of infected patients with pulmonary or laryngeal TB to other persons, the major characteristics of pulmonary TB (PTB) are coughing sometimes with sputum or blood, chest pains, weakness, weight loss, fever and night sweat (American Thoracic Society/Centers for Disease Control and Prevention/Infectious Disease Society of America, 2003).

TB remains an important public health problem and ranks as the second leading cause of death among infectious diseases worldwide, after the Human Immunodeficiency Virus (HIV) infection. TB new cases estimated nearly 10 million per year, also 2 billion of the world's population are thought to be infected with *M. Tuberculosis* as a latent infection, new infection are occurring at the rate of one per second (Iñaki and Sebastien, 2009; Haradhan and Mohajan, 2015). Predictable that the number of TB related deaths will rise from 3 to 5 million per year by 2050 if control is not further strengthened. TB is not only a problem for the health of the individuals but also a major obstacle to the economic and social development for the developing countries (Haradhan and Mohajan, 2015). TB is a classic illustration of disease with both medical and social dimensions, characterized by its close relation to poor socio-economic conditions (Pachi et al., 2013). Despite the discovery of the first TB drug over 50 years ago, current treatment regimens for susceptible TB still require the use of a combination of potentially toxic antibiotics for a minimum of six months to ensure eradication (Medical Research Council Streptomycin treatment of pulmonary tuberculosis, 2008; Connolly et al., 2007). As such, patients' health-related quality of life (HRQL), i.e., valued aspects of life, may be diminished by side effects from medication, prolonged treatment duration, and in some cultures, social stigma attached to the disease (Gordon et al., 1993; Miller et al., 2009; Keshavjee et al., 2008).TB disease itself may also have a negative impact on TB patients' self-perceived health status, HRQL data are widely recognized as an important input in such exercises, particularly for chronic diseases (Guo et al., 2008; Deribew et al., 2009). The World Health Organization (WHO) defined HRQoL as "the optimum levels of physical, mental, and social functioning, including relationships, perceptions of health, fitness, life satisfaction and well-being that influenced by evaluation of the patients level of satisfaction with treatment outcome, health status and with future outlook" (Theofilou, 2013).

METHODOLOGY

Design of study: A self-controlled design for studying effectiveness of applying instructional program on pulmonary tuberculosis patients among convenient sample in Baghdad city. An instructional program has been constructed and applied with an approach of pre-test and post-test for checking improvements on the study sample concerning specific quality of life. This study carried out from November 1st 2015 to April 1st 2016.

Setting of the Study

The study done among patients of the primary health care centers/AL-Sadur city sector-the consultation clinic of chest and respiratory diseases at AL-Rusafa health directorate, and Ibn-Zuhr Hospital at Baghdad city, since individuals reflects the state of convenience sample. From that health institutions, patients with pulmonary tuberculosis had been chooses with their permission to be included in the study program randomly, the total sample was (65) patients, which were the study conducted.

Steps of the Study

For an implementation quality of life instructional program to assess effectiveness of instructional program on pulmonary tuberculosis patients concerning criteria "Specific" quality of life questionnaires. To assesses patients need, This study use a reliable questionnaire format of "Evaluation of a Cough-Specific Quality-of-Life", which were published at "Chest Journal official Publication of American College of Chest Physicians", and consists (28) items. This study take into consideration the significant of patients socio-demographical characteristics variables, as well as risk factors such that, crowding, malnutrition, chronic lung disease, diabetes mellitus, certain medications such as corticosteroids and infliximab (an anti- tnf alpha inhibitors), genetic susceptibility. The researcher interviewed patients, for (30 – 45) minutes to answer all questions. The results of the initial assessment before applying the instructional program indicated that patients

having unsatisfactory QoL toward them self, which indicated their needs of the suggested program.

Reliability of pilot study

A convenient sample of ten patients were selected randomly. Table (A) showed estimation of reliability coefficients of pilot study, this results shows that intra examiner (test and pretest), and inter examiners recorded highly and adequate outcomes, throughout using Al-Naqeeb Formula (Al-Naqeeb, 2007):

$$\text{Relibility value} = \left(1 - \frac{no.\ of noncoincidences items}{no.of all items * samplesize of pilot study}\right) * 100\%$$

Table A. Reliability Coefficients of the Pilot Study

Reliability Coefficients	Actual values
Inter Examiners	93.08 (18:260)
Intra Examiner	90.38 (25:260)

Reliability of questionnaire

Internal consistency was calculated by using: Alpha Cronbach, as shown in table (B) the internal consistency in light of responses is successful, all these means designed questionnaire were valid to study the phenomenon on the same population at any time in the future.

Table B: Reliability Coefficients of the Studied Questionnaire's for who had overweigh and obesity

Reliability Coefficients	Questionnaire	Standard lower bound	Actual values	Assessment
Methods of Reliability	Alpha (Cronbach)	0.70	0.9431	Excellent

Statistical analysis methods

Statistical data analysis approaches were used in order to analyze and assess results of this study which classified in two parts, descriptive statistics, such that Tables Frequencies, Percentages, association tables, and graphical presentation throughout using cluster bar chart], and inferential statistics, such that [Chi-Square for testing the independency, Binomial test for testing two categories nominal scale, ACNOVA, McNemar test for the contingency table for testing significant of improvement relationship.

RESULTS

Results shows that all the studied of (SDCv) had reported significant differences at P<0.01, except of gender which are represented significant different at P<0.05, and age groups had no significant at P>0.05. (Table 1)

It could be concluded that all studied patients were recorded "Low and Moderate" socio-economic status levels, and they are accounted 65 (100%). It could be concluded that studied disease are under the umbrella of indigence diseases. (Table 2).

Results in table (3) Results indicated that there has been a highly significant differences at P<0.01 among different levels of the studied (risk factors), except for "Genetic susceptibility", which represented no significant differences at P>0.05.Relative to "Crowding indicator", most of studied subjects are suffering from crowding condition, and they accounted 62(95.4%), as well as 52(80.0%) had malnutrition status, and 12(18.5%) had chronic disease, and 8(12.3%) had diabetes mellitus, and 6(9.2%) had a certain medications, such that, (Corticosteroids and Infliximab), and finally half of studied subjects had genetic susceptibility, and they are accounted 32(49.2%).

Regarding subjects of table (3): For summarizing preceding results, it can be concluded that instructional program application plying meaningful role concerning specific quality of life for the studied subjects, and that were assigned with most of the studied questionnaire's items concerning general quality of life part, and they are accounted 20(71.4%).

Regarding subjects of table (4) shows summary statistics and initial assessment, such that, grand mean of score, standard deviation, and relative sufficiency are included for assess responding levels of the studied sample either initially at the pre period of time or after applying instructional program in compact form throughout studying questionnaire's main domains concerning specific quality of life part, which are included "Physical, Psychological, Functional, Emotional, Extreme well-being, Personal Safety, and Specific QoL", as well as comparisons significant throughout "Wilcoxon sign rank" test are represented, and illustrated that all of questionnaire's main domains are assigned meaning improvements at p-values <0.01 due to the effectiveness which were obtained positively by the suggested of instructional program application, except of "Functional" main domain, since no significant different are accounted at P-value >0.05, rather than simply improvement are assigned positively.

Table 1. Distribution of Demographical Characteristics variables with comparisons significant

SDCv.	Groups	No.	%	C.S. (*) P-value
Age Groups	< 20	11	16.9	χ^2= 8.200 P=0.146 (NS)
	20 _ 29	14	21.5	
	30 _ 39	17	26.2	
	40 _ 49	9	13.8	
	50 _ 59	5	7.7	
	60 >	9	13.8	
	Mean ± SD	36.94 ± 16.57		
Gender	Male	41	63.1	P=0.047 (S)
	Female	24	36.9	
Marital Status	Single	15	23.1	χ^2= 46.200 P=0.000 (HS)
	Married	39	60	
	Divorced	5	7.7	
	Widow	6	9.2	
Education level for patients	Illiterate	9	13.8	χ^2= 27.215 P=0.000 (HS)
	Read & Write	6	9.2	
	Primary	26	40	
	Intermediate	9	13.8	
	Secondary	10	15.4	
	institute & More	5	7.7	
Education level for (wife/ or husband/parents of upper level)	Illiterate	18	27.7	χ^2= 34.415 P=0.000 (HS)
	Read & Write	10	15.4	
	Primary	24	36.9	
	Intermediate	8	12.3	
	Secondary	3	4.6	
	institute & More	2	3.1	
Job of patients (Occupation)	High Professionals, or owner of large land	0	0.0	P=0.000 (HS)
	Lower professionals, skilled and semiskilled	16	24.6	
	Unskilled workers as laborers, farmers casual workers, …	49	75.4	
Job of parents (Occupation)	High Professionals, or owners of large land	0	0.0	P=0.000 (HS)
	Lower professionals, skilled and semiskilled	11	16.9	
	Unskilled workers as laborers, farmers …	54	83.1	
Residency	Urban	51	78.5	P=0.000 (HS)
	Rural	14	21.5	
Socio-Economic Status	Low	58	89.2	P=0.000 (HS)
	Moderate	7	10.8	
	High	0	0.0	

(*)HS: Highly Sig. at P< 0.01; S: Sig. at P< 0.05; NS: Non Sig. at P> 0.05; Testing of random distribution are based on (Chi-Square & Binomial tests).

Table 2. Sample's distribution according to Patient's risk factors with comparisons significant

Risk Factors	Groups	No.	%	C.S. (*) P-value
Crowding	No	3	4.6	P=0.000 (HS)
	Yes	62	95.4	
Malnutrition	No	13	20	P=0.000 (HS)
	Yes	52	80	
Chronic lung disease	No	53	81.5	P=0.000 (HS)
	Yes	12	18.5	
Diabetes Mellitus	No	57	87.7	P=0.000 (HS)
	Yes	8	12.3	
Certain medications(**)	No	59	90.8	P=0.000 (HS)
	Yes	6	9.2	
Genetic susceptibility	No	33	50.8	P=1.000 (NS)
	Yes	32	49.2	

(*)HS: Highly Sig. at P<0.01; S : Sig. at P<0.05; NS : Non Sig. at P>0.05; Statistical Hypothesis based on Binomial test.
(**)Certain medications as corticosteroids, Infliximab, and TNF monoclonal antibody).

Table 3. Summary Statistics of patients responding concerning specific quality of life's items at different periods (before and after instructional program) with comparisons significant

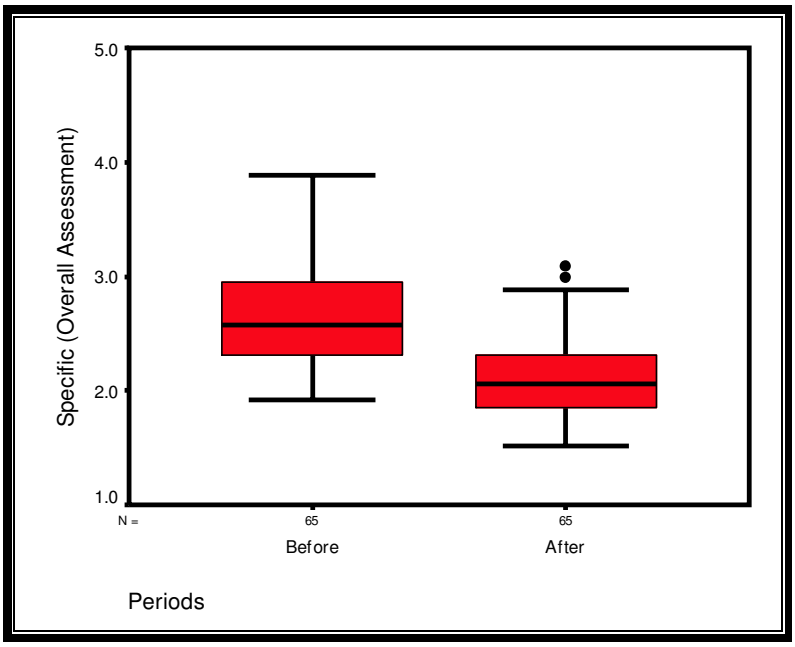
Specific QoL Questionnaires	No.	Before			After			Z-value	Sig. (*)	CS
		MS	SD	RS%	MS	SD	RS%			
Family and or close friends can't tolerate it anymore	65	2.45	0.66	61.3	1.98	0.87	49.5	-4.739	0.000	HS
I have experienced prolonged absences from important activities such as work,…	65	3.11	0.56	77.8	2.95	0.57	73.8	-1.478	0.139	NS
I have been completely prevented from engaging in important activities such …	65	2.94	0.63	73.5	2.78	0.72	69.5	-1.378	0.168	NS
I have lost my appetite	65	3.14	0.46	78.5	2.31	0.68	57.8	-5.776	0.000	HS
I am sick to my stomach and vomit	65	2.69	0.77	67.3	1.95	0.62	48.8	-5.117	0.000	HS
I cough and it makes me retch (dry heaves).	65	2.92	0.62	73.0	2.18	0.70	54.5	-5.953	0.000	HS
I have a fear that I might have AIDS or tuberculosis	65	2.62	0.70	65.5	1.49	0.59	37.3	-6.220	0.000	HS
I have headaches	65	2.72	0.57	68.0	2.06	0.68	51.5	-4.950	0.000	HS
I am concerned that I have cancer.	65	2.40	0.97	60.0	1.48	0.71	37.0	-5.564	0.000	HS
I am dizzy.	65	2.82	0.46	70.5	2.42	0.75	60.5	-3.805	0.000	HS
I wet my pants	65	1.71	0.88	42.8	1.42	0.70	35.5	-3.043	0.002	HS
I soil my pants.	65	1.28	0.52	32.0	1.22	0.45	30.5	-0.816	0.414	NS
I sweat	65	2.58	0.56	64.5	1.88	0.63	47.0	-5.813	0.000	HS
I am hoarse	65	2.40	0.70	60.0	2.06	0.73	51.5	-3.664	0.000	HS
It hurts when I breathe	65	3.11	0.50	77.8	2.80	0.54	70.0	-3.038	0.002	HS
I broke a rib.	65	1.38	0.52	34.5	1.32	0.47	33.0	-0.816	0.414	NS
I cannot sleep at night	65	3.03	0.43	75.8	2.65	0.65	66.3	-4.003	0.000	HS
I have difficulty speaking on the phone	65	2.62	0.55	65.5	2.12	0.78	53.0	-4.820	0.000	HS
I can no longer sing, for instance, in church.	65	2.92	0.54	73.0	2.74	0.69	68.5	-1.846	0.065	NS
I have stopped going to social activities such as movies, plays, and town meetings	65	2.85	0.62	71.3	2.83	0.63	70.8	-0.144	0.886	NS
I have had to change my lifestyle	65	2.78	0.60	69.5	2.80	0.69	70.0	-0.144	0.885	NS
I ache all over.	65	3.20	0.56	80.0	2.22	0.54	55.5	-6.629	0.000	HS
I am exhausted.	65	2.98	0.65	74.5	1.92	0.69	48.0	-6.290	0.000	HS
I am embarrassed	65	3.23	0.61	80.8	2.37	0.57	59.3	-5.977	0.000	HS
I am upset by people thinking that I have something wrong with me	65	3.17	0.67	79.3	2.40	0.84	60.0	-4.941	0.000	HS
I want to be reassured that I do not have anything seriously the matter with me	65	3.17	0.60	79.3	3.14	0.56	78.5	-0.300	0.764	NS
I am self-conscious	65	2.86	0.50	71.5	2.60	0.58	65.0	-2.660	0.008	HS
I am concerned that I have something seriously the matter with me.	65	3.12	0.65	78.0	1.89	0.79	47.3	-6.068	0.000	HS

(*)HS: Highly Sig. at P<0.01; S: Sig. at P<0.05; HS: Non Sig. at P>0.05; Statistical hypothesis based on Wilcoxon signed rank test.

Table 4. Summary Statistics of (instructional program)concerning specific quality of life's main domains at studied periods

SpecificQoL	No.	Before			After			Z-value	Sig. (*)	CS
		GMS	SD	RS%	GMS	SD	RS%			
Physical	65	2.887	0.255	72.2	2.256	0.379	56.4	-6.966	0.000	HS
Psychological	65	2.812	0.384	70.3	2.348	0.473	58.7	-5.881	0.000	HS
Functional	65	2.920	0.389	73.0	2.822	0.486	70.5	-1.200	0.230	NS
Emotional	65	1.919	0.436	48.0	1.377	0.381	34.4	-6.124	0.000	HS
Extreme well-being	65	2.150	0.444	53.8	1.692	0.439	42.3	-6.111	0.000	HS
Personal Safety	65	2.897	0.500	72.4	2.169	0.500	54.2	-6.083	0.000	HS

(*)HS: Highly Sig. at P<0.01; Non Sig. at P>0.05; Statistical hypothesis based on Wilcoxon signed rank test.



Stem – Leaf Pot of Grand Mean Scores concerning Specific QoLmain domains at studied periods before and after application of instructional program.

Figure 1. Represented graphically the preceding improvements of specific QoL by (Stem - Leaf) plot.

DISCUSSION

With respect to discussion of socio-demographic characteristics of pulmonary TB patients most studies are to be similar turned out of present study. Among these studies done in Italia in 2011, which indicated that among infected persons incidence of TB is highest with male at during late adolescence and early adulthood that age groups, and that may be due to that groups are more contact with environmental factors, and low socioeconomic status (Odone et al., 2011).

Associated factors subjected within this study, such that "Chronic lung disease, Diabetes Mellitus, and Genetic susceptibility", results showed that the percentage is inconsiderable recorded, especially about genetic susceptibility cases, and that in agreement with finding of study done by Chronic Lung Disease, (Anthony et al., 2015). They concluded that in TB endemic areas, the disease is strongly associated with the presence of chronic respiratory disease in adults, as well as with finding of study done Dooley K. and Chaisson R. They showed that there is growing evidence that diabetes mellitus is an important associated factor for tuberculosis and might affect disease presentation and treatment response. In addition to that, Abhimanyu, Bose M. and JHA P., in their study they are examined association of 25 sequence polymorphisms in six candidate cytokine genes namely IFNG, TNFB, IL4, IL1RA, IL1B and IL12 and their related haplotypes with risk of developing pulmonary tuberculosis (PTB) among north Indians (Abhimanyu et al., 2012).

Regarding to subject "SpecificQoL- Physical Activities", a study done by Ran Lee S. in South Korea 2015, which involved 126 patients showed they had problems in physical domain before applying information program and are decreased after applying, like in terms of dizziness of physical status, and that were (27.46), while they are accounted (31.58) before application of the studied instructional program, as well as significantly decreased at $P<0.01$[19]. That results are agreed with our finding before applying of instructional program in which physical domain recorded a relative sufficiency (72.2 %), while decreased after applying was recorded (56.4%), and shows a positive change in health promoting behaviors significantly of clinical factors, such as anorexia, dizziness and others concurrent with DOTS adherence.

With respect to subject "specific QoL- Psychosocial Domain", a studyby Ran Lee S. in South Korea 2015, that indicated psychological status of TB patients also effected by fear, depression, and anger, most commonly expressed emotion was fear, like fear of diagnosis, symptoms and treatment (Ran Lee, 2015). The present study is in agreement with finding of TB affects before applying of instructional program, with relative sufficiency (70.3%) while after applying suggested program, patients responses were decreased and recorded a relative sufficiency (58.7%), and shows positive changing and that explaining effectiveness role of the suggested program combined with adherence of "DOTS" which were succeed to change patients response about psychosocial status.

With respect to subject "specific QoL- Functional Domain" a study by Atif *et al*. in Malaysia 2011, found that TB adversely affected person's ability to function at work, either at home or in society, and other international studies show that TB can result in job loss that lead to family members assumed extra responsibilities in the home (Atif et al., 2014). The present study is in agreement with finding of TB affects before applying the suggested of instructional program, and recorded a relative sufficiency (73.0%), and after applying suggested program, patients were reported a little bit changes of responses (70.5%) indicating no significant different at P-value >0.05.

Regarding to subject "Specific QoL-Emotional Domain" a study by Xavier P. and Peixoto B. in Angola 2014, pointed out emotional distress expressed in terms of anxiety and depression are important extent on the burden and disability of TB, and they are closely related to the severity of symptoms, number of reports, higher rates of health services use, low treatment compliance, more extensive course of treatment, reduced control of the disease, and till death (Xavier and Peixoto, 2015). In agreement with result of study by Araújo G. *et al*. in Pakistan 2014, which determined that high percentage of TB patients from an outpatient clinic had anxiety and depression (Araújo et al., 2014). The present studies are in agreement with finding of the disease affects before applying the suggested of instructional program in which emotional domain was lower than other domains with relative sufficiency (48.0%), and after applying suggested program patients were reported a little bit improvement of responses and relative sufficiency decreased to reach (34.4%), and that explaining effectiveness role of suggested program combined with adherence DOTS succeed to change patients response about their emotional status.

Regarding to subject "Specific QoL-Extreme well-being domain" and "Personal Safety domain" a study by Irwin R. *et al*. in USA 2002, pointed out among 154 chronic coughers patients extreme well-being domain score during pretreatment period was (8.13) personal safety score (6.38), they were significantly lower post treatment (4.29) and (4.21) for each, duo to cough had disappeared as a complaint than it were prior to treatment[(23)]. In agreement with finding of our study before applying the suggested of instructional program, in which extreme well-being relative sufficiency score (53.8%), and personal safety relative sufficiency score (72.4%) after applying instructional program patients were reported improvement of responses and relative sufficiency score recorded (42.3%) for extreme well-being domain and (54.2%) for personal safety domain. explaining the effectiveness role of instructional program combined with DOTS adherence succeed to increase patients improvement in well-being and safety.

RECOMMENDATIONS

1. Suggest to applied the instructional program in all consultation clinic for chest and respiratory disease and its coordinator tuberculosis units after training specialized staff,
2. reducing the crowding index and enhancing the economic status for patients through governmental commitment by offering financial supports and food supplements to all patients,
3. we suggest to do similar researches about this subject in the future.

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