Adherence to Tuberculosis Treatment: Programmatic Vulnerability Elements

ORIGINAL

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Abstract

Introduction: Tuberculosis remains as a serious public health problem, and the current challenge is to find effective solutions that facilitate adherence to the treatment.

Objective: Describe the distribution of the adhesion markers scores to treat tuberculosis, related to aspects of programmatic vulnerability.

Methods: This is a cross-sectional study with a quantitative approach, which included 39 patients with tuberculosis, developed in the city of Campina Grande, Paraíba, Brazil. Data were collected in March 2015, through a structured interview with an instrument containing 32 adherence markers, applied in the reference clinic for tuberculosis or in the patient's residence. A descriptive analysis was performed using 12 markers expressing programmatic vulnerability elements, divided into two areas: structure and dynamic aspects of health services organization, and implementation of actions.

Results: It was observed similar patterns of scores distribution in the two axes of analysis, with higher medians and larger variations to score 3. The markers that showed more score 1, implying in a low adherence potential, were 'patient's residence visit', 'time for diagnosis' and 'treatment difficulty relative to the public health system'. The more positive contribution on the potential accession was the bond markers.

Conclusion: The distribution of scores pattern shows to be related to the centralized attention model to tuberculosis adopted by the municipality, and suggests the interconnection of the markers.

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Introduction

The major changes in the tuberculosis (TB) treatment were due to technological advances related to the discovery of prevention, treatment and cure supplies [1]. TB also remains as a serious public health problem. In Brazil, the number of individuals infected with *Mycobacterium tuberculosis* is about 57 million people, placing the country in 16th place in the ranking of 22 countries that concentrate 80% of the disease burden [2, 3]. In 2014, the number of new cases diagnosed in the country was 67.966, resulting in the incidence rate of 33.5 cases of TB for every 100.000 inhabitants [2].

One of the biggest obstacles that hamper TB control is multidrug-resistance resulting from inappropriate treatment or abandonment of it [4], and the biggest challenge is to find effective solutions that facilitate the treatment adherence [5-8]. In addition to affecting the clinical conditions of the patient, the non-adherence to treatment affects their life quality, worsens the disease, prolongs infectivity and entails the need for more complex procedures and higher costs [6, 8].

Treatment adherence is a major factor in the disease outcome, especially healing or abandonment [9, 10]. High adoption rates to treatment resonate with high percentages of cure, and function as an indicator of the quality of the health service, translating compliance protocols and the positive level of competence of the health team [9].

Complex, multi-causal and dynamic, the treatment adherence goes beyond the clinical and biological aspect, comprising the health/disease process in its historical and social production, including all of the phenomena that make up social reality [4, 6, 7, 11]. The methodological design of treatment adherence is to identify the aspects that provide peculiarities and specifics in their interpretation, revealing potential to achieve the treatment [12].

The decision to join the treatment involves issues that go beyond the regular intake of drugs. It comes from the interaction of various factors and involves

challenging circumstances, which often escape the patient's control [6, 8, 10, 13]. Adherence implies a shared responsibility chain that involves the patient, health professionals, social outlook and health services [6, 7, 8, 14].

The interpretation of adherence to health interventions must connect three plans: the plan referred to the concept of health/disease of the sick person; the relation plan occupied by the patient; and the plan that gives the health production process [12].

The third plan refers to the production process of health services, where the technology that allows the capitation of health needs is fundamental, which is possible by an qualified hearing, in the bond emanating from the meetings, establishing symmetrical and non-domineering relationships, seeking the autonomy of subjects in the construction of the treatment plan [12].

The main aspects of health services on the programmatic dimension of vulnerability which influence the membership are: access, patient relationship with the professional, long queues, the distance from home to the service, the availability of transportation means, the number of tablets, inaccessibility and cost of medication and treatment directly observed, among others [6, 7].

The knowledge of the factors associated with treatment adherence has fundamental importance for the redirection of strategies that guide health actions, with the aim of enhancing the healing and not to spreading the disease [7]. In this sense, the present study aimed to describe the distribution of the scores of adhesion markers to treat tuberculosis, related to aspects of program vulnerability, in the city of Campina Grande–Paraíba, Brazil.

Methods

This is a cross-sectional study, with a descriptive and quantitative approach, representing a cut in the multicenter research project entitled "Adherence to Tuberculosis Treatment: Implementation of Markers

for Patient Monitoring", whose goal is to implement a tool that enables detecting vulnerability elements adherence to TB treatment in the framework of the Primary Health Care intention, in two regions of Brazil: Southeast, São Paulo-SP, and the Northeast, Campina Grande-PB.

It was developed in the city of Campina Grande, Paraíba, Brazil, located 133 kms from its capital, João Pessoa, the second most populous city in the state, with a population of 402.912 inhabitants [15]. The city is considered a priority in TB control by meeting the criteria established by the Technical Note N°15/2011 CGPNCT/DEVEP/SVS/MS [16]. In 2013 the incidence of new cases of TB was 39.9 per 100,000 people, with 13.1% of treatment waiver.

The studied population consisted of patients with TB in anti-TB treatment, diagnosed from September 2014 to February 2015. The sample was type census, where 53 representative subjects of the population were eligible for its composition. The inclusion criteria was: age less than 18 years resident in the city of Campina Grande, Paraíba, Brazil, having oral communication skills and understanding preserved and at least 30 days anti-TB treatment in the period of data collect. Patients institutionalized in the prison system and in the hospital system out of the city of Campina Grande, Paraíba, Brazil, were excluded. After considering the inclusion and exclusion criteria, the sample was composed of 39 participants.

Data were collected in March 2014 through a structured interview, held at the municipal ambulatory reference in TB, while waiting for the medical consultation or in attendance for observed intake of medicine or in the patient's home, as this convenience.

The applied instrument has been validated to be adopted under the Primary Health Care (PHC) [18, 19], consisted of two parts: the first one related to the participants socioeconomic and demographic aspects, relating to the health-disease process and the outcome of treatment. The second one containing 32 adherence markers, according to

five dimensions: living conditions, vulnerable contexts, the health-disease process and health services treatments.

The concept of adhesion markers is divided into qualitative flags of vulnerability elements in adherence to treatment; functioning as "alarm sentinels" with the potential to trigger appropriate interventions [19]. Thus, for each marker there are three possible answers that are related to scores one, two or three. The lower scores indicate lower potential for treatment adherence.

In this article it was selected as units of analysis the markers expressing programmatic vulnerability elements, totaling 12 markers, which were relating to the health-disease process, treatment and health service dimensions; and they were analyzed according to two axes: structure and dynamic aspects of the organization of health services, and implementation of actions. **Table 1** shows the markers that make up each axis and their scores.

Data were tabulated in a *Microsoft Office Excel 2003* spreadsheet, and conducted a descriptive analysis, with calculation of absolute and relative frequencies of the scores for the 12 markers. Box-plot graphs were constructed for each of the analysis axes to allow observation of the dispersion in each of them, the relative frequencies of the set of markers of their scores.

The research project was submitted and approved by the Research Ethics Committee (CEP) of the State University of Paraíba, Brazil, with the number 34560114.7.2001.5187.

Results

In the structure and dynamics axis of the organization of health services, the marker that had the score one as the most frequent was 'difficulty to treat relative to the health service support'; and in the markers 'time spent to go to the Health Unit' and 'time to attend the Health Unit', the score three was the highest percentage. Despite the treatment

Table 1. Programmatic markers of adherence to tuberculosis treatment.

Analysis axis	Marker	Answers	Scores
Structure and organization aspects of the health services dynamics	Treatment condition	Relapsed/Retreatment Abandonment/ Bankruptcy	1
		Transfer	2
		New Case	3
	Treatment modality	Self-administered	1
		Directly Observed Treatment up to 3 times a week	2
		Directly observed treatment by up to 5 times a week	3
	Difficulties in treatment in relation to the health service supporta	No support	1
		Sometimes professional supports and incentives	2
		Professional always supports and incentives	3
	Time spent to go to the Health Unit	> 1 hour	1
		30-60 minutes	2
		<30 minutes	3
Actions operationalization	Number of popular services to make the diagnosis	> 1 hour	1
		30-60 minutes	2
		<30 minutes	3
	Time taken to be attended in a Health Unit	> 1 hour	1
		30-60 minutes	2
		<30 minutes	3
	Time to get diagnosed	≥ 3 Health Units	1
		2 Health Units	2
		1 Health Unit	3
	Feeling that is being heardb	> 1 month	1
		16-30 days	2
		≤ 15 days	3
	Be served by the same health professional during treatmentb	Not heard	1
		Sometimes heard	2
		Always heard	3
	Asking questions to the health service frequencyb	Never	1
		Sometimes	2
		Always	3
	Intent on the continued realization of the treatment at the Health Unit	Never	1
		Sometimes would do the treatment in another health unit	2
		Would like to continue treatment in the same Health Unit	3
	Reciept home visits	Never	1
		Only once	2
		Sometimes	3

^a Time spent and incentives to be attended in the Health Unit

condition that most appeared was "new case", option that represents the score three retreatment after abandonment was also worth mentioning, as the percent of 12.8%, and this situation, which is expressed by a score, set high vulnerability to non-adherence to treatment.

For operationalization of activities axis, the markers 'receiving home visits' and 'time to get diag-

nosed' were the most voluminous for a score, while 'be served by the same health professional during treatment' and 'intent on the continued realization of treating Health Unit' were the markers to score three more. **Table 2** presents the distribution of each marker.

In the boxplots (**Figure 1**), it was observed for the two axes in question, higher and larger va-

Table 2. Distribution of programmatic markers of adherence to treatment related to scores, Campina Grande-Paraíba, Brazil, in 2015.

Analysis axis	Marker	N	Scores					
			1		2		3	
				%	N	%	N	%
Structure and organization aspects of the dynamics of health services	Treatment Condition	39	5	12.8	0	0	34	87.2
	Type of treatment	39	18	46.1	15	38.5	6	15.4
	Treatment difficulties in relation to the health service support	39	29	74.4	1	2.6	9	23.1
	Time spent to go to the Health Unit	39	2	5.1	6	15.4	31	79.5
	Time spent to be served at the Health Unit	39	3	7.7	1	2.6	35	89.7
Actions operationalization	Number of services sought to establish the diagnosis	39	15	38.5	17	43.6	7	17.9
	Time to get diagnosed	39	21	53.8	6	15.4	12	30.8
	Feeling that is being heard	39	3	7.7	7	17.9	29	74.4
	Be served by the same health professional during treatment	39	0	0	3	7.7	36	92.3
	Asking questions to the health service frequency	39	6	15.4	6	15.4	27	69.2
	Intent on the continued realization of the treatment at the Health Unit	39	4	10.3	0	0	35	89.7
	Receipt domiciliary visit	39	22	56.4	3	7.7	14	35.9

Figure 1: Distribution of frequencies that scores of markers, relating to areas: aspects that structure and dynamic of the organization of health services (a) and operationalization of actions (b).

riations in median score three, the score two was the more concise and the one that had less variation, suggesting the targeting of markers for score one or three, but showing dispersion for specific markers viewed by relative outliers for the markers 'treatment modality' in the chart (a) and 'number of services sought to establish the diagnosis' in the chart (b). The score one, despite a median of less than 20%, shows great variability in the distribution of frequencies, reaching values close to 80%, demonstrating the need for action in these markers, for lifting their scores.

Discussion

The structure and dynamics of health services organization provide the necessary conditions for the satisfaction of health needs of individuals, intervening in TB treatment adherence potentials, constituting in programmatic vulnerability of elements that enhance or weaken the process. In this axis, the 'time spent to go to the Health Unit' and 'time to attend the Health Unit' markers showed the highest frequency in score three, indicating upside potential for to TB treatment adherence.

The waiting time reduction for consultation is a reflection of better organization of health and professional services [9]. Often, despite having optimized this time, there is incompatibility between the hours of operation of health services and user uptime, causing absenteeism [6].

It is commonly believed also that the distance from the health service is an impediment to treatment adherence. Munro and collaborators [6] observed more regular treatment among users living next to the health unit. However, regarding adherence to tuberculosis treatment, many studies already point to the opposite direction, since the patient often prefers treatment far from home, because they feel more comfortable and incur less risk of suffering from the stigma of the disease in the neighborhood [9, 20].

On the other hand, the completion of TB treatment in a distant health service can hinder the implementation of actions, such as the home visit, which obtained high percentage of score one. And when this action took place, summed up the visit of the health worker, getting other health professionals to know about the process. This fact reflects the weakness in carrying out home visits to TB patients in the city of Campina Grande, Paraíba, Brazil.

In a study of Hino and collaborators [10], home visit was recognized as a need by health professionals and patients with TB. It is the medium that makes possible to know the family background of the individual and strengthens the bond between the healthcare team, the patient and their family, enabling continuous care, being important to detect issues that may hinder or prevent the achievement of treatment in appropriate order [9, 10].

It is observed also that the good relationship and the bond between healthcare professionals are crucial in regard to geographic accessibility, in the choice of health care [7]. In this study, the link was evaluated by markers 'feel heard', 'be served by the same health professional during treatment' and 'frequency uses of the health services in case of questions'; all showed high percentages in score three, depicting potential for adherence to tuberculosis treatment.

The formation of bond between the healthcare team, the patient and his family is fundamental to the disease understanding and treatment, as well as the importance of taking care of health [10]. It is assumed that the more knowledge about the health/disease process, the greater the chances of adherence to treatment [5].

The bond establishment is a basic element of the therapeutic process and facilitator of assistance to TB [10]. It is related to the care practice, translated into concern attitudes, interest and attention. When the patient feels valued, there is a recognition of the health professionals as partners in the recovery

of his health, and consequent encouragement of adherence [1, 7].

In addition to the bond, adherence to TB treatment relates to the supply of basic food type incentives, public transport and sickness aid [4, 8, 9, 13]. These aspects represent weaknesses to the reality studied, with high frequency in the score 1.

Sometimes, failures in providing these incentives are so great that demand operationalization reorientation of activities to enable the follow-up treatment. The experience reported by Cruz et al [11], exemplifies this type of situation, where the lack of distribution of vouchers did not allowed the realization Directly Observed Therapy Short-Course (DOTS), having to move to self-administered treatment in order to ensure continuity of treatment.

The DOTS is a treatment modality that is an important element to enhance treatment adherence. In addition to ensuring that drugs are ingested properly, the DOTS enables the approach of the social context of individuals and the establishment of bond [6, 7]. In the studied reality, this marker is an important point to be enhanced, as is highly frequent in self-managed mode (score one) or supervised up to three times per week (two scores). It is important that this modality be strengthened and enhanced to the condition that determines the score three.

The treatment condition is another important marker that deserves attention. The negative perceptions acquired by previous experience of treatment for TB may result in behavioral attitudes, which increases the likelihood to discontinue the treatment or to adhere in unsatisfactory levels [7, 8].

The markers that showed weaknesses in the actions operationalization were: 'number of popular services to make the diagnosis' and 'time to receive the diagnosis', as the scores presented suggest that patients are plotting inefficient trajectories for the diagnosis of TB and consequent long time to establish the diagnosis. The delay in the TB diagnosis

delays the onset of treatment, and is a negative potential to its achievement [7].

It is not possible to predict the adherence only by the patient's behavior, but by comprehension of living and the inter-relationships phenomenon in which develops the treatment process. Regarding the programmatic aspects, it is noted that the markers that indicate the potential adherence are interconnected, so that the improvement of one affect also the others improvement.

The two axes analyzed showed similar profiles, not signaling the need for focused actions specifically to one of them. The markers also tended to have the little variability in scores, which may reflect the centralized model of care to TB in the city.

The weaknesses highlighted in markers require the need of intervention, such as the realization of home visits and support from health services, granting benefit type basic food and transportation vouchers. Whereas the markers that revealed positive potential for adherence, following the example of those reflecting the bond, should be encouraged and strengthened, in order to maintain this beneficial aspect and spread to other health services.

The distribution of scores pattern shows to be related to the centralized attention model to tuberculosis adopted by the municipality, and suggests the interconnection of the markers. To improve the picture of the markers is essential that health services are structured in a broad and decentralized manner to meet the patients' health needs.

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