Psychological factors related to Buruli ulcer and tuberculosis in Sub-Saharan Africa
Alferink, Marike

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CHAPTER 3

ILLNESS PERCEPTIONS AND PATIENT DELAY AMONG NEWLY DIAGNOSED TUBERULOSIS PATIENTS FROM THE KANO REGION, NIGERIA

SUBMITTED

Marike Alferink
Ahmed M. Bello
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Adelita V. Ranchor
ABSTRACT

Delay in seeking treatment at the hospital is an important problem in Tuberculosis (TB) control. It affects the prognosis of the patient as well as the transmission within the community. Previous studies showed different individual and health systems factors to be related to delay, however, these studies did not quantitatively assess patients’ beliefs and perceptions related to delay when experiencing symptoms. Therefore, this study aimed to gain more insight into the relationship between illness perceptions and patient delay in a TB population by adopting a quantitative approach in which factors previously related to patient delay were taken into account. 128 newly diagnosed TB patients from the Kano region in Nigeria, who were visiting the hospital for the first time were included in this cross-sectional interview. Patients were included when they had a confirmed diagnosis of TB, aged between 16 and 65 years and able to speak English or Hausa. Measures included delay, treatment choice, illness perceptions (IPQ-R), and basic characteristics. 25% of patients delayed less than four weeks, 37% delayed four to 12 weeks and 38% delayed more than 12 weeks. TB patients perceived their disease to be acute, and felt highly in control over their disease and treatment. Patients did not fully understand their disease, and associated it with many negative emotions. TB patients believed in causes such as ‘from God’, ‘taking cold drinks’ and ‘air pollution’. The majority of patients used two to three other types of treatment before presenting at the hospital; mostly the Patent Medicine Vendor, self-treatment, herbalist or mosque. Patient delay was related to unemployment and negative emotional representations. Our findings add to the literature the relationship between delay, employment status and emotional representations in TB. This novel information provides tools for program managers and health care providers to reduce delay among TB patients.
INTRODUCTION

Tuberculosis (TB) is the second leading cause of death from an infectious disease worldwide, with an incidence rate of 118/100000 population in high burden countries such as Nigeria [1]. Most frequently experienced symptoms of pulmonary TB are cough with -sometimes bloody- sputum, fever, night sweats and weight loss [2]. Diagnosis in Nigeria is clinical case detection followed by sputum smear microscopy. The Nigerian National Program recommends treatment following the Directly Observed Treatment Short-course (DOTS) strategies which rely greatly on passive case finding for tuberculosis treatment. In order to reach the global WHO targets of reducing the prevalence and death rates of TB by 50% in 2015, early diagnosis and treatment in Nigeria is needed [1].

Treatment is most successful when appropriate care is provided shortly after experiencing symptoms [3], however, previous studies show that in Nigeria, more than 80% of patients delay for more than four weeks before reporting to the hospital [4]. Patient delay is defined as the time interval (in days) from the onset of cough with or without the other symptoms of TB to the time of presentation at the hospital, and a time period of one month is typically used as a cutoff for delay [5]. Patient delay affects the prognosis of the individual as well as the transmission within the community.

Theoretically, the way patients perceive their illness, i.e. their cognitive and emotional illness representations, affect the way patients cope with the illness [6-9]. This is described by the Common Sense Model (CSM) [10], which states that individuals held a personal view on a certain illness, consisting of cognitive and emotional beliefs. A widely used instrument to measure illness perceptions quantitatively, is the Illness Perceptions Questionnaire-Revised (IPQ-R) [11]. This instrument consists of eight cognitive, and one emotional dimension, namely identity (the perception of what the illness is, symptoms and label), cause (perceived cause), consequences (beliefs about effect and impact), control/cure (beliefs about controllability and potential for cure, divided into personal and treatment control), timeline (the course and duration of the illness, divided into cyclical and acute/chronic timeline), illness coherence (the overall understanding of the illness) and emotional representations (affective responses to the illness). This view leads how people respond to it, e.g. ignore the symptoms, seek treatment or not. Illness perceptions are built up by different sources of
information, such as information from friends and relatives, experiences from close others and the media. This implicates that illness perceptions are subjective and not necessarily in line with objective knowledge in the medical literature.

Empirical support for the illness perceptions model was found for a variety illnesses [6] and various outcomes such as coping [45], self-management [12,13], help seeking [14], medication adherence [15,16], wellbeing [16] and quality of life [17].

To our knowledge, there are currently no studies conducted in Africa, using the illness perceptions questionnaire among TB patients. There is one study on illness perceptions and delay performed in an African population which showed that perceiving more personal control and perceiving treatment as more effective was related to more patient delay in Buruli ulcer [18]. Another study comparing German and South African HIV patients’ illness perceptions, showed different patterns of inter-correlations between illness perceptions subscales in the two groups [19]. In a study from Russia on the relationship between illness perceptions and delay in TB, the perception of what TB is (illness identity) was significantly related to delay [20].

Despite the potential of illness perceptions to explain patient delay, literature reports several health systems factors (resources, availability of professionals, geographical barriers) as well as individual factors (demographics, health seeking behaviors, knowledge about the illness). Individual factors such as female gender, residing in rural areas and low socio-economic status were related to more patient delay in a large review delay among Chinese TB patients [21]. Results of a study from rural Nigeria were different, namely that that male gender, older age and a lack of formal education were related to a longer delay [22]. Other studies confirmed that living in a rural region is likely to be related to delay [5,23]. Health seeking behaviors, such as consulting a health care provider which does not diagnose correctly was related to a prolonged delay. [4,5,21,22,24,25]. In Nigeria, Especially the Patent Medicine Vendor (PMV), which is a person without formal pharmacy training who sells orthodox pharmaceutical products, is often turned to [26,27]. Furthermore, knowledge and beliefs such as a lack of understanding of the cause of TB [28], poor awareness of TB [21] and incorrect interpretation of symptoms [5,29] were related to delay.
Previous studies that focused on perceptions or beliefs about tuberculosis TB in African groups, mainly used a qualitative approach [30-32], non-standardized questionnaires [23,33], non-patient populations [34] or other approaches. A qualitative method is highly informative, however it cannot be used to test relationships with delay. Non-standardized instruments limit the comparison of the results with findings of others, and non-patient populations are only useful to function as a proxy for (possible future) patients.

This study was the first examining illness perception of TB patients from rural Nigeria and the relationship with patient delay, while taking other factors previously related to delay into account, such as treatment choice and socio-demographic factors. This approach may help to better understand patient delay and eventually, improve early presentation.

METHODS

Ethical clearance

The Kano State Hospital Management Board in Nigeria (KHMB) approved the study. Permission was obtained from the Chief Medical Officer of the Infectious Diseases Hospital (IDH), where the study was carried out. Oral informed consent was obtained from all participants.

Sample

Data for this cross-sectional study were collected between January and March 2010 in the Kano State Hospital in Northern Nigeria. The study sample consisted of newly diagnosed patients visiting the Infectious Diseases Hospital for the first time for treatment for their TB symptoms. Patients were included when they had a confirmed diagnosis of TB, were aged between 16 and 65 years and able to speak English or Hausa.

Procedure

Diagnosis and therapy in standard care

Diagnosis of TB was based on clinical case detection and confirmation by sputum smear microscopy. Upon arrival at the hospital, patients explained their symptoms to a doctor, after which they were directed to the laboratory for a
sputum smear microscopy test. When patients were confirmed and diagnosed with a positive test for the presence of acid- and alcohol fast bacilli in their sputum, they were referred for HIV-screening. All of these procedures are part of standard care. After screening, patients were referred to the researcher on site to check the inclusion criteria for the current study.

**Interviewers and translation**

Data were collected by structured interviews in English or in the native language of Hausa, performed by one of the authors (AMB) and a nurse who was related to the IDH. The nurse received an interview training, including a discussion about the informed consent process and interview techniques. The questionnaire was translated by two bilingual Hausa–English translators, who independently translated the English questionnaire into Hausa. A committee, comprising of the two translators and the second author, met to compare both versions of the translated questionnaire and reconcile differences to retain the meaning of the original questions.

**Data collection and measurements**

All interviews were held in private rooms attached to the hospital. Age, gender, marital status, educational and employment status, region and location of living (village, city) were assessed by open and closed questions.

**Patient delay**

Participants were asked to recall (in days) when symptoms of their current cough episode first started. In order to improve accuracy of recall, patients were asked about their illness in general and then specifically about their symptoms. Delay was categorized into group 1 ‘no delay’: patients reported to the hospital within 4 weeks (0-28 days); group 2 ‘moderate delay’: patients who reported to the hospital from 4-12 weeks (29-84 days) and group 3 ‘severe delay’: patients who reported to the hospital after 12 weeks (>85 days), since we further wanted to distinguish moderate from severe delay.

**Treatment choice**

Patients were asked whether they sought help before presenting at the hospital, and if so, where this help was sought and in which order different treatments were sought.
Illness Perceptions

Illness perceptions were measured using the Revised Illness Perception Questionnaire (IPQ-R) [11]. According to the Common Sense Model, the illness representation is buildup by five dimensions, which can be measured by the IPQ-R using eight subscales. **Identity** is a list of symptoms the patients ascribes to his/her illness. **Illness coherence** reflects to what extent the person feels he/she understands the illness, for example, “My TB is a mystery to me.” **Cure/control** refers to beliefs about personal abilities to control the illness and the efficacy of the treatment to cure or manage the illness. **Cyclical timeline** refers to beliefs on the fluctuation in symptoms and the temporal changeability of the illness, for example, “My symptoms come and go in cycles.” **Acute/chronic timeline** refers to the relative chronicity of the illness, for example, “My TB is likely to be permanent rather than temporary.” **Consequences** is concerned with the effect the illness would have on daily life, family, and finances, for example, “My illness has serious financial consequences.” **Causal beliefs** refer to personal ideas about the cause of TB. **Emotional representations** represent affective responses that are related to differences in illness perceptions, for example, “When I think about my TB, I get upset.”

The IPQ-R is flexible in adapting to the disease under study; therefore, seven symptoms used previously with the IPQ-R in TB [20] were added to the identity subscale. Similarly, the causes scale was extended with 9 causes previously described, such as ‘evil spirits’, ‘from God’ and ‘air pollution’ [32,35]. Ratings for the IPQ-R items range from **strongly disagree** (0) to **strongly agree** (4). High scores on the identity, timeline acute/chronic, consequences and cyclical domains represent pessimistic beliefs about TB. A high score on control domains and illness coherence domains reflect optimistic beliefs about the disease. A total score per subscale is used to indicate each of the perceptions. Previously reported alpha coefficients for the subscales ranged from 0.79 to 0.89 [11].

The psychometric properties of the IPQ-R were tested by using a Multiple Group Method (MGM) analysis, which is a simple form of Confirmatory Factor Analysis for small samples [36]. All items clustered together similar to Moss-Morris et al. [11], except for item 6 and 17. In order to maintain consistence with other studies we decided to keep the original item grouping [11], which explained 60% of the observed variance of the IPQ-R. This is comparable to the 64% of explained
variance found previously [11]. Reliability analysis on each of the eight subscales resulted in high item-test correlations and alpha coefficients ranging between .63 (illness coherence) and .91 (emotional representation). Sub-dimensions of the IPQ-R showed patterns of inter-relations which were in line with the literature [11]. The psychometric properties of the causes scale were analysed separately, as recommended by the developers of the questionnaires [37]. A Multiple Group Method (MGM) analysis was performed, resulting in five similar factors to the study by Woith et al. (2008) among TB patients from Russia [20]. These factors were respectively, ‘personal behavior’, ‘emotional burnout’ ‘uncontrollable circumstances’, ‘insufficient self-care (demoralization)’ and ‘misfortune’, explaining 45.3% of the variance (data available on request).

Statistical analysis

Analysis was performed using the Statistical Package for Social Sciences (SPSS) for Windows version 20.0. Data was inspected on outliers, missing values and violations of assumptions. Outliers on the items of the IPQ-R were examined on whether they were influential and missing values were handled according to existing guidelines [37].

The highly skewed causal perceptions were re-categorized into 1 = Strongly disagree/disagree, 2 = Neither disagree nor agree and 3 = Agree/ Strongly Agree, in order to prevent expected cell counts <5. IPQ-R subscales were presented with mean item scores, ranging from 0 to 4, where scores >2 indicated agreement with the perception on a group level.

The subscales ‘timeline (acute/chronic)’, ‘personal control’ and ‘treatment control’ were not normally distributed, so a non-parametric correlation (Spearman’s rho) was used to examine relations with the ordinal outcome variable ‘delay’ (3 groups). Correlations between causal items and delay were examined by using Goodman and Kruskal's gamma, correlations between the other IPQ-R subscales and delay were examined by Spearman’s rho. Chi-square statistics were computed among socio-economic variables and delay.

All variables independently related to delay from the bivariate analyses were entered univariately to a logistic regression analysis. Variables with $P$-value $\leq 0.2$ were entered into the multivariate logistic regression model. All the redundant
predictors were stepwise removed, based on the pseudo $R^2$ measures and the significance of the regression parameters.

A multinominal logistic regression analysis with delay (3 groups) as the outcome was compared to a logistic regression analysis with delay being dichotomized into no delay (0-4 weeks) and delay (>4 weeks). Results were similar, and therefore, the logistic regression analysis with the dichotomized outcome was presented. For the fit of the model, we used the model -2 Log-likelihood test and the pseudo $R^2$ measure of Nagelkerke. Nagelkerke’s $R^2$ measure is comparable to $R^2$ in OLS regression analysis, however, its value is generally lower than in OLS models.

RESULTS

Patient characteristics

An overview of patient characteristics and background variables are presented in table 1. One hundred and twenty eight patients, with a mean age of 31.8 ± 12.9 years (range 16 - 65) were included. Fifty seven percent of patients (n = 73) were male, 53.9% (n = 69) were married and 51.6% (n = 66) were employed. 36.7% of patients (n = 47) never attended school and 47.7% (n = 61) finished secondary school or more. Knowledge on TB was generally low; ⅔ of the patients had heard of TB, while ⅓ knew that coughing up blood was one of the symptoms. Half of the patients knew that TB is a transmissible disease and 42% knew it is treated free of charge.

Patient delay

25% (n = 32) of patients showed up at the hospital within four weeks after the onset of symptoms (no delay), 36.7% (n = 47) showed up between 4 to 12 weeks (moderate delay) and 38.3% (n = 49) showed up after more than 12 weeks (severe delay).

Treatment choice, association with delay and advice from others

105/128 patients (82%) used other treatments before presenting at the hospital. Patients chose between 1 (39%) and 5 (4.8%) types of treatment before presenting at the hospital. Patients in the severe delay group chose on average 3 different treatments, compared to 2 treatments in the non-delay and moderate delay group.
Figure 1 illustrates all treatment choices patients made, with the most used types of treatment before presenting at the hospital being the Patent Medicine Vendor (PMV), self-treatment, the herbalist and the mosque. The type of treatment patients chose did not differ between delay groups, with exception of the choice for the herbalist, which was significantly higher for the extreme delayers ($\chi^2 (df=2) = 14.93, p =.001$). There was no typical pattern or order found for the choices for treatment. Friends ($n = 100 (87.1\%)$) and family ($n = 43 (39.4\%)$) advised the patients most often to go to the hospital, and especially the advice of family ($n = 91 (71.1\%)$) was decisive.

Illness perceptions

Over 75% of patients ascribed the symptoms of weight loss, chest pain, loss of strength, persistent cough, fatigue or elevated temperature to their TB. 88% of the patients perceived the causal factors ‘from God’ as a likely cause of TB. Taking cold drinks and air pollution were perceived as the second and third most likely causes of TB. Mean total scores on the IPQ-R subscales are presented in table 2, with high scores on the timeline cyclical, personal control and treatment control and emotional subscales and low scores on the timeline acute/chronic, consequences and illness coherence subscales.

Associations between delay, socio-demographic factors, treatment choice and IPQ-R

The relationship between delay (3 groups) and socio-economic and background variables was examined, and delay did not differ significantly by gender ($\chi^2 (df=2) = 4.21, p = .12$), age, ($r_{spearman} (r_s) = .07, p = .43$) and marital status ($\chi^2 (df=2) = 2.88, p = .24$). Only employment status ($r_s = -.22, p = .02$) was significantly related to delay.

A longer delay (3 groups) was associated with perceptions of a cyclical timeline, serious consequences, and emotional representations. Pain as an experienced symptom was related to delay ($r_s = .19, p = .03$). None of the causes subscales was related to delay. In the logistic regression model, the individual predictors significantly related to more delay were unemployment and negative emotional perceptions (table 3).
DISCUSSION

In this study on illness perceptions, treatment choices and delay among newly diagnosed TB patients from Nigeria, it was found that 25% of the patients delayed less than 4 weeks, 37% delayed four to 12 weeks and 38% delayed more than 12 weeks. The majority of patients used two to three other types of treatment before presenting at the hospital; mostly the Patent Medicine Vendor (a person without formal pharmacy training who sells orthodox pharmaceutical products), self-treatment, the herbalist, or the mosque. Weight loss, chest pain, loss of strength, persistent cough, fatigue and elevated temperature were common perceived symptoms related to TB. The causal factors from God, taking cold drinks and air pollution were perceived as the most likely causes of TB. Regression analyses showed that delay was related to unemployment and negative emotional representations. This information is valuable for health care practice while it also provides input for an effective TB control programme.

Delay and treatment choices were in line with previous studies from Nigeria [22, 28]. Median patient delay in a recent study from the Ebonyi State in the southeast of Nigeria was 8 weeks [22], which is comparable to the results of our study. Of the 450 included TB patients from rural Nigeria, an average of four other health care providers were visited before treatment at a formal TB treatment center started, mostly pharmacies or drug shops [22]. Our study showed that the PMV was the most common other type of treatment before presenting at the hospital. This is in line with literature showing that PMV’s play an important role in rural and urban communities in Nigeria since it is a cheap and readily available health care option [26]. A study conducted in the south of Nigeria concluded that the current knowledge and level of training of PMVs is low; almost half of the PMVs did not know the cause of TB and only a small percentage would send their patient with suspected TB to a laboratory for diagnosis [26]. A report of Berendes et al. (2012) on the role of PMVs in antimalarial treatment in the Northwest district of Nigeria stresses the need to improve quality of treatment of PMV’s [38]. Further research should focus upon possible ways to involve PMV’s in TB control activities. Onyeneho et al. (2010) noted several opportunities to involve PMV’s in TB control, such as using their skills in handling clients with different ailments, benefit from their acceptance in the community and utilize the fact that their way of working is in line with that of the national TB control programs [26].
Symptoms such as fatigue and chest pain were perceived as part of their TB, which is useful information to explain the way patients label their illness. Symptoms mentioned were in line with those described in medical literature [39] and other studies on health beliefs in TB [22]. Patients in our study believed that God’s will and sin play a causal role in the development of their TB, a belief which is described previously in literature from Nigeria [5,33,40] and other African populations [31].

In general, patients perceived TB to be an acute illness, over which they perceived high personal and treatment control. Furthermore, patients did not have a coherent view on their TB and associated it with negative emotions. A high level of control means that patients felt that there was a lot they could do to control their symptoms, or influence whether their TB got better or worse. This is in contrast with a study on perceptions of TB among patients from northern Russia, who felt overpowered by hopelessness after noticing symptoms, leading to a delay in seeking treatment. They stress the passive position of the patients, in that people see themselves as victims rather than active agents for their own health [20]. Our study did not confirm these findings, which could be because of differences related to socio-economic or health system factors.

Causal perceptions such as from God, taking cold drinks and air pollution were mentioned as causes of TB, which is in line with a qualitative study from Rwanda, in which beliefs in a supernatural cause of TB were reported. Causal perceptions were not related to delay in our study, which was also found in a study on health seeking in TB in Manila (Philippines) [41]. They found that marital status was related to delay. Furthermore, from the qualitative part of their study, costs of medical treatment and harmlessness of symptoms were frequently mentioned as factors contributing to delay.

A study from Rwanda reported fear caused by the symptoms, which made some patients too afraid to seek early care [31]. The study by Auer et al. (2000) reported the tendency of patients to minimize the severity and dangerousness of TB, which is suggested to be a coping mechanism [41]. These findings are in concordance with our finding that delay was related to emotional representations. Emotional representations are known to enhance coping mechanisms such as avoidance or suppressing feelings and communication and that might have played a role in delay.
Delay was related to unemployment, suggesting that the patients in our study area were facing inequitable barriers to care. In Nigeria, unemployment is at a high level with about 24% of the population within the age of 15 - 64 being unemployed in 2011 [42]. This is worrisome and automatically accompanies the lack of health insurance and hence, difficulties in obtaining medical care. In Zambia, lack of source of income was a major contributory factor to patient delay [43].

**Limitations of the study**

The conclusions drawn from this study are limited to associations, because of the cross-sectional design of the study. Second, the retrospective bias with respect to the onset of symptoms, timing and order of consultations at different facilities might have affected the accuracy of reporting these events. Third, a selection bias might have occurred, as only one TB treatment center was included in the study. However, the IDH serves as a main reference hospital in the region where people from various parts of the country and of various occupations attend. Fourth, generalizability of the findings to other parts in Nigeria is limited, because only one treatment center was included, and because we were only able to interview TB patients who eventually sought help at the hospital. It is possible that their views and ideas do not reflect those of their counterparts who never reported to the hospital. And finally, the used diagnostic methods (clinical features, followed by radiography and sputum smear microscopy) could have led to misdiagnosis of patients with atypical clinical presentations, for example cases with HIV co-infection. However, experienced clinicians made the diagnosis of sputum smear negative TB cases, using the recommended diagnostic algorisms by the Nigerian Ministry of Health.

**CONCLUSION**

Our findings add to the literature the relationship between delay, emotional illness perceptions and employment status in TB, and confirms the importance of the PMV. This is the first study to use the Illness Perceptions Questionnaire Revised in relation to delay in Tuberculosis in Africa, providing information to health care practice and input for prevention programmes. We support the concern expressed by others [4,27,28,34,44] that there is a direct need for the TB
program to explore ways of engaging the ubiquitous PMV in order to decrease delay in obtaining appropriate TB care.

**Funding**

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**Acknowledgements**

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Table 1. Patients socio-demographic and clinical characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value (n = 128)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex, No. (%)</td>
<td>75 (57)</td>
</tr>
<tr>
<td>Age, mean, (sd)</td>
<td>31.8 (12.9)</td>
</tr>
<tr>
<td>Married, No. (%)</td>
<td>69 (53.9)</td>
</tr>
<tr>
<td>Level of educational, No. (%)</td>
<td></td>
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<tr>
<td>No education</td>
<td>47 (36.7)</td>
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<tr>
<td>Primary education</td>
<td>20 (15.6)</td>
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<tr>
<td>Secondary education</td>
<td>48 (37.5)</td>
</tr>
<tr>
<td>Post-secondary or University education</td>
<td>13 (10.2)</td>
</tr>
<tr>
<td>Employed, No. (%)</td>
<td>66 (51.6)</td>
</tr>
<tr>
<td>Location: City, No. (%)</td>
<td>116 (90.6)</td>
</tr>
<tr>
<td>HIV Status</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>5 (3.9)</td>
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<tr>
<td>Negative</td>
<td>102 (79.7)</td>
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<tr>
<td>Missing/unknown</td>
<td>21 (16.4)</td>
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<tr>
<td>Travel time to the hospital (min)</td>
<td></td>
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<tr>
<td>&lt; 30</td>
<td>68 (53.1)</td>
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<tr>
<td>30 – 60</td>
<td>37 (28.9)</td>
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<tr>
<td>60 – 120</td>
<td>18 (14.1)</td>
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<tr>
<td>&gt; 120</td>
<td>5 (3.9)</td>
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<tr>
<td>Health care payment, No. (%)</td>
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<td>Employer/Government</td>
<td>2 (1.6)</td>
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<tr>
<td>Self-pay (out of pocket)</td>
<td>65 (28.5)</td>
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<tr>
<td>Through spouse</td>
<td>27 (21.1)</td>
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<td>Through parents</td>
<td>25 (19.5)</td>
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<tr>
<td>Others</td>
<td>9 (7.0)</td>
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<tr>
<td>Knowledge on TB, Yes (%)</td>
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<tr>
<td>Have you heard of TB?</td>
<td>79 (61.7)</td>
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<tr>
<td>Does TB have the symptom of chronic cough?</td>
<td>79 (62.7)</td>
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<tr>
<td>Does TB have the symptom of coughing up blood?</td>
<td>42 (32.8)</td>
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<tr>
<td>Is TB a transmissible disease?</td>
<td>71 (55.5)</td>
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<tr>
<td>Can TB be treated for free?</td>
<td>54 (42.2)</td>
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<tr>
<td>Have you heard of a TB dispensary?</td>
<td>46 (35.9)</td>
</tr>
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Table 2. Associations\(^b\) between illness perceptions subscales and delay

<table>
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<th></th>
<th>Delay</th>
<th>1</th>
<th>2</th>
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<th>4</th>
<th>5</th>
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<th>8</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>(M^d)</th>
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<tbody>
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<td>1. Identity</td>
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<td>11.61</td>
<td>4.24</td>
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<td>2. Timeline (acute/chronic)</td>
<td></td>
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<td>1.11</td>
<td>0.83</td>
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<td>3. Timeline (cyclical)</td>
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<td>2.93</td>
<td>0.76</td>
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<td>4. Consequences</td>
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<td>1.09</td>
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<td>5. Personal control</td>
<td></td>
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Causes:

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<th>7</th>
<th>8</th>
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<th>C2</th>
<th>C3</th>
<th>C4</th>
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<th>SD</th>
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\(^a\) \(p \leq .05\); \(^b\) \(p \leq .001\); \(^c\) Correlation (Spearman’s rho); \(^d\) Mean total score of subscale / nr of item
Table 3. Logistic regression analysis on Delay

<table>
<thead>
<tr>
<th></th>
<th>B (SE)</th>
<th>p-value</th>
<th>95% C.I. for Odds ratio</th>
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<td>Constant</td>
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<td>.084</td>
<td>.34</td>
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<tr>
<td>Employment status (= employed, 0 = unemployed)</td>
<td>1.71 (.51)</td>
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<td>.56 (.19)</td>
<td>.004</td>
<td>1.20</td>
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Model fit: $-2 \log$ likelihood ratio test $X^2 (df=2) = 19.96$, $p<.001$

Figure 1: Treatment choices among patients with different delay time

![Graph showing treatment choices among patients with different delay time]
References


Illness perceptions in TB


Illness perceptions in TB


