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## Educational measure for promoting adherence to treatment for tuberculosis

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### Abstract

The aim of this work is to determine the effect of the educational intervention to improve the language barrier on adherence to antituberculosis treatment in the paediatric population. Immigrant population is associated with factors that make it difficult to monitor the treatment and control of tuberculosis infection or disease properly such as language difficulties.

68 patients were included in this study. They came from 15 different countries. The patients/families were given written information (a leaflet) in the form of questions and answers about the most common doubts that people have about antituberculosis treatment. This leaflet was translated into 11 different languages: Spanish, Catalan, English, French, German, Italian, Russian, Romanian, Chinese, Urdu and Arabic. Six patients/families that presented language barrier had successfully completed the treatment. In this study, language barrier was not associated with poorer adherence. We believe delivering information written in the mother tongue can improve understanding about the importance of the tuberculosis disease and its treatment.

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## 1. Introduction

There are large geographical differences in tuberculosis (TB) prevalence worldwide. Although 75% of all cases of TB are limited to a list of 22 developing countries (Adams & Starke 2013), the incidence in some developed countries has recently increased in relation to other countries of a similar socio-economic level, which has been associated with migration flows (Alcaide et al., 2000; Lew et al., 2008; Ríos & Monleón-Getino, 2009; Ailinger et al., 2007).

According to the World Health Organisation, it is estimated that there are approximately 9.4 million new cases of TB a year worldwide and half a million of these will be caused by multidrug-resistant strains. Drug resistances are a result of poor therapeutic compliance, due to either failure to take doses or failure to complete the course of treatment.

When the treatments are completed properly (with good adherence), they are very effective in preventing latent tuberculosis infection from progressing to TB disease and curing TB and preventing its transmission to other people.

Children are at higher risk for the development of TB disease than the rest of the population, especially those under the age of 5. In infants and toddlers, latent TB infection occurs more often and rapidly progresses to active TB and when this happens, more severe forms of TB disease are more frequent (Spanish Society of Paediatric Infectious Disease, 2006).

Migratory movements are currently considered the key point in understanding this recent increase in tuberculosis disease in Europe and the United States (Zenner et al., 2013; Klinkenberg et al. 2009; Altet et Alcaide, 2006; Sanz et al. 2009; Basterrechea et al., 2009). This immigrant population is associated with factors that make it difficult to monitor the treatment and control of TB infection or disease properly: living in small, overcrowded spaces with many other people, geographical mobility, no perception of the risk associated with TB, and language difficulties. The language barrier influences negatively the process of health education because communication worsens.

The aim of this work is to determine the effect of the educational intervention to improve the language barrier on adherence to anti-TB treatment in the paediatric population.

## 2. Methods

### 2.1. Study design and participants

We performed a prospective observational study on the influence of new educational intervention in the adherence to anti-TB medications in a cohort of paediatric patients (up to 18 years of age) followed-up from January 2015 to December 2015 at the Outpatient Clinic of Hospital “Sant Joan de Déu” (Barcelona), which serves as a referral centre for TB in “Región Sanitaria Barcelona Sur” (1,346,000 inhabitants, 16.5% of whom below 18 years of age).

New educational intervention was introduced in the patients' follow-up to improve their adherence to anti-TB treatment.

The educational measure consisted of giving written information in the mother tongue of the patient and their family.

The patients' father, mother or carer and the patients themselves, in the case of adolescents, were given written information (a leaflet) in the form of questions and answers about the most common doubts that people have about anti-TB treatment (what to do if you forget a dose, if you vomit, if you have bad stomach ache...). This leaflet was translated into 11 different languages: Spanish, Catalan, English, French, German, Italian, Russian, Romanian, Chinese, Urdu and Arabic. That leaflet was brightly coloured and had drawings. The family was asked what language wanted leaflet.

### 2.2. Data collection

Variables of interest were collected by Nurse-led Follow-up visits and included demographic data: age, sex, child's country of birth and family's country of origin, language barrier, and whether the index case had been identified or not and whether the index case was living with the patient; clinical data: indication for anti-TB treatment (primary chemoprophylaxis after TB contact, LTBI or active TB treatment), planned duration of treatment, daily number of tablets or doses of syrup, anti-TB drugs toxicity and type of toxicity. Adherence was defined as completion of the planned duration of anti-TB treatment as defined per family/patient report.

### 2.3. Data analysis

The data was recorded in a database created specifically in Microsoft XP Access and analysed using SPSS software, version 23.0. Qualitative variables were described in terms of proportions, calculating 95% confidence intervals. Quantitative variables were described using mean and median as measures of centrality and standard deviation and interquartile range as measures of dispersion. The normality of the distribution of quantitative variables was checked using the Kolmogorov-Smirnov test and appropriate parametric and nonparametric test were used for univariate analysis. A *p* value below 0.05 was considered statistically significant.

### 2.4. Ethical considerations

This study has been approved by the university Ethics Committee (July 2013) and the hospital Ethics Committee (September 2013).

Before inclusion in the study, written informed consent from parents or legal guardians was obtained, and written informed assent from young people aged 12 years or older, in agreement with Spanish regulations (Ley 42/2002 de Autonomía del Paciente).

## 3. Results

68 patients (41 females, 60.3%; mean/SD age: 8.8/6.1 years) diagnosed with tuberculosis disease or latent TB infection or risk contact were included in this study. Although 16 (23.5%) of them were not born in Spain, 32 (47.1%) children were from families of foreign origin. 8.8% (6) had language barrier which prevented communication between patient / family and nurse.

They came from 15 different countries. The countries were grouped into five distinct geographic areas: 52.9% (36) families came from Spain, 23.5% (16) from Latin America (mainly Peru, Bolivia and Ecuador), 11.8% (8) from North Africa (especially Morocco), 10.3% (7) from Asia (primarily China and Pakistan) and 1.5% (1) from Eastern Europe.

68 leaflets were given, of which: 40 were in Spanish language, 13 in Catalan, 8 in Arabic, 3 in Urdu, 2 in Chinese, 1 in English and 1 in Russian.

All six patients showed language barrier successfully completed treatment. Of these 6 patients: two requested the information written in Urdu, two in Chinese, one in Arabic and one in English.

The overall rate of completion therapy was 89.7% (61 patients). Non-adherence was associated with being born abroad (*p*=0.048) and family of foreign origin (*p*=0.001), but language barrier was not statistically significant as a factor of non-adherence.

## 4. Discussion

In our study, six patients that presented language barrier had successfully completed the treatment. The language barrier was not associated with poorer adherence. We believe delivering information written in the mother tongue can improve understanding about the importance of the tuberculosis disease and its treatment. The language barrier is an important factor to consider in health education. Solutions must be sought to reduce its impact and thus improve the quality of information provided to patients of immigrant origin with communication difficulties secondary language. A proper communication and correct health education are not possible when language barrier exists.

Several studies have shown the birth origin or country origin may influence patients' adherence like our study (Chang et al. 2014, Cruz 2012, Powell et al. 2008, Caylà et al. 2009, Ailinger et al. 2007). Only one didn't find significant differences in race/ ethnicity as a variable (Morisky et al. 2001). Maybe these results likely indicate that the family's country of origin is linked to cultural beliefs. Greater cultural understanding is needed to design more specific interventions to improve Health Education, and so, the adherence in this group. A good-grade of communication and a rich nurse/doctor-patient relationship improve the completion therapy (Salleras et al. 1993, Caylà et al. 2009, Parsyan et al. 2007). A good health education and communication are lower when language barrier exists. Our results are very significant.

It is necessary to promote best engaging among the immigrant population specially. Strategies as training nurses, doctors or the other health care providers in communications skills, improving knowledge with a better understanding without the language barrier becomes an obstacle (i.e. written information in the patient's mother tongue). Identifying these risk factors should to serve to design and implement more efficient educational interventions in patients receiving antituberculosis therapy.

Different educational and monitoring interventions have been applied separately to increase adherence to anti-TB treatment in several studies (Garfield et al. 2011, Ailinger et al. 2006), but there are few studies that include the simultaneous application of two or more interventions (Clark et al. 2007, Ailinger et al. 2010), and some of these are rather outdated (Salleras et al. 1993, Vidal et al. 1992).

The most common educational interventions include psychological therapy, manual or computerised telephone follow-up and written information as reinforcement. Educational and counselling interventions may increase the success rate for completion of treatment, but the extent of its benefit will depend on the nature of the intervention and each population's specific situation (M'Imunya et al. 2012).

In conclusion, leaflets written in the mother tongue would improve nurse / family-patient communication.

Our study has shown the language barrier is not associated with poorer adherence, but the birth origin and country origin may influence patients' adherence.

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