

## Diagnosis of tuberculosis: perspective of primary care nursing professional Diagnóstico de tuberculose: perspectiva do profissional de enfermagem da atenção primária

### Diagnóstico de tuberculosis: perspectiva del profesional de la enfermería en la atención primaria

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Received: 05/06/2016

Approved: 19/11/2016

Published: 01/05/2017

This study aims at analysing the difficulties in reaching a tuberculosis diagnostic in the perspective of the primary care nursing professional. It is a descriptive epidemiological study, conducted in 2009 with nursing professionals. The Primary Care Assessment Tool, adapted for tuberculosis, was the instrument used. General and access variables were analyzed: sex, profession, years working in the position, remuneration and workplace, knowledge about the disease, difficulties convincing the patient to collect sputum, or filling in the forms, work overload, access to information, updating, search for respiratory symptoms, home visits to deliver the recipient for sputum collection, health education. Data was stored in the software Statistica 8.0, from Statsoft, and a descriptive analysis was made. The following problems were observed: lack of knowledge, difficulty in filling out forms, and in convincing the patient to collect sputum. Active searches are performed, but not health education actions or home visits to deliver the sputum recipient. It is necessary to invest in continuing education for professionals in primary care, as it is a gateway to the entire health system.

**Descriptors:** Tuberculosis; Diagnosis; Health services; Primary health care.

Este estudo tem como objetivo analisar dificuldades no diagnóstico da tuberculose na perspectiva do profissional de enfermagem na atenção primária. Trata-se de um estudo epidemiológico descritivo realizado em 2009 com profissionais de enfermagem. O instrumento usado foi o Primary Care Assessment Tool adaptado para tuberculose. Foram analisadas variáveis gerais e de acesso: sexo, profissão, anos na função, remuneração e local de trabalho, conhecimento da doença, convencimento do doente a coletar escarro, preenchimento dos impressos, sobrecarga de trabalho, acesso às informações, atualização, busca de sintomáticos respiratórios, visita domiciliar para entrega do pote de escarro, educação em saúde. Os dados foram armazenados no Software Statistica 8.0 da Statsoft e foi feita uma análise descritiva. Observou-se falta de conhecimento, dificuldade em preencher impressos e convencer o paciente a coletar escarro. A busca ativa é realizada, em detrimento da educação em saúde ou visitas domiciliares para entrega do pote. É necessário investir em educação permanente para profissionais da atenção primária, porta de entrada do sistema de saúde.

**Descritores:** Tuberculose; Diagnóstico; Serviços de Saúde; Atenção primária à saúde.

Este estudio tiene como objetivo analizar las dificultades en el diagnóstico de la tuberculosis en la perspectiva del profesional de enfermería en la atención primaria. Se trata de un estudio epidemiológico descriptivo realizado en 2009 con profesionales de enfermería. El instrumento utilizado fue el Primary Care Assessment Tool adaptado para tuberculosis. Fueron analizadas variables generales y de acceso: sexo, profesión, años en la función; remuneración y lugar de trabajo; conocimiento de la enfermedad, convencimiento al paciente a recolectar esputo, llenado de formularios, sobrecarga de trabajo, acceso a las informaciones, actualización, búsqueda de síntomas respiratorios, visita a domicilio para la entrega del pote de esputo y educación para la salud. Los datos fueron almacenados en el Software Statistica 8.0 de Statsoft y se realizó un análisis descriptivo. Pudo observarse falta de conocimiento, dificultad en completar los formularios y convencer al paciente para recoger el esputo. La búsqueda activa es realizada en detrimento de la educación en salud o visitas domiciliarias para la entrega del pote. Es necesario invertir en educación permanente para los profesionales de la atención primaria, puerta de entrada al sistema de salud.

**Descriptor:** Tuberculosis; Diagnóstico; Servicios de salud; Atención primaria de salud.

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## INTRODUCTION

**T**uberculosis (TB) is an old disease, and it is still one of the greatest infirmities of humanity in the 21st century<sup>1-3</sup>. Although the incidence of the illness decreased in 15.4% (from 42.8 cases per 100 thousand people in 2001, to 36/100,000 in 2011) and the mortality rate, in 23.4% (from 3.1/100,000 in 2001 to 2.4/100,000 in 2011), Brazil is still one of the countries with the highest incidence of TB in the world. It is considered to be the second most deadly infectious disease, and the main cause of death of people who live with the human immunodeficiency virus (HIV) and the acquired immunodeficiency syndrome (AIDS)<sup>4,5</sup>.

According to the estimates of the World Health Organization (WHO), there were 8.8 million new cases of TB in 2010. 1.4 million deaths were caused by the disease and 5.7 million new cases and relapses were notified. Between 2008 and 2010, a reduction in the number of new cases (from 73,673 to 70,601) was reported. That number should remain reduced and declining<sup>6</sup>.

The new report of objectives and development for the millennium has indicated Brazil as one of the seven countries, among the 22 with the highest number of TB cases, to achieve the objectives proposed for the reduction of its incidence. The number of cases fell from 51.8 to 37 cases for every 100 thousand people, from 1990 to 2012 - consequently diminishing the numbers of deaths caused by TB<sup>7</sup>.

Mortality by TB has been decreasing, but it is still an unacceptable number for a disease that can be avoided and has a cure prognosis<sup>8</sup>. The disease has been diagnosed late, in an advanced state, and by hospitals, many times resulting in the death of the patient. According to the national health policy, diagnosing and treating the disease are responsibilities of Primary Care, and are not restricted to medical knowledge.

Since 2003, the WHO has been showing concern regarding the qualification of its health teams to take responsibility for the control of TB, and regarding the integration of the control of the disease to Primary

Health Care services. This is one of the difficulties in reaching the objectives of detection and cure<sup>9</sup>.

Municipalities are responsible for the development of programs to control TB, based on the norms and orientations of the current National Plan for the Control of Tuberculosis (NPCT). To do so, the need to adapt to local diversity is highlighted, especially considering Supervised Treatment (ST)<sup>10</sup>.

Health professionals (HP), as well, are paramount in the active search of patients. The bond between professional and user favors the continuity of care, especially when the social, economic and cultural role of the user and their family is known, which favors therapeutic relationships<sup>11,12</sup>.

Several studies point to a lack of qualified human resources (HR), interest and motivation of the health team, not to mention a small number and a high turnover at the Health Centers (HC), which generates excessive work to the health services (HS); these are the difficulties found in the control of the disease<sup>13,14</sup>. It is necessary to be familiar with the difficulties of the HS to apply permanent educational actions, and thus provide the health professionals with the information and skills needed for the diagnosis, management and control of TB in the scope of Primary Health Care<sup>16</sup>.

Therefore, the objective of this study is to analyze the difficulties in diagnosing tuberculosis in the perspective of the nursing professionals of primary health care (PHC) in the city of São José do Rio Preto/SP/Brazil.

## METHOD

This is a descriptive epidemiological study of the questionnaire type, conducted with nursing professionals of São José do Rio Preto, a city with 419,632 people.

The health system of the city consists in 13 Primary Health Units (PHU), 04 outpatient clinics, 11 Primary Units for Family Health (PUFH), 01 ambulatory clinic that is a reference for TB treatment, and 01 service specializing in receiving STD/AIDS patients (SAE), in addition to 03 hospitals that attend through SUS and 03 private ones.

Up to 2007, the actions to control TB were centralized, and conducted by the specialized team of the Municipal Program for the Control of Tuberculosis (PCT), after what a gradual process of decentralization was started for the PHC units, and currently, the diagnosis and treatment of TB patients in the city are a responsibility of the generalist teams that act at the PHC, counting with the help of the specialized PCT team. This team aides and provides technical support to the units. It is also responsible for managing the program and supplying information to the data systems that overview the disease, in addition to offering clinical care for more complex cases. Most TB patients who are also infected with HIV/AIDS are also accompanied by the specialized infectious and contagious diseases care (SAE).

This study is part of a multicentric project called "Delay in tuberculosis diagnostic: analysis of its causes in different regions of Brazil" - Edital MCT/CNPq/CT-Saúde/MS/SCTIE/DECIT nº 034/2008. One of the objectives of the project was to analyze the performance of primary health care and emergency services (ES) in the diagnosis of tuberculosis.

In this project, 160 health professionals from the primary care network of the city were interviewed, 54 professionals from each type of health service (PHU, PUFH and ES). The professionals then interviewed were divided proportionally, according to the number of people from that category in each unit. Thus, were interviewed: 25 physicians, 7 nurses and 22 assistant/technicians in each type of service. The selection of health units and interviewees was random.

In this study, only nursing professionals (nurses, nursing assistants and technicians) who acted in the PHC units (PHU and PUFH) were selected. Therefore, the population of this study was composed of 58 nursing professionals, 14 of them nurses and 44 nursing assistants and technicians.

To the interviews, a structured data collection instrument was used, whose elaboration was based on the Primary Care Assessment Tool (PCAT), validated for the evaluation of Brazilian primary health care

services<sup>16</sup> and adapted to evaluate the care for TB patients<sup>17</sup>.

The instrument is constituted by variables divided into sections and dimensions. In this study, the variables from the section general information (gender, professional category, for how long is the person working in the same position, opinion about the payment and the workplace) and from the dimension "access to the diagnosis" (difficulties due to lack of knowledge about the disease, difficulties to convince the patient to collect sputum, difficulties to fill the prints, excessive workload, frequency with which the professional has access to information about TB, the ways in which the professional stays updated, search for respiratory symptoms, domestic visits to deliver sputum recipients, health education developed in partner institutions, educational activities about TB in the health service, frequency of training about TB, and security to diagnose the user suspected of having TB) were used.

The interviewees answered each question in the questionnaire with dichotomic answers (Yes or No), open answers, or following pre-established scale of possibilities - a Likert scale, to whose answers a value from 1 to 5 was attributed, to register the level of preference (or concordance) of the statements.

Data was stored in a data bank of the software Statistica 8.0, by Statsoft. After that, techniques of descriptive analysis were applied to the data (simple and absolute frequencies), and charts and tables were created to present the results.

The research project was submitted to the Research Ethics Committee of the Medicine College of São José do Rio Preto, according to the guidelines from resolution 196/96 CNS, and was approved according to the norms, under protocol 3747/2011.

## RESULTS

From the 58 health professionals interviewed in the PHU and PUFH, 24.14% were nurses and 75.86% were nursing assistants and technicians. Inside table 1 are the general characteristics of the nursing professionals,

according to the type of service in which they work. The female gender is predominant (96.55%) both un PHUs and PUFHs. Only 3.45% of professionals are male.

Regarding the amount of time, 58.62% of PUFH professionals work in their positions for 0 to 5 years, while in the PHU this number is between 5 and 10 years.

Considering their remuneration, 62.07% of professionals at the PUFH state that it is "good", while at the PHU, 58.62% state that it is "regular". 62.07% of people who work at the PUFH and 51.72% of people who work at the PHU say that their workplace is "good".

**Table 1.** Distribution of nursing professionals according to gender, time in the same position, and opinions regarding their payment and workplace, according to the type of health service in which they work, São José do Rio Preto, Brazil, 2009.

General specifications		PUFH N (%)	PHU N (%)
Gender	Female	28 (96.55)	28 (96.55)
	Male	1 (3.45)	1 (3.45)
Time working in the same position	0 to 5 years	17 (58.62)	9 (31.03)
	5 to 10 years	8 (27.59)	12 (41.38)
	10 to 15 years	3 (10.34)	4 (13.79)
	15 to 20 years	1 (3.45)	4 (13.79)
Payment	Good	18 (62.07)	8 (27.59)
	Bad	1 (3.45)	2 (6.90)
	Regular	8 (27.59)	17 (58.62)
	Very bad	2 (6.90)	1 (3.45)
	Very Good	0 (0)	1 (3.45)
How is it to work in that place?	Good	18 (62.07)	15 (51.72)
	Regular	6 (20.69)	9 (31.03)
	Very good	4 (13.79)	4 (13.79)
	Bad	1 (3.45)	0 (0)
	Very bad	0 (0)	1 (3.45)

Table 2 presents the distribution, by professional category, of the answers regarding their difficulties with TB in the health services.

It can be noted that most nurses (85.71%) state to "sometimes" / "almost always" lack knowledge regarding TB, while 61.36% of assistants /technicians say the same.

Regarding difficulties in convincing the patient to collect sputum, the nurses (57.14%) state to "always" / "almost always" have this difficulty, as well as 65.91% of

assistants/technicians. 57.14% of nurses and 84.09% of assistants/technicians "always" have difficulties filling forms (exam requests).

Nurses and nursing assistants/technicians have different opinions when it comes to work overload, since 57.15% nurses stated that they "never" / "almost never" are overloaded, while 72.73% of assistants assistantsand technicians state that they "always" / "almost always" have excessive workloads at the HS.

**Table 1.** Distribution of opinions regarding the difficulties with TB in the health services in which professionals work, according to category. São José do Rio Preto, Brazil, 2009.

Difficulties		Nurse	Assistant/Technician
		N (%)	N (%)
Health professionals' lack of knowledge regarding the disease by the	Always	1 (7.14)	13 (29.55)
	Almost always	4 (28.57)	15 (34.09)
	Sometimes	8 (57.14)	12 (27.27)
	Almost never	1 (7.14)	2 (4.55)
	Never	0 (0)	2 (4.55)
Convincing the patient to collect sputum	Always	5 (35.71)	22 (50.00)
	Almost always	3 (21.43)	7 (15.91)
	Sometimes	5 (35.71)	11 (25.00)
	Almost never	1 (7.14)	0 (0)
	Never	0 (0)	4 (9.09)
Difficulty to fill in the forms (exam requests)	Always	8 (57.14)	37 (84.09)
	Almost always	1 (7.14)	4 (9.09)
	Sometimes	2 (14.29)	3 (6.82)
	Almost never	2 (14.29)	0 (0)
	Never	1 (7.14)	0 (0)
Work overload	Always	3 (21.43)	15 (34.09)
	Almost always	1 (7.14)	1 (2.27)
	Sometimes	2 (14.29)	17 (38.64)
	Almost never	2 (14.29)	4 (9.09)
	Never	6 (42.86)	7 (15.91)

According to table 3, it can be noted that 78.57% of nurses "always" / "almost always" have access to information regarding TB and 71.43% of them use, as a source of information, "Internet" / "books". When asked about how they keep their knowledge up to date, 78.57% of nurses said they perform general readings.

Nursing assistants/technicians (45.45%) stated that "sometimes" they have access to information on the disease, and 52.27% of them use as a source of information "Internet"/"books", and say they keep their knowledge updated through general readings.

Table 4 indicates that 75.86% of nursing professionals from the PUFH and 51.73% of those at the PHU "sometimes" / "always" perform searches for cases suspect of TB. In domestic visits (DV), 62.07% of PUFH professionals "never"/"almost never" deliver the recipient for sputum collection, while 75.86% of PHU professionals "never" do. Regarding health education actions carried out in churches, neighborhood associations and other places to deliver the sputum recipient, 62.07% of PUFH professionals and 68.97% of PHU professionals state to "never" do this activity.

75.86% of the PUFH nursing team, as well as 58.61% of the PHU nursing team state

that "sometimes" / "always" / "almost always" offer guidance regarding TB to the community. 65.52% of workers of the PUFH "sometimes" and "always" conduct educational actions regarding TB, while 51.72% of professionals of the PHU "sometimes" do the same.

According to table 5, all nurses who work at the PUFH or in the PHU feel safe to

identify a patient with a suspicious case of TB, as opposed to the nursing assistants/technicians, among which only 72.73% said to be safely capable of doing so. Regarding training on TB, 35.71% of nurses and 31.82% of assistants/technicians have participated in at least one that was conducted last year.

**Table 3.** Distribution of opinions regarding the access to information about TB and knowledge updating, according to professional category. São José do Rio Preto, SP, Brazil.

Information about TB		Nurse N (%)	Assistant/Technician N (%)
How often do you have access to information about TB?	Sometimes	1 (7.14)	20 (45.45)
	Almost always	4 (28.57)	7 (15.91)
	Always	7 (50.00)	12 (27.27)
	Never	0 (0)	2 (4.55)
	Almost never	2 (14.29)	3 (6.82)
Specify	Continued education	1 (7.14)	7 (15.91)
	Magazines	0 (0)	1 (2.27)
	News	0 (0)	1 (2.27)
	Internet/books	10 (71.43)	23 (52.27)
	Leaflets/manuals	3 (21.43)	12 (27.27)
How do you keep up to date?	Continued education	1 (7.14)	4 (9.09)
	I do not due to lack of time	0 (0)	1 (2.27)
	Courses	2 (14.29)	6 (13.64)
	TV	0 (0)	1 (2.27)
	With the nurse	0 (0)	8 (18.18)
	College	0 (0)	1 (2.27)
	General readings	11 (78.57)	23 (52.27)

**Table 4.** Distribution of TB actions conducted by a health service, according to the nursing professionals who work in the PUFH and PHU. São José do Rio Preto, SP, Brazil.

Actions conducted		PUFH N (%)	PHU N (%)
Domestic visits in the area under the scope of the service to deliver the recipient to collect sputum	Sometimes	7 (24.14)	2 (6.90)
	Always	3 (10.34)	2 (6.90)
	Almost always	0 (0)	0 (0)
	Does not know	1 (3.45)	1 (3.45)
	Never	12 (41.38)	22 (75.86)
Health education actions in churches, neighborhood associations and others, to deliver the recipient for sputum collection	Almost never	6 (20.69)	2 (6.90)
	Sometimes	4 (13.79)	5 (17.24)
	Always	2 (6.90)	2 (6.90)
	Almost always	0 (0)	0 (0)
	Does not know	1 (3.45)	2 (6.90)
Guidances regarding TB to the community	Never	18 (62.07)	20 (68.97)
	Almost never	4 (13.79)	0 (0)
	Sometimes	11 (37.93)	10 (34.48)
	Always	8 (27.59)	3 (10.34)
	Almost always	3 (10.34)	4 (13.79)
Educational actions about TB in the health service where they work throughout the year	Does not know	2 (6.90)	3 (10.34)
	Never	3 (10.34)	7 (24.14)
	Almost never	2 (6.90)	2 (6.90)
	Sometimes	12 (41.38)	15 (51.72)
	Always	7 (24.14)	2 (6.90)
Educational actions about TB in the health service where they work throughout the year	Almost always	2 (6.90)	6 (20.69)
	Does not know	1 (3.45)	0 (0)
	Never	4 (13.79)	2 (6.90)
	Almost never	3 (10.34)	4 (13.79)

**Table 5.** Distribution of the answers of nursing professionals regarding their ability to find cases suspicious of TB, and whether or not they have been trained for that in the last years. São José do Rio Preto, SP, Brazil.

Information about TB		Nurses N (%)	Technicians/assistants N (%)
"Do you feel safe to identify users that should be suspected for TB?"	Yes	(100)	32 (72.73)
	No	0 (0)	12 (27.27)
Training about TB conducted in the last few years	1 to 2 years	2 (14.29)	8 (18.18)
	3 to 4 years	2 (14.29)	9 (20.45)
	5 years or more	1 (7.14)	3 (6.82)
	In the last year	5 (35.71)	14 (31.82)
	No training	4 (28.57)	10 (22.73)

## DISCUSSION

It was noted that more than half of the nursing professionals are female, work in the same position for more than five years, and are satisfied with their workplace and remuneration.

When analyzing the characteristics of the professionals that participated in the research, females were predominant,

confirming the national tendency of feminization of the health care work force<sup>18</sup>.

In primary care there is no restriction, that is, the entire population is attended at the service, and people with all types of health conditions are cared for, since one of the responsibilities of these services is to organize and rationalize the use of the other resources<sup>19</sup>. This can lead to discomfort for

the professionals, due to the accumulation of functions in the same professional, as they need to perform several activities without the adequate professional profile and training<sup>9</sup>.

Nurses understand that keeping themselves up to date is very important and that demands are high nowadays, due to the creation and changes in technology, that generate new ways to look at the work of the health team. The nursing professional must take into account their own work needs and expectations, and look for theoretical support that can shed light on their potentialities and difficulties. By doing that, they can adapt to them on their day to day job, as they care for the ill<sup>20</sup>.

The length of time that nursing professionals work in primary health care is varied. Those who work at the PHU stay longer in their positions than those in the PUFH. Such a distribution can be attributed to the decentralization of health services that happen from 1998 on, in São José do Rio Preto, when the municipality itself took control of the Management of the Health System, and with it, of workers who used to be part of other federal entities. At this time, an increase in the number of hires also started<sup>21</sup>.

Payment is generally mentioned as the element of a nurses work that generates the greatest dissatisfaction. That greatly influences the amount of time the professionals stay in the same position, though more than half of them are satisfied with their payment and the place in which they work<sup>22,23</sup>. One of the consequences of this is an increase in the motivation and performance of their work, coupled to their willingness to improve and learn more.

The Ministry of Health (MH) recommends for all professional categories of primary health care to be contemplated with permanent education in health as to better care for the TB patient. Other studies show that professionals are concerned regarding their training for the care of TB. That indicates how important it is, and how it must guarantee the comprehension of the disease and its constraints, as well as the

instruments and technologies that can be used for its prevention and control<sup>24</sup>.

The strategy recommended by the MH is for user care to be qualified, as every professional who work at primary care, from physicians to communitarian health agents and the nursing team, is frequently in touch with the patient. Thus, the professionals can seem more trustworthy to the patients and their families, while identifying cases suspect of TB infection, in order to conduct active searches for respiratory symptoms (ASRS), ST and the filling of the necessary forms.

Although it is a simple procedure, the use of ASRS in the control of TB requires skill, as the contact starts through the health care unit, and the bond becomes bigger and bigger. The professional must be willing to give to the patient all relevant information regarding their disease, including its signals and symptoms, guidance's on sputum collection, lab exam flow, and even referrals for other health services, if necessary. Thus, the necessity to invest in the qualification of human resources is urgent and must be continuous, so that better working conditions can be found, leading to a more effective service<sup>25</sup>.

Considering the actions carried out by the health services in which they work, both PUFH and PHU give diverging answers. They state to always conduct ASRS for TB in their units, although the results show that they never or almost never conduct DV and/or health education in churches and/or neighborhood associations to deliver the recipient for sputum collection.

The performance of the services in the assistance of TB patients does not, still, target as much as it should the community and the real health necessities of the population. That indicates the need to rethink the practice, to develop a line of action that overcome the "walls" of the health services. The conduction of domestic visits is necessary in the social context of the ill and of their family, as it establishes a bond between them. The health professional is directly tied to the sick, especially the nursing team, with whom they have a longer contact. This bond allows for the nurse to get to know better the



environment in which these patients are inserted, their needs and idiosyncrasies, allowing for the supervision of the treatment of the ill and their families<sup>2</sup>.

Regarding the access of information regarding TB, what they use as information sources and how they keep updated, both categories answered unanimously that they have this information through Internet/books, and get updated information through general reading. This difficulty might be related to the lack of training of the professionals.

Studies conducted in Brazil have shown that, beyond lack of knowledge of the PHU in the management of TB, there was also a lack of training and planning throughout the service<sup>13</sup>.

In São José do Rio Preto, the HC were found not to be fully qualified according to the PCT guidelines. It was also difficult to move them from their workforce to receive training, due to other local priorities. The difficulty of user access and consequent lateness in acquiring an effective TB diagnosis is not something exclusive to this city; it is present in many regions of the world<sup>28</sup>.

The flaws in the HC training process, coupled with a high staff turnover, lead to no effective actions to update and improve knowledge, consequently impairing the ability to achieve a TB diagnosis.

Therefore, the primary health care HCs must have permanent strategies to qualify and train their professionals. This necessity might be connected to the lateness in accessing the disease diagnostic, which also affects other types of pathologies. With fragmented health systems, acute conditions are given preference, and those that are in a chronic stage are not taken into account<sup>29</sup>.

According to a study conducted in Fortaleza<sup>30</sup>, the FHS team training and sensitization managed to improve the detection of TB cases. That is, the updating and conservation of a trained team motivate the professionals, leading to early diagnosis and treatment, and contributing to the control of the disease.

## CONCLUSION

Considering the proposed objectives, the main difficulties pointed out by the nursing professionals were the lack of knowledge about TB, problems to convince the patient to collect the sputum and to fill the exam request forms, in addition to work overload (especially among technicians), and difficulties in the active search of respiratory symptoms, especially outside of the PHU and in domestic visits. Another difficulty highlighted was regarding health education and permanent education/training.

These results indicate the necessity to invest more in strategies of permanent and systematized qualification and training of nursing professionals. Professionals of other categories, who are part of the different services considered to be gateways to the primary health network, would also benefit from such strategies.

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## CONTRIBUTIONS

**All authors** contributed equally in the design of the study, its analysis, and in the final writing and critical reading of the article.

### How to cite this article (Vancouver)

Salzani MGB, Oliveira SAC, Rocha MAZP, Jesus GJ, Gazetta CE, Vendramini SHF, Santos MLSG, Oliveira T. Diagnosis of tuberculosis: perspective of primary care nursing professional. *REFACS* [Internet]. 2017 [cited in *day, month and year of access*]; 5(2):180-190. Available in: *access link*. DOI: .

### How to cite this article (ABNT)

SALZANI, M. G. B. et al. Diagnosis of tuberculosis: perspective of primary care nursing professional. *REFACS*, Uberaba, MG, v. 5, n. 2, p. 180-190, 2017. Available in: *<access link>*. Access in: *insert day, month and year*. DOI: .

### How to cite this article (APA)

Salzani, M. G. B., Oliveira, S. A. C., Rocha, M. A. Z. P., Jesus, G. J., Gazetta, C. E., Vendramini, S. H. F., Santos, M. L. S. G. & Oliveira, T. (2017). Diagnosis of tuberculosis: perspective of primary care nursing professional. *REFACS*, 5(2), 180-190. Recovered in: *insert day, month and year*. *Insert access link*. DOI: .