PERMANENT EDUCATION IN HEALTH: A STRATEGY TO CARE FOR PEOPLE DEPRIVED OF LIBERTY AFFECTED BY TUBERCULOSIS

EDUCAÇÃO PERMANENTE EM SAÚDE: ESTRATÉGIA PARA ATENÇÃO ÀS PESSOAS PRIVADAS DE LIBERDADE ACOMETIDAS PELA TUBERCULOSE

EDUCACIÓN PERMANENTE EN SALUD: ESTRATEGIA DE ATENCIÓN A PERSONAS PRIVADAS DE LIBERTAD AFECTADAS POR TUBERCULOSIS

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ABSTRACT: Tuberculosis is the infectious disease that most causes death, especially among Persons Deprived of Liberty (PPL), so the Penitentiary Agent (PA) can play a central role in the diagnosis and treatment. Objective: to analyze the knowledge and attitudes of the AP in relation to tuberculosis, aiming to subsidize discussions on Permanent Education (PE). Methodology: Epidemiological, descriptive and exploratory study, carried out in prison institutions in Foz do Iguaçu - Paraná. The primary data were collected through a KAP model questionnaire (Knowledge, Attitude and Practice. An exploratory analysis was used through the distribution of absolute and relative frequencies. Results: There is a relationship between knowledge and attitude with age, education, length of profession, participation in courses and care for PDLs sick with tuberculosis. Conclusion: It was verified the need for investments to improve knowledge, suggesting PE as a tool to improve the participation of Agents in the Health care of PDLs.

KEYWORDS: Prison. Tuberculosis. Permanent education in health.

RESUMO: *A tuberculose é a doença infecciosa que mais ocasiona óbito, principalmente entre as Pessoas Privadas de Liberdade (PPL), assim, o Agente Penitenciário (AP) pode ter um papel central no diagnóstico/tratamento. Objetivo: analisar o conhecimento e as atitudes dos AP frente à tuberculose, visando subsidiar discussões sobre a Educação Permanente (EP). Metodologia: Trata-se de um estudo epidemiológico, descritivo e exploratório, realizado em instituições prisionais situadas em Foz do Iguaçu - Paraná. Os dados primários foram coletados por meio de questionário modelo KAP (Knowledge, Attitude and Practice). Utilizou-se análise exploratória por meio da distribuição de frequências absoluta e relativas. Resultados: Há relação entre o conhecimento e atitude com a idade, escolaridade, tempo de profissão, participação em cursos e assistência às PPL adoecidas por tuberculose. Conclusão: Verificou-se a necessidade de investimentos para melhoria dos conhecimentos, sugerindo a EP como ferramenta para aprimorar a participação dos Agentes no cuidado em Saúde das PPL.*

PALAVRAS-CHAVE: *Prisão. Tuberculose. Educação permanente em saúde.*

RESUMEN: *La tuberculosis es la enfermedad infecciosa que más causa la muerte, especialmente entre las Personas Privadas de Libertad (PPL), por lo que el Agente Penitenciario (AP) puede jugar un papel central en el diagnóstico y tratamiento. Objetivo: analizar los conocimientos y actitudes de la AP con relación a la tuberculosis, con el objetivo de subsidiar discusiones sobre Educación Permanente (EP). Metodología: Estudio epidemiológico, descriptivo y exploratorio, realizado en instituciones penitenciarias en Foz do Iguaçu - Paraná. Los datos primarios fueron recolectados a través de un cuestionario modelo KAP (Knowledge, Attitude and Practice - Conocimiento, Actitud y Práctica). Se utilizó un análisis exploratorio a través de la distribución de frecuencias absolutas y relativas. Resultados: Existe relación entre el conocimiento y la actitud con la edad, la educación, la antigüedad en la profesión., participación en cursos y atención a pacientes del PPL con tuberculosis. Conclusión: Se verificó la necesidad de inversiones para mejorar el conocimiento, sugiriendo la EP como herramienta para mejorar la participación de los Agentes en la Atención a la Salud del PPL.*

PALABRAS CLAVE: *Prisiones. Tuberculosis. Educación Permante en salud.*

Introduction

Tuberculosis is the infectious disease that causes most death, especially among People Deprived of Liberty (PDL), so the Penitentiary Agent (PA) can play a central role in diagnosis and treatment. Objective: To analyze the knowledge and attitudes of the PA regarding tuberculosis, with a view to subsidizing discussions on Permanent Education (PE). Methodology: Epidemiological, descriptive and exploratory study, carried out in prison institutions in Foz do Iguaçu - Paraná. Primary data were collected through a KAP model questionnaire (Knowledge, Attitude and Practice). An exploratory analysis was used through the distribution of absolute and relative frequencies. Results: There is a relationship between knowledge and attitude with age, education, duration of profession, participation in courses and care for TB patient PDLs. Conclusion: The need for investments to improve knowledge was verified, suggesting PE as a tool to improve the Agents' participation in the care of PDLs (CARVALHO *et al.*, 2018).

In Brazil, according to data surveyed in the 2021 epidemiological bulletin, 66,819 new cases were registered in 2020, and 4.5 thousand deaths from TB in 2019, a mortality coefficient of 2.2 deaths per 100 thousand inhabitants (BRAZIL, 2017). Because it is considered a disease of intrinsically social etiology, indigenous people, people infected with HIV-Aids, the homeless population and People Deprived of Liberty (PDL) constitute high-risk groups related to TB (MACEDO; MACIEL; STRUCHINER, 2017).

In the period from 2010 to 2019, an increase in the proportion of new TB cases diagnosed among PDL was observed, with 8,154 (11.1%) new cases reported in 2019 (BRAZIL, 2017). Among PDLs, the risk of getting sick with TB is up to 28 times higher than in the population considered free. Poor hygiene conditions, poorly ventilated cells, overcrowding, and poor nutrition are some conditions that increase the risk for TB, and may also be related to individual characteristics and socioeconomic conditions existing prior to incarceration, highlighting the indicators for males, such as low education, poor general health conditions, and drug use (RICALDONI; SENA, 2006; VALENÇA *et al.*, 2016; BERLT *et al.*, 2021).

Through this initial analysis of the health situation of PDL, the Prison Agent (PA) must play a strategic role in the early diagnosis of TB, given their condition of regular contact with PDL, being able to observe the signs and symptoms of illness and changes in the detainees'

behavior, setting these as triggering elements for the beginning of the cycle of care by the prison health team (DIUANA *et al.*, 2008).

Considering the severity and magnitude of the disease in the prison system, the role of the PA emerges as intrinsically responsible for developing prevention actions and aiding in early diagnosis, as well as the organization and management of spaces for the promotion of scientific studies that allow making indispensable the implementation of measures aimed at controlling TB within the prison system (FELIPE *et al.*, 2021).

This contextualization allows us to observe that an operative interface between the actors inserted in the object of this study is necessary; this obviously has as its final role a precise change in behavior, the very concept of what is expected with learning. Still on this conceptual point, it can be inferred that there are processes that become more efficient to operate in this field, and the PA can be treated as this trigger for the expected behavioral changes. Thus, problematizing practices such as Permanent Health Education (PHE) have an amplifying force in real learning, increasing the production of answers, emphasizing that for this the environments should be rich in exchanges and experiences, generating a lot of new questions about being and acting in the world. (GOMES; BARBOSA; FERLA, 2016).

Education, in this study, is understood as a permanent and diffuse process throughout social life. Therefore, it has a central role to play, as, for example, in the consolidation of social rights, through social protection policies, and here we are talking about the PDL. The interlocution of education with work is not a mere instrument at the service of prevailing economic interests or access to productive processes and maintenance, as this has the exclusionary logic that serves neoliberal interests, but, on the contrary, education in and for work aims at human emancipation, stimulates decision-making power (FERNANDES, 2019).

Here the focus is on the subject of AP as an interface with the PDL, which in fact is an obstacle to be transposed, because the imposed relationship is not of mutual learning, but itself, almost something verticalized and unidirectional, produced by the inherent condition of the prison structure, something that leads to a conflict with the concept of PHE and must be critically observed so that the process of education of PA is not conducted in a biased way.

It is worth noting the difficulty of implementing PHE processes at any level of cooperative action, because the practices that evaluate programs and projects are excessively standardized, which leads to a loss for its consolidation, given the excess of parameterizations that must be taken into account for the effectiveness of the PHE own movements (PINHEIRO; SILVA-JUNIOR, 2018).

It is still important to mark and separate concepts, because PHE is confused with other models, including Continuing Education. The latter is a set of experiences that the worker acquires during his training, and makes it possible to increase or improve his competence for the strict exercise of his end activity and compatible with the development of his responsibilities, a technical and punctual training, which does not require from the worker a commitment to his field of action and team, unlike PHE (BRAZIL, 2022).

This study aimed to analyze the knowledge and attitudes of PAs, seeking to observe their behavior and their conduct in the face of what is circumscribed to the presence of TB, in order to organize and support the discussion of how the PHE process can become an assertive tool for the real needs of PDLs, with the purpose of welcoming and caring for the patient, on an increased spectrum of concrete actions, affirmative and resoluteness.

The project was forwarded to the Ethics and Research Committee with Human Beings and approved by CAEE no.: 68998617.0.0000.0107, following all the procedures determined by Resolution 510/2016 (CNS, 2016).

Methods

This is an epidemiological, descriptive, and exploratory study, conducted from primary data collected in 2017.

The study population was chosen as PAs who worked in all prisons located in Foz do Iguaçu - Paraná. To perform the sample calculation, the GPower 3.1.37 program was used, assuming the evaluation with one factor (Penitentiaries), containing 3 levels (Laudemir Neves Public Prison, Foz do Iguaçu State Penitentiary I and Foz do Iguaçu State Penitentiary II). For the calculation we used the "F" distribution with a large effect size equal to 0.4, type I error (α) equal to 0.05, and analysis power of 0.95. Based on these parameters, and knowing that in total there were 260 AP distributed among the three prisons, we established a minimum sample size of 103 AP.

The data collection instrument used was adapted from the KAP surveys (Knowledge, Attitude and Practice) model, which has been used to collect data on knowledge, attitudes and practices about diseases or illnesses. The instrument was composed of 58 open and closed questions, with dichotomous and multiple-choice response options, divided into four (04) sections: sociodemographic information, professional information, knowledge about TB, and attitudes about TB.

Data collection occurred daily throughout the month of August, 2017. The PAs were approached during their work shifts, at times established by the directors of the penitentiaries.

After collection, the data were entered using the double-entry technique in a Microsoft Excel spreadsheet. The Kappa coefficient of agreement was calculated to verify the degree of agreement between the two entries, and the result was 0.904, i.e., less than 1.0. After this step, the spreadsheet of collected data was transported to the Statistical software StatSoft 12.0, in which the analyses were performed.

The data were initially analyzed using descriptive statistical techniques. To perform the analysis of the PAs' level of knowledge, the participants' answers to the questions about knowledge about TB contained in the data collection instrument were corrected based on the Manual of Recommendations for Tuberculosis Control in Brazil (BRAZIL, 2019), being categorized as "correct" and "incorrect".

Results

Among the 106 PA who participated in the study, 91.5% were male, with a mean age of 33.3 years, and 80.1% had completed college education.

Among the PAs between 18 and 35 years old, 74% showed to have knowledge about the theme. As for education, the highest percentage with knowledge was among those with incomplete higher education (87.5%) (Appendix 1).

PAs with longer working time were among the group with the greatest knowledge about TB, totaling 64%; those who completed some training course throughout their career also showed knowledge (68%) (Appendix 1).

For the variable TB severity in the country and region, only 53.7% answered correctly; about the microorganism causing the disease, 66.1% of them chose the incorrect option (Appendix 2).

For the TB signs and symptoms variables, cough lasting more than three weeks was answered correctly by 77.4% of the PAs; on the other hand, for fever without a clear cause lasting more than seven days, there was a high percentage of incorrect answers (91.5%) (Appendix 2).

Regarding the forms of transmission of the disease, many incorrectly believe that insect bites (23.6%), sexual contact (51.9%), contact with saliva (94.3%), and touching public items such as doorknobs and carrying handles (56.6%) are forms of transmitting the disease. As for

TB prevention, it is noteworthy that 52.0% of the interviewees incorrectly consider that the use of condoms and 32.1% that the use of repellents can prevent the disease. For 81.1% and 88.7%, respectively, sputum smear microscopy and sputum culture were correctly signaled as diagnostic tests. However, only 55.7% of them chose the option active search for respiratory symptomatic inmates as a priority action (Appendix 2).

Regarding their attitudes about themselves in relation to TB, 99% stated that they could contract the disease. Regarding their reaction if they knew they were sick with TB, 32.7% said they would feel fear, 23.1% surprise. For 83.6%, if they had TB, they would tell their doctor or other health professional and their spouse, respectively (Appendix 3).

Regarding free diagnosis and treatment, 89.4% knew that it is free, but 5.7% believed that it is very expensive. Also, 43.3% of the PAs reported that they would have no special feeling toward people sick with TB (Appendix 4).

Most (93.3%) knew that HIV-AIDS people should be concerned about TB. Only 30.0% of the professionals consider themselves well-informed about TB and 80.0% would like more information about the disease. Regarding the most effective communication device for disseminating TB, 62.5% said television (Appendix 4).

Appendix 5 shows the results on the knowledge and attitude of the interviewees, according to previous contact with the subject of TB in a training course to become a PA. With the exception of the variables weight loss as a symptom of TB ($p=0.028$), insect bites as a form of transmission of the disease ($p=0.036$) and the use of repellent as a form of avoiding TB ($p=0.020$), there was no statistically significant difference between the correct and incorrect answers between the group that was trained in TB and the group that was not trained before taking on the job as a PA.

Discussion

The concreteness of the data highlights some key elements about the primary need for insertion of PHE in the structuring base of public services that are responsible for the life of the individual under their tutelage, especially with regard to issues that affect the health of those deprived of their freedom. This observation is necessary and leads to a critical reflection on how the State understands its role and how to modify it positively, in order to improve the use of available tools for health promotion via PHE.

However, and despite the concern of those who wish to build work processes really synergistic with PHE, it is understood that it is possible the distortion of these same processes, which can mischaracterize them with segmented and oppositional actions that lose their meaning when performed by sectors not affected to the reflective process, subtracting the intention of its main characteristic, which should subsidize the professional with tools that allow him to develop technically and enable him to have conditions to face neglected diseases in favor of the collective in which he is inserted, as already observed by Mancia, Cabral, and Koerich (2004).

Therefore, there is an emphatic need for the managers of these spaces to promote PHE for the development of skills and capabilities of the professionals involved in the work in question, especially in improving the processes aimed at expanding the understanding of the object in question, because only good technique does not enable the individual for health actions, the dynamics of constant renovations of the work spaces is the first challenge (MENDES, 2011).

The results obtained in this research allow us to observe and infer that the knowledge about TB among PAs is related to defined and objective variables, among the main ones: age, education, time in the profession, participation in training and/or capacity-building courses and direct assistance to a PDL with TB, the latter having a strong appeal to the understanding of the disease and its management.

Those surveyed aged between 18 and 35 years showed higher frequency in the knowledge category (74%) than those aged over 35 years (54%), i.e., they had a better command of the subject. In the opposite direction, in a study conducted among family members of a TB patient, it was found, for this dimension, individuals of higher age group with substantial knowledge about the disease, which infers the close relationship with the patient and the disease, establishing a concrete causal link (QUEIROZ *et al.,* 2016).

Nevertheless, age is not exactly a definitive limiting factor for the acquisition of knowledge: studies conducted among PA in the United States revealed that older people had a positive influence due to their experience, lower rates of absenteeism, higher levels of cooperation and commitment to work, which enhances the experience among peers learning relationships (CAPPELLI; NOVELLI, 2010).

In this study, it was observed that those with incomplete higher education had more satisfactory knowledge observed by the data presented. In opposition to this condition, in research with inmates in northern Ethiopia, the group that showed better knowledge was

contained in those who finished at least high school, that is, with more than eight years of schooling (ADANE *et al*., 2017), data that suggest a direct relationship between learning and general knowledge expected for the professional activity under discussion, including on health.

The length of experience as a PA and the assistance to PDL with TB seem to have positively influenced the level of knowledge, a conclusion based on the data presented: just as experience and information learned become a valuable source of knowledge, professional experimentations aimed at the work routine allow these events to add learning value, so that one can consider them as a process of permanent education in the journey of each individual (NADEAK, 2018).

Participation in training and capacity building courses indicates that they influence the knowledge of PAs, as the highest frequency of subjects classified with knowledge above the percentage of hits is in this group. The training courses for PAs have the topic of health in their curriculum. The content is based on the National Curricular Matrix for Education in Prison Services, which includes the most frequent infectious-contagious diseases inside prisons, such as TB (BRAZIL, 2014).

However, the research showed more than 70% of wrong answers about TB, suggesting that the approach on the subject in the training course was not objective for the teaching-learning binomial, perhaps because it was a methodology without an adequate connection to the reality experienced by the PA and their daily routine, as they still had no contact with the reality of their work, since the training course is one of the requirements for taking office in the penitentiaries, and is conducted prior to taking office (BRAZIL, 2014).

Among the obstacles enunciated so far and that prevent adequate TB control in penitentiaries are the stigmatizing attitudes and insufficient knowledge about TB among PDLs and penitentiary professionals, restricting the ability to promote diagnosis and treatment in prison (BRAZIL, 2017).

Taking into account these data, HPS is proposed as a space for in-service training, which aims at learning and familiarity with frequent diseases in this environment, meeting the expectations for the improvement of knowledge, adopting methodologies that are not aligned with the conventional, being concerned with meaningful learning, as it differs from passive traditionalism by adopting the construction of strategies contextualized with the daily work environment (WAISBORD, 2010).

In accordance with this procedural line, and here we are dealing with teaching in service, we suggest intersectoral mechanisms for the discussion of a proposal for PHE among the

schools, the Penitentiary Health Team, the Basic Health Unit of reference of the prison, and the Municipal and State TB Control Program, with the intention of preparing the HCW as a strategic ally to mediate TB control among the PLWs, converging with what the National Control Program of the World Health Organization recommends for the reduction of TB cases inside prisons and, consequently, outside of them (BRAZIL, 2005).

Among all the PAs in this study, 40.5% believed that a virus could cause TB, and only 34.0% knew that it was caused by a bacterium. Among the HCWs who have had contact with the topic of TB in their training courses, only 30% of them were correct on the aforementioned question, a percentage slightly lower than that of family members of patients undergoing TB treatment in São Paulo, as 31.8% cited the bacteria as the cause of TB (OLIVEIRA; CARDOSO, 2004).

Regarding TB symptoms, most symptoms were recognized by the HCWs, especially coughing up blood, coughing up phlegm, and coughing for more than three weeks, as observed in a study among PAs in Rio Grande do Sul (BERLT *et al*., 2021), which contributes to the identification of a possible TB-sick PA. However, the vast majority mistakenly believe that fever without clear cause for more than seven days, severe headache, nausea, and chest pain are also symptoms linked to the disease.

However, a study on TB knowledge conducted in another setting also pointed to other symptoms, such as chest pain associated with TB. Among PDL it was one of the most mentioned symptoms, as well as among family members with TB in the survey conducted in Ribeirão Preto, São Paulo (FERREIRA-JUNIOR; OLIVEIRA; MARIN-LÉON, 2013).

The importance of clinical examinations is highlighted so that health professionals can confirm suspicions when an individual is ill with TB (SIQUEIRA, 2012). Thus, if PAs are able to recognize the classic signs and symptoms of TB, and attitudinally refer the suspected case to the health team, they would play a strategic role in the diagnosis so that the treatment is timely, avoiding the vectorial spread of the disease in this environment and promoting health within prisons.

This observation is in line with what is proposed in the PHE training axis, especially for health, when it comes to the horizontalization and democratization of this tool, bringing the health promoter agent as co-responsible for the construction of the work process (SILVA *et al.*, 2017).

Following the scope of the analysis on the topic of knowledge regarding the forms of transmission and how to avoid TB, it was observed that there are conceptual doubts and

perceptual misconceptions, and the results were related, since the ways to avoid it reflect the forms of transmission, since 94.3% believe that contact with saliva, i.e., sharing dishes, cutlery and glasses, is one of the forms of transmission. Other ways mentioned by approximately 50% of them were through handshakes, sexual contact and touching public items, being manifestation of incorrect knowledge in values higher than those found among PA in Santa Cruz do Sul (BERLT *et al.*, 2021).

The operative insufficiency in the critical knowledge among professionals about the form of transmission and prevention of TB transmission inspires alert and concern, since a detainee with the active pulmonary form excretes viable bacilli through aerosols that can contaminate members of the prison population. The recommendation in health institutions, and by analogy for the prison space, is the adoption of administrative measures, environmental control and individual protection (FREITAS *et al*., 2015).

Patients with HIV-Aids were considered a risk group by the PAs, citing immunodeficiency, as observed in another study (FERREIRA-JÚNIOR; OLIVEIRA; MARIN-LÉON, 2013). Moreover, HIV-AIDS is a public health problem effectively discussed in society by educators and health professionals. Moreover, the government has long invested in media campaigns and health education, something that does not occur with the same rigor for TB.

Some information about the disease was very clear among most of the professionals surveyed, since they knew that the disease is curable with specific drugs, the minimum time of treatment, the tests required for diagnosis of pulmonary TB and the priority actions, in agreement with other studies (FELIPE *et al*., 2021; BERLT *et al*., 2021).

With regard to attitudes, when asked about the reaction they would have if they became ill with TB, it was found that fear was frequent. On the other hand, according to Ferreira-Junior, Oliveira HB, and Marin-Léon (2013), the PA at Hortolândia Penitentiary had the feeling of sadness as the most frequently mentioned, and fear was the second most frequent. This fact should be considered relevant, since feelings like this hinder treatment adherence (REGO *et al*., 2017).

Possibly due to fear of stigmatization, the vast majority of respondents reported that they would not tell anyone if they contracted the disease. On the other hand, the most frequent attitude was to seek the health unit as soon as they noticed the first symptoms, results similar to those found in a study in São Paulo (FERREIRA-JUNIOR; OLIVEIRA; MARIN-LÉON, 2013).

It is understood that only one third of the PAs consider themselves well informed about TB, that the vast majority are interested in obtaining more information about the disease and that the medium considered most effective to acquire information about TB, according to them, among a list of resources, was television. It is noteworthy that there is a need to organize strategies to discuss the implementation of teaching-learning actions within the scope that HPS is conceptually understood.

The problematization of issues to be discussed through PHE is one of the ways to build knowledge among adults, resulting in a transformation of practices, allowing continuous learning (REGO *et al*., 2017). Therefore, PE can be an effective way to achieve the objectives of the National Health Plan for the Penitentiary System and the recommendations of the National Tuberculosis Control Program.

As a limitation, the answers given by the participants may not fully reflect their views due to the work environment. Knowledge *per se* has several definitions, is difficult to measure, especially with the application of a questionnaire, and there may be impregnations of social, religious or even intrinsic personal nature, which lead the professional differently from what is expected by the PHE process, generating a perception of relations with the PDL hat prevent the effective involvement with the process.

Final remarks

Public health is constantly searching for tools that can contribute to health promotion and control diseases of great social impact, in the strict case of TB, as it is considered one of the major public health problems worldwide and especially in prisons, with impacting numbers of patients and deaths, making it necessary that other subjects, in addition to the formally constituted health teams, are engaged in this confrontation. The reflection on TB control among PDLs, based on the PAs, is relevant as research, and necessary, since there is a shortage of studies with this approach.

It is essential to invest in actions for the implementation of PHE in the prison service, valuing the strategic role of the PAs as mediators between the PDLs and the health service, engaging them as health promoters in the health-disease process with the PLWs, the people involved in prison work and the external community.

There are other elements that can contribute to decrease the cases of TB inside prisons, however, there is a need to advance in the implementation of a teaching-learning process and

in studies on the knowledge of practices and attitudes of these professionals regarding TB, since their role and their influence/potentiality in the advancement of the objectives of disease control inside prisons is factually presented in this study.

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APPENDIX 1

Table 1 - Sociodemographic and complementary profile of prison guards according to their level of knowledge about tuberculosis, Foz do Iguaçu -PR, 2017

VARIABLES		KNOWLEDGE		LITTLE KNOWLEDGE		TOTAL	
		n	%	n	%	(n)	%
Gender (103)	Female	3	50	3	50	6	5, 8
	Male	58	60	39	40	97	94,2
Age (102)	18 to 35	32	74	11	26	43	42,0
	Over 35	32	54	27	46	59	58,0
Education (101)	Complete high school	4	50	4	50	8	7,9
	Incomplete Higher Education	7	87,5	1	12,5	8	7,9
	Higher Education	53	63	31	37	84	83,3
	Master Degree Doctorate	0	0	1	100	1	0,9
Time you have been a Penitentiary Agent (106)	Up to 3 years	3	50	3	50	6	5,7
	More than 3 years	64	64	36	36	100	94,3
Did you attend a training course before starting as a Penitentiary Agent? (106)	Yes	65	64	36	36	101	95,3
	No	02	40	03	60	05	4,7
Did you attend a training course? (106)	Yes	38	68	18	32	56	52,8
	No	29	58	21	42	50	47,2
Have you ever heard of tuberculosis? (105)	Yes	66	63	39	37	105	100,0
	No	0	0	0	0	0	0,0
Did you have a class on TB in high school? (104)	Yes	30	62,5	18	37,5	48	46,4
	No	36	64	20	36	56	53,6
Have you assisted a PDL patient with TB? (102)	Yes	54	63,5	31	36,5	85	83,3
	No	10	59	7	41	17	17,9
Do you know anyone who has TB? (103)	Yes	53	63	31	37	84	81,5
	No	13	68	6	32	19	18,5
Do you consider yourself well informed about TB? (99)	Yes	23	72	9	28	32	32,3
	No	39	58	28	42	67	67,7
Want more information about TB? (98)	Yes	55	64	31	36	86	87,7
	No	07	58	05	42	12	12,3

Source: Prepared by the authors

APPENDIX 2

Table 2 - Classification of knowledge about tuberculosis among Penitentiary Agents, Foz do Iguaçu-PR,2017

VARIABLES (106)		**CORRECT**		**INCORRECT**	
		n	**%**	**n**	**%**
Tuberculosis as a serious disease		85	80	21	20
TB severity as a country and region		57	53,7	49	46,3
The TB-causing microorganism		36	33,9	70	66,1
Signs and symptoms of TB	Dry cough	53	50	53	50
	Cough with phlegm	80	75,4	26	24,6
	Cough that lasts longer than three weeks	82	77,4	24	22,6
	Coughing up blood	84	79,	22	20,8
	Splitting headache	26	24,5	80	75,5
	Nausea	31	29,3	75	70,7
	Weight loss	82	77,3	24	22,7
	Chest pain	32	30,2	74	69,8
	Shortness of breathe	73	68,9	33	31,1
	Fever with no clear cause that lasts more than seven days	09	8,5	97	91,5
	Fatigue	74	69,8	32	30,2
Transmissibility period after starting treatment		54	50,9	52	49,1
Minimum duration of TB treatment		75	70,8	31	29,2
Forms of Transmission	Through handshakes	57	53,8	49	46,3
	Insect bites	81	76,4	25	23,6
	Through the air when a person with TB coughs or sneezes	102	96,2	04	3,8
	Sexual intercourse	51	48,1	55	51,9
	Contact with saliva (kissing, sharing plates and cutlery)	06	5,7	100	94,3
	Touching public items like door handles, carrying handles	46	43,4	60	56,6
	Avoiding handshakes	52	49,1	54	50,9
	Covering nose and mouth when breathing	90	84,9	16	15,1
	Avoiding sharing cutlery, plates and cups	08	7,5	98	92,5
	Wash your hands after touching public items	12	11,3	94	88,7
TB prevention	Closing the windows at home	76	71,7	30	28,3

	Through good nutrition	50	47,2	56	52,8
	Use of condoms	51	48	55	52
	Use of repellents	72	67,9	34	32,1
	Avoiding being in the same environment as people with TB	92	86,8	14	13,2
People who can be infected	Any person	73	68,9	33	31,1
There is a cure for TB	Yes/No	89	84	17	16
Ways to cure TB	Through herbs and teas	68	64,2	38	35,8
	With rest and without medication	67	63,2	39	36,8
	Taking vaccine	34	32,1	72	67,9
	Praying	53	50	53	50
	With specific medications	99	93,4	07	6,6
Required exams to come true the diagnosis of PULMONARY TB	Sputum Bacilloscopy	86	81,1	20	18,9
	Sputum culture	94	88,7	12	11,3
	Chest X-ray	61	57,5	45	42,5
	Tomography	44	41,5	62	58,5
	Active search for respiratory symptoms	59	55,7	47	44,3
	Request for sputum smear microscopy when TB is suspected	89	84	17	16
Priority actions for the TB control in penitentiaries	Notification of confirmed cases	89	84	17	16
	Guidance to the patient and family members about the need for Directly Observed Treatment (DOT)	81	76,4	25	25,6
	Examination of people who live with the TB patient	88	83	18	17

Source: Prepared by the authors

APPENDIX 3

Table 3 - Correctional Officers' attitudes about themselves regarding tuberculosis, Foz do Iguaçu - PR, 2017

			n.	%
Do you think you might catch TB? (n=104)		**Yes**	103	99,0
		No	1	1,0
Reaction if you found out you have TB (n=104)	Fear	**Yes**	34	32,7
		No	70	67,3
	Surprise	**Yes**	24	23,1
		No	80	76,9
	Shame	**Yes**	1	1,0
		No	103	99,0
	Embarrassment	**Yes**	4	3,9
		No	100	96,1
	Sadness	**Yes**	3	2,9
		No	101	97,1
	No reaction	**Yes**	22	21,1
		No	82	78,9
Who would you tell if you had TB (n=104)	Spouse	**Yes**	87	83,6
		No	17	16,4
	Physician or other health worker	**Yes**	87	83,6
		No	17	16,4
	Parent	**Yes**	60	57,7
		No	44	42,3
	Other family member	**Yes**	55	52,9
		No	49	47,1
	Close friend	**Yes**	49	47,1
		No	55	52,9
	No one	**Yes**	93	89,4
		No	11	10,6
First thing you would do if you notice the symptoms of TB (104)	Go to the health unit	**Yes**	103	99,0
		No	1	1,0
	Go to the pharmacy	**Yes**	2	1,9
		No	102	98,1
	I would go to a Benedictine	**Yes**	0	0
		No	104	100
	Would look for other options of treatment, e.g., herbs	**Yes**	0	0
		No	104	100
If you had symptoms of TB, at what point would you go to the health unit?	When treatment on its own did not work		3	2,9
	After three to four weeks with symptoms		4	3,9
	As soon as you notice TB symptoms		88	84,5

(104)	Invalid response	5	4,8
	No response	4	3,9

Source: Prepared by the authors

APPENDIX 4

Table 4 - Attitudes of PAs towards tuberculosis, Foz do Iguaçu - PR, 2017

Cost of TB diagnosis and treatment in Brazil (104)	It's free		93	89,4
	Reasonably priced		2	1,9
	It's a little expensive		3	2,9
	Very expensive		6	5,7
Feeling about people people sick with TB (104)	I feel compassion and want to help		35	33,6
	I feel compassion, but I prefer to stay away from these people		4	3,9
	I am afraid because they can infect me		11	10,6
	I have no special feelings		45	43,3
	Other		9	8,6
People living with HIV-AIDS should be concerned about TB (104)		**Yes**	97	93,3
		No	2	1,9
		No response	5	4,8
If the answer to the previous question is yes, why? (104)	The person with HIV-AIDS is more likely to develop TB		64	61,5
	Don't know		9	8,6
	Other		20	19,3
	No answer		11	10,6
Do you consider yourself well informed about TB? (104)		**Yes**	31	30,0
		No	65	62,4
		No response	8	7,6
Do you want to get more Means considered effective to transmit information about TB		**Yes**	83	80,0
		No	10	9,4
		No response	**11**	**10,6**
	Newspapers and Magazines	**Yes**	43	41,3
		No	61	58,7
	Radio	**Yes**	32	30,8
		No	72	69,2
	TV	**Yes**	65	62,5
		No	39	37,5
	Internet	**Yes**	59	56,7
		No	45	43,3
	Facebook	**Yes**	32	30,7
		No	72	69,3
	Billboards	**Yes**	15	14,4

(104)		**No**	89	85,6
	Brochures, posters, and other printed materials	**Yes**	41	39,4
		No	63	60,6
	Health care workers	**Yes**	60	57,7
		No	44	42,3
	Family, friends, neighbors, and colleagues	**Yes**	12	11,5
		No	92	88,5
	Religious leaders	**Yes**	11	10,6
		No	93	89,4
	Teachers	**Yes**	23	22,1
		No	81	77,9

Source: Prepared by the authors

APPENDIX 5

Table 5 - Description of the knowledge and attitudes about tuberculosis among Penitentiary Agents according to previous contact with the topic of tuberculosis in a training course, Foz do Iguaçu-PR, 2017

Knowledge and beliefs about tuberculosis			Contact with the topic of tuberculosis						p-value
			Yes		No		Total		
			N	(%)	N	(%)	N	(%)	
TB as a serious disease		Correct	20	30	15	44	35	35	0,062
		Incorrect	46	70	19	56	65	65	
Severity of TB in the country and region		Correct	34	51,5	21	61,7	55	55	0,329
		Incorrect	32	48,5	13	38,7	45	45	
Causative microorganism		Correct	20	30	15	44	35	35	0,170
		Incorrect	46	70	19	56	65	65	
Period of transmissibility after the start of treatment		Correct	34	51	18	53	52	52	0,892
		Incorrect	32	49	16	47	48	48	
Minimum duration of treatment		Correct	45	68	27	80	72	72	0,236
		Incorrect	21	32	7	20	28	28	
Is TB curable?		Correct	55	83	28	82	83	83	0,901
		Incorrect	11	17	6	18	17	17	
Type of medicine used in the treatment of TB		Correct	61	92	33	97	94	94	0,355
		Incorrect	5	8	1	3	6	6	
Symptoms of Tuberculosis	Dry cough	Correct	31	47	19	56	50	50	0,398
		Incorrect	35	53	15	44	50	50	
	Productive cough	Correct	52	79	26	76	78	78	0,791
		Incorrect	14	21	8	24	22	22	
	Coughing for more than three weeks	Correct	54	82	27	79	81	81	0,335
		Incorrect	12	18	7	21	19	19	
	Hemoptysis	Correct	54	82	27	38	25	25	0,771
		Incorrect	12	18	7	21	19	19	
	Headache	Correct	12	18	13	38	25	25	0,282
		Incorrect	54	82	21	62	75	75	
	Nausea	Correct	17	26	13	38	30	30	0,197
		Incorrect	49	74	21	62	70	70	
	Weight loss	Correct	53	80	26	76	79	79	**0,028**
		Incorrect	13	20	8	24	21	21	
	Chest pain	Correct	49	74	23	68	72	72	0,486
		Incorrect	17	26	11	32	28	28	
	Shortness of breath	Correct	48	73	23	68	71	71	0,595
		Incorrect	18	27	11	32	29	29	
	Fever for more than seven days without apparent cause	Correct	5	8	3	9	8	8	0,827
		Incorrect	61	92	31	91	92	92	
Forms of transmission	Handshake	Correct	39	59	17	50	56	56	0,385
		Incorrect	27	41	17	50	44	44	
	Insect bite	Correct	55	83	22	65	77	77	**0,036**
		Incorrect	11	17	12	35	23	23	
		Correct	63	95	33	97	96	96	0,698

	Through the air when the person with TB coughs or sneezes	Incorrect	3	5	1	3	4	4	
	Sexual intercourse	Correct	35	53	14	41	49	49	0,261
		Incorrect	31	47	20	59	51	51	
	Saliva (kissing, sharing glasses, cutlery)	Correct	3	4	3	9	6	6	0,393
		Incorrect	63	96	31	91	94	94	
	Touching public items, such as	Correct	31	47	14	41	45	45	0,581
		Incorrect	35	53	20	59	55	55	
How to avoid TB?	Avoid shaking hands	Correct	32	48	19	56	51	51	0,483
		Correct	34	52	15	44	49	49	
	Using repellent	Correct	50	76	18	53	68	68	**0,020**
		Incorrect	16	24	16	47	32	32	
	Covering the mouth and nose when coughing or sneezing	Correct	58	88	27	79	85	85	0,261
		Incorrect	8	12	7	21	15	15	
	Avoiding being in the same environment as people with TB	Correct	61	92	27	79	88	88	0,057
		Incorrect	5	8	7	21	12	12	
	Using condoms	Correct	33	50	17	47	49	49	0,780
		Incorrect	33	50	18	53	51	51	
	Avoid sharing cutlery and glasses	Correct	4	6	3	9	7	7	0,607
		Incorrect	62	94	31	91	93	93	
	Wash hands after touching public items	Correct	7	11	4	12	11	11	0,860
		Incorrect	59	89	30	88	89	89	
	Closing windows	Correct	51	77	21	62	72	72	0,101
		Incorrect	15	23	13	38	28	28	
	Good nutrition	Correct	35	53	13	20	48	48	0,160
		Incorrect	31	47	21	80	52	52	
Tests required for the diagnosis of pulmonary TB	Sputum smear microscopy	Correct	57	86	25	74	82	82	0,113
		Incorrect	9	14	9	26	18	18	
	Sputum culture	Correct	40	61	19	56	59	59	0,057
		Incorrect	26	39	15	44	41	41	
	Chest X-ray	Correct	40	61	19	56	59	59	0,649
		Incorrect	26	39	15	44	41	41	
	Tomography	Correct	24	36	18	53	42	42	0,111
		Incorrect	42	64	16	47	58	58	
Priority actions to accomplish the diagnosis of pulmonary TB	Active search for respiratory symptomatic patients	Correct	44	66,6	13	38,2	57	57	**0,006**
		Incorrect	22	33,3	21	61,8	43	43	
	Request for sputum smear microscopy when TB is suspected	Correct	58	88	26	76,4	84	84	0,140
		Incorrect	8	12	8	23,6	16	16	
	Notification of confirmed cases	Correct	57	86,3	26	76,4	83	83	0,212
		Incorrect	9	13,7	8	23,6	17	17	
	Orientation to patients and family members about the need to take directly observed treatment	Correct	54	82	23	68	87	87	0,110
		Incorrect	12	18	11	32	23	23	
	Testing of people living with the TB patient	Correct	58	88	25	73,5	83	83	0,070
		Incorrect	8	12	9	26,5	17	17	

Source: Prepared by the authors

CRediT Author Statement

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