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Tuberculosis: knowledge among nursing undergraduate students

Tuberculose: conhecimento entre alunos de graduação em enfermagem

Tuberculosis: conocimiento entre alumnos de graduación de enfermería

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ABSTRACT

Objective: To analyze the knowledge about tuberculosis among nursing undergraduate students of a Federal Higher Education Institution. **Method**: Descriptive cross-sectional study, with quantitative approach. Data were collected through a questionnaire based on the WHO's guide to developing evaluation instruments on knowledge, attitudes and practices related to TB. Students were classified as "with knowledge" and "with little knowledge" based on the mean percentage of correct responses to the variables analyzed. Descriptive statistics techniques were used. **Results**: 60 nursing students were interviewed. "with little knowledge" was observed among students who were studying at the university for less time and who had no previous contact with the subject, and "with knowledge" was observed among those whose knowledge about tuberculosis was acquired in the health services. **Conclusion:** Knowledge gaps among undergraduate nursing students were identified, suggesting the need to rethink teaching-learning strategies on the subject.

Descriptors: Tuberculosis; Knowledge; Attitude; Nursing Students; Health Education.

RESUMO

Objetivo: Analisar o conhecimento sobre a tuberculose entre alunos de graduação de Enfermagem de uma Universidade Federal de Ensino Superior. **Método**: Estudo descritivo realizado de maneira transversal, com abordagem quantitativa. Os dados foram coletados por meio de questionário elaborado com base no guia da OMS para desenvolvimento de instrumentos de avaliação de conhecimento, atitudes e práticas relacionados à tuberculose. Os alunos foram categorizados em grupos de "conhecimento" e "pouco conhecimento" com base no percentual médio de respostas para as variáveis analisadas. Utilizaram-se técnicas de estatística descritiva. **Resultados**: Entrevistaram-se 60 alunos de enfermagem. Observou-se "pouco conhecimento" entre alunos com menor tempo de estudo na universidade e sem contato prévio com o tema e "conhecimento" entre aqueles cujo conhecimento sobre a tuberculose foi adquirido nos serviços de saúde. **Conclusão:** Identificaram-se falhas no conhecimento entre alunos de graduação em enfermagem, sugerindo necessidade de repensar estratégias de ensino-aprendizagem sobre o tema.

Descritores: Tuberculose; Conhecimento; Atitude; Estudantes de Enfermagem; Educação em Saúde.

RESUMEN

Objetivo: analizar el conocimiento acerca de la tuberculosis entre alumnos de graduación de Enfermería de una Universidad Federal de Enseñanza Superior. **Método**: se trata de un estudio descriptivo, de abordaje cuantitativo, realizado de manera transversal. Los datos se recogieron con un cuestionario basado en la guía de la OMS para el desarrollo de instrumentos de evaluación sobre conocimientos, actitudes y prácticas relacionadas con la tuberculosis. Los alumnos se categorizaron en grupos de "conocimiento" y "poco conocimiento", según el promedio de respuestas para las variables analizadas. Se utilizaron técnicas de estadística descriptiva. **Resultados**: de los 60 alumnos entrevistados, se advirtió "poco conocimiento" entre los que tenían menos tiempo de estudio en la universidad y prácticamente ningún contacto anterior con el tema, y "conocimiento", entre aquellos que habían aprendido sobre la tuberculosis en los servicios de salud. **Conclusión:** el conocimiento sobre la tuberculosis entre alumnos de graduación de enfermería es exiguo, lo que demuestra la necesidad de repensar estrategias de enseñanza-aprendizaje sobre el tema.

Descriptores: Tuberculosis; Conocimiento; Actitud; Estudiantes de Enfermería; Educación en Salud.

INTRODUCTION

Tuberculosis (TB) is the infectious disease that kills the most people in the world, with 1.8 million deaths in 2015, according to estimates from the World Health Organization (WHO). The BRICS countries (Brazil, Russia, India, China and South Africa) carry 50% of the global burden of tuberculosis, and Brazil ranks 20th in the prevalence of the disease[1].

Given its priority, WHO implemented the DOTS strategy (Directly Observed Treatment, short-course) in several countries where TB was a public health problem. In Brazil, this strategy began to be implemented in several cities in 1999, when the Ministry of Health (MH) launched the National Tuberculosis Control Plan (NTCP), establishing guidelines to reach the targets of case detection (70%), treatment success (85%) and treatment dropout (lower than 5%)[2]. However, almost two decades after the implementation of the DOTS strategy, and even after recommending additional measures to control the disease, the country still has a high incidence and mortality related to TB[1].

Given the current priority of TB in the agenda of the Brazilian MH, the "National Plan to eliminate Tuberculosis as a Public Health Problem" was recently launched in 2017. It complies with the WHO End TB Strategy, which establishes the goal of reducing TB incidence to below 10 cases per one hundred thousand people by 2035, and below one case per million inhabitants by 2050. To achieve this, the work of those involved must cover three pillars: integrated patient-centered care and prevention; bold policies and supportive systems; and intensified research and innovation[3].

Based on these pillars, the plan expects to identify the gaps that have led to difficulties for the early diagnosis and treatment of TB and for an adequate follow-up of these patients. Regarding the factors related to health services, the lack of knowledge and training of professionals has been pointed out as one of the aspects that must be addressed, since it can lead to an increased risk of nosocomial infection and can impair health surveillance actions, which are intrinsic and essential to the control and prevention of TB[4-9].

Studies indicate that a large number of nurses working in Brazilian Primary Health Care Units, Hospitals and Prisons, as well as nursing undergraduates, encountered difficulties in carrying out TB control actions[4-5,10-13]. These professionals must be better trained on the disease in order to gain professional autonomy for the development of integrated and multi-professional actions[5,12-14].

Thus, considering the essential role of nurses in the control and prevention of TB, their qualification to face the problem must include theory and practical activities during their undergraduate education, enabling them to manage the disease and to enter the labor market with knowledge to implement new strategies[7,10,15-17].

However, since training on TB is not always sufficient to prepare professionals to deal with the disease[17], it is necessary to evaluate the level of knowledge of the professionals and the structure of this training in education programs, in order to adapt teaching strategies to the knowledge gaps identified[4-5].

Considering the relevance of TB as a public health problem, and assuming that the lack of knowledge about this disease can jeopardize and lead to inappropriate behavior regarding exposure, prevention and management of TB, it is important to identify the level of knowledge about TB among nursing students, as a way to prepare them for the labor market.

OBJECTIVE

To evaluate knowledge on tuberculosis among undergraduate nursing students of a Federal Higher Education Institution.

METHOD

Ethical aspects

This study was approved by the Research Ethics Committee Involving Human Beings of the Federal University of Mato Grosso do Sul and complies with all the ethical precepts established in resolution 466/12 of the National Health Council.

Design, setting and period

This is a cross-sectional descriptive study, with a quantitative approach, carried out in 2016 in a Nursing undergraduate course of a Federal University located in the city of Três Lagoas, MS. This undergraduate course began its activities in 2000 and currently has a Curriculum with 4,080 credit hours offered in 10 semesters, in the morning period.

Population or sample: inclusion and exclusion criteria

The study participants were selected by convenience sampling, which included all students over 18 years old enrolled in the sixth to tenth period of the undergraduate nursing course of that institution. The participants read and signed the Consent Term. During the study period there were 115 students enrolled in the course, of whom 60 were enrolled in the periods selected. Those who, although enrolled, were not attending classes for more than one consecutive month, those who were not located in the University after three contact attempts and those who transferred the course to another Higher Education Institution were excluded.

Data were collected from September to December 2016, through a self-administered questionnaire based on the WHO's guide to developing evaluation instruments on knowledge, attitudes and practices related to TB[18], and on publications that address the most relevant actions for TB control in Brazil, such as the "Manual of Recommendations for the Control of Tuberculosis"[19] and the "Nursing Protocol for the Directly Observed Treatment of Tuberculosis"[20]. This instrument contained questions related to the socio-demographic profile of undergraduate students and variables related to knowledge on TB.

In order to verify the adequacy and accuracy of the items in the data collection instrument and the content representativeness, the instrument was submitted to content evaluation, carried out by seven professionals specialized in the subject. Data collection only began after the instrument was adapted according to the experts' suggestions.

Nursing students were approached in the University, at the end of the classes they were attending during the period of data

collection. After clarifying the objectives and method of the study, the researchers invited the students to participate in the study. After reading and signing of the Informed Consent Term, the participants filled the data collection instruments. All the students approached accepted to participate in the study, so there were no losses or refusals. Thus, 60 nursing students were included.

Analysis of results and statistics

The data were initially arranged and double-checked in an Excel spreadsheet. After verifying for transcription errors, the data were exported to STATISTICA 12.0 software from StatSoft®. Descriptive statistics were used for the analysis of the data.

To verify the association between knowledge and beliefs about TB and previous contact with the topic "TB", the Chi-square test or the Fisher's exact test were applied. "Prior contact with the theme" was considered when the students reported they had given assistance or met someone with TB or had already attended a class on the subject.

In order to classify the level of knowledge on TB, the following variables were corrected according to the information on the "Manual of Recommendations for Tuberculosis Control" and classified as correct or Incorrect: "TB symptoms", "microorganism agent", "transmission period after beginning treatment", "minimum duration of treatment", "modes of transmission", "ways to avoid and cure TB", "types of medication for TB", "cure for TB", "diagnostic exams for pulmonary TB" and "priority actions for TB control". After this correction, a cut-off point regarding the correct answers was established based on the mean percentage of all the participants. From this, two groups were defined: one composed of students whose percentage of correct answers was greater than the mean, who were classified as "with knowledge"; and another group, composed of those whose scores were less than the mean percentage, classified as "low knowledge".

RESULTS

The sample consisted of 60 nursing students, most of them female (90%), aged 18 to 25 years (71.7%), who had 2 to 3 years of university education (60%), and had already performed practical activities in hospital and primary care services (85% and 81.7%, respectively). More than half of the nursing students (55%) had not had previous contact with the topic of TB (provided assistance, knew someone with TB or had a class on the subject), did not consider themselves well-informed on the subject (56.7%) and wanted to know more about it (98.3%); however, all of them (100%) reported having heard about TB, especially at University (76.7%) (Table 1).

Regarding the level of knowledge on TB, the majority (73.3%) reported that the microorganism agent was bacteria, while approximately a quarter of the students reported that it was a virus (26.7%). Regarding the symptoms of the disease, all the participants agreed that cough lasting more than three weeks is one of the symptoms of the disease (100%), although they were not sure if it was dry (70%) or productive (76.7%). Most participants reported that hemoptysis is among classic TB symptoms (81.7%), as well as chest pain (66.7%), shortness of breath (90%), and fever of unknown origin for more than seven days (73.3%). Approximately a quarter of the students (23.3%) were unaware of the minimum duration of TB treatment, which is one year (Table 1).

There were participants who reported that the transmission of TB occurs via contact with saliva (75%), handshake (25%), touch/contact with public objects (43.3%), sexual contact (8,3%) and insect bite (1.7%). Regarding the prevention of the disease, the participants stated that to avoid contamination by the bacillus it is necessary to not share cups and cutlery (75%), avoid handshakes (26.7%), wash hands after touching public objects (78, 3%), use condoms (20%) and use repellent (13.3%). The students did not relate good nutritional status to vulnerability to TB (63.3%).

One nursing student stated that TB had no cure (1.7%). Although all (100%) answered that TB cure occurs through "specific" medications, some (12.3%) students did not know that these medications were antibiotics. Some participants also pointed as cures for TB the vaccine (38.3%) and praying (18.3%) (Table 1).

Sputum smear microscopy and chest x-ray were not cited as the main diagnostic methods for TB (6.7% and 23.3%, respectively). Some students did not believe that they could contract the disease (13.3%), and some considered it not severe (25%) (Table 1).

The analysis of the knowledge and beliefs of nursing students on TB compared to their previous contact with the subject showed that, among those who had previous contact with the subject, basic questions were answered incorrectly: microorganism agent (33.3%), transmission period after beginning of treatment (44.4%), type of medication used in the treatment (14.8%), and the main symptoms of the disease: dry cough (77.8%), hemoptysis (85.2%), headache (44.4%), chest pain (63%), shortness of breath (88.9%) and fever of unknown origin for more than seven days (22.2%). Regarding the forms of transmission, handshake (22.2%), sexual contact (14.8%), saliva (74.1%) and touching public objects (37%) were also cited incorrectly (Table 2). Sputum smear microscopy and chest x-ray were not pointed as classical methods of diagnosing pulmonary TB by all students (11.1% and 25.9% answered incorrectly) (Table 2).

However, it was also noted that those who did not have prior contact with the topic of TB had approximately the same amount of correct answers on the knowledge variables as those who had already had contact with the subject (Table 2).

Those who responded correctly to the variable "minimum duration of TB treatment" had already had contact with the theme (92.6%), and there was a statistically significant association between these variables (p=0.008) (Table 2).

Regarding priority actions for TB control in health services, there was a higher percentage of correct answers among students who reported having had prior contact with TB (Table 2).

The analysis of the knowledge of nursing students about TB revealed that those aged between 26 and 31 years had greater knowledge about the subject (31.3% with knowledge x 25% with little knowledge). Those who were at the university for less time (up to three years) had less knowledge about TB ("with little knowledge" 71.5% x 50% "with knowledge"). Students who had already performed both the practical activity/internship in the hospital context and the practical activity/internship in Primary Care were classified as having "little knowledge" about TB (89.3% in Primary Care and 92.9% in the hospital) (Table 3).

Table 1 - Sociodemographic profile and characterization related to knowledge, beliefs, attitudes and experience in tuberculosis, Três Lagoas, Mato Grosso do Sul, Brazil, 2016

Variables	n (60)	% (100%)
Socio-demographic		
Gender		
Male	6	10
Female	54	90
Age		
18 to 25 years	43	71.7
26 to 31 years	17	28.3
Time of university education		
2 to 3 years	36	60.0
4 to 6 years	24	40
Practical activities/internship in:		
Hospital Services?		
Yes	51	85
No	9	15
Primary Care Services?		
Yes	49	81.7
No	11	18.3
Experience related to TB		
Previous contact with the subject "TB"		
Yes	27	45
No	33	55
Where did they hear about TB?		
Health Service	10	16.7
University	46	76.7
Means of communication	4	6.6
Consider themselves well informed about TB		
Yes	26	43.3
No	34	56.7
Wants to know more about TB		
Yes	59	98.3
No	1	1.7
Knowledge on TB		
Microorganism agent		
Virus	16	26.7
Bacteria	44	73.3
TB Symptoms		
Dry cough		
Yes	42	70
No	18	30
TB Symptoms		
Yes	46	76.7
No	14	23.3
Cough lasting more than 3 weeks		
Yes	60	100
No	0	0
Hemoptysis		
Yes	49	81.7
No	11	18.3
Headache		
Yes	26	43.3
No	34	56.7
Nausea		
Yes	24	40
No	36	60
Weight loss		
Yes	51	85
No	9	15
Chest pain		
Yes	40	66.7
No	20	33.3
Shortness of breath		
Yes	54	90
No	6	10
Fever of unknown origin for more than 7 days		
Yes	44	73.3
No	16	26.7
Transmission period after beginning of treatment		
Two weeks	30	50
Six months	11	18.3
I don't know	19	31.7
Minimum duration of treatment		
Six months	46	76.7
One year	10	16.7
I don't know	4	6.7
Modes of transmission of TB		
Handshake		
Yes	15	25
No	45	75
Insect bite		
Yes	1	1.7
No	59	98.3
By air		
Yes	58	96.7
No	2	3.3
Sexual contact		
Yes	5	8.3
No	55	91.7
Contact with saliva (kissing, sharing cutlery...)		
Yes	45	75
No	15	25
Touching public objects like doorknobs, handles...		
Yes	26	43.3
No	34	56.7
How to avoid TB		
Avoid handshakes		
Yes	16	26.7
No	44	73.3
Using repellents		
Yes	8	13.3
No	52	86.7
Covering the mouth and nose when coughing or sneezing		
Yes	54	90
No	6	10
Closing windows		
Yes	5	8.3
No	55	91.7
Avoid being in the same environment as people with TB		
Yes	55	91.7
No	5	8.3
Using condoms		
Yes	12	20
No	48	80
Avoid sharing glasses and cutlery		
Yes	45	75
No	15	25
Washing hands after touching public objects		
Yes	47	78.3
No	13	21.7
Good nutrition		
Yes	38	63.3
No	22	36.7
Is TB curable?		
Yes	59	98.3
No	1	1.7

To be continued

Table 1 (concluded)

Variables	n (60)	% (100%)
Ways to cure TB		
Vaccine		
Yes	23	38.3
No	37	61.7
Praying		
Yes	11	18.3
No	49	81.7
Using specific medications		
Yes	60	100
No	0	0
Types of medication used to treat TB		
Antibiotics	52	86.7
Anti-inflammatory	2	3.3
Antivirals	2	3.3
Drug cocktails	4	5.7
Test required to diagnose pulmonary TB		
Sputum smear microscopy		
Yes	56	93.3
No	4	6.7
Chest x-ray		
Yes	46	76.7
No	14	23.3
Sputum culture		
Yes	52	86.7
No	8	13.3
Tomography		
Yes	21	35
No	39	65
Priority actions for TB control in Health Services		
Active Search for Respiratory Symptoms		
Yes	56	93.3
No	4	6.7
Request sputum smear microscopy when suspecting TB		
Yes	55	91.7
No	5	8.3
Notification of confirmed cases		
Yes	60	100
No	0	0
Orient patient/family on the need for the Directly Observed Treatment		
Yes	58	96.7
No	2	3.3
Control contact		
Yes	58	96.7
No	2	3.3
Beliefs and attitudes related to TB		
I believe I can contract TB		
Yes	52	86.7
No	8	13.3
Classification of TB on severity		
Very severe	45	75
A little severe	15	25

Note: TB – Tuberculosis

Most of the nursing undergraduates had heard about TB in the University, but a greater proportion of them were found to have "little knowledge" about TB ("with little knowledge" 78.6% x 75.0% "with knowledge") (Table 3).

There was a higher proportion of students classified as "with knowledge" among those who reported that knowledge about TB was acquired in health services (21.9%) (Table 3). Those who reported having no prior contact with the topic (provided assistance, knew someone with TB or had a class on TB) were classified as "with little knowledge" (60.7%) (Table 3).

Table 2 – Description of knowledge and beliefs about tuberculosis among nursing students of the Federal Higher Education Institution of Mato Grosso do Sul, according to previous contact with the topic, Três Lagoas, Mato Grosso do Sul, Brazil, 2016

Knowledge and beliefs about tuberculosis	Contact with the topic tuberculosis Yes n (%)	No n (%)	TOTAL n (%)	*p* value
Microorganism agent				
Correct	18 (66.7)	26 (78.8)	44 (73.3)	0.290
Incorrect	9 (33.3)	7 (21.2)	16 (26.7)	
Transmission period after beginning of treatment				
Correct	15 (55.6)	15(45.5)	30 (50)	0.436
Incorrect	12 (44.4)	18 (54.5)	30 (50)	
Minimum duration				
Correct	25 (92.6)	21 (63.6)	46 (76.7)	0.008
Incorrect	2 (7.4)	12 (36.4)	14 (23.3)	
Does tuberculosis have a cure?				
Correct	27 (100)	32 (97)	59 (98.3)	0.361
Incorrect	0 (0)	1 (3)	1 (1.7)	
Type of medication used in the treatment				
Correct	23 (85.2)	31 (93.9)	54 (90)	0.260
Incorrect	4 (14.8)	2 (6.1)	6 (10)	
TB Symptoms				
Dry cough				
Correct	6 (22.2)	21 (36.4)	27 (45)	0.234
Incorrect	21(77.8)	12 (63.6)	33 (55)	
Productive cough				
Correct	20 (74.1)	27 (81.8)	47 (78.3)	0.468
Incorrect	7 (25.9)	6 (18.2)	13 (21.6)	
Cough lasting more than 3 weeks				
Correct	26 (96.3)	33 (100)	59 (98.3)	0.264
Incorrect	1 (3.7)	0 (0)	1 (1.7)	
Hemoptysis				
Correct	4 (14.8)	7 (21.2)	11 (18.3)	0.524
Incorrect	23 (85.2)	26 (78.8)	49 (81.7)	
Headache				
Correct	15 (55.6)	19 (57.6)	34 (56.7)	0.875
Incorrect	12 (44.4)	14 (42.4)	26 (43.3)	
Nausea				
Correct	17 (63)	19 (57.6)	36 (60)	0.671
Incorrect	10 (37)	14 (42.4)	24 (40)	
Weight loss				
Correct	25 (92.6)	26 (78.8)	51 (85)	0.136
Incorrect	2 (7.4)	7 (21.2)	9 (15)	
Chest pain				
Correct	10 (37)	10 (30.3)	20 (33.3)	0.581
Incorrect	17 (63)	23 (69.7)	40 (66.7)	
Shortness of breath				
Correct	3 (11.1)	3 (9.1)	6 (10)	0.795
Incorrect	24 (88.9)	30 (90.9)	54 (90)	
Fever of unknown origin for more than 7 days				
Correct	21 (77.8)	23(69.7)	44 (73.3)	0.481
Incorrect	6 (22.2)	10 (30.3)	16 (26.7)	
Forms of transmission				
Handshake				
Correct	21 (77.8)	24 (72.7)	45 (75)	0.653
Incorrect	6 (22.2)	9 (27.3)	15 (25)	

To be continued

Table 2

Knowledge and beliefs about tuberculosis	Contact with the topic tuberculosis Yes n (%)	Contact with the topic tuberculosis No n (%)	TOTAL n (%)	*p* value
Insect bite				
Correct	27 (100)	32 (97)	59 (98.3)	0.361
Incorrect	0 (0)	1 (3)	1 (1.7)	
By air, when the person with TB coughs or sneezes				
Correct	26 (96.3)	32 (97)	58 (96.7)	0.885
Incorrect	1 (3.7)	1 (3)	2 (3.3)	
Sexual contact				
Correct	23 (85.2)	32 (97)	55 (91.7)	0.100
Incorrect	4 (14.8)	1 (3)	5 (8.3)	
Saliva (kissing, sharing glasses and cutlery...)				
Correct	7 (25.9)	8 (24.2)	15 (25)	0.880
Incorrect	20 (74.1)	25 (75.8)	45 (75)	
Touching public objects like doorknobs, handles...				
Correct	17 (63)	17 (51.5)	34 (56.7)	0.373
Incorrect	10 (37)	16 (48.5)	26 (43.3)	
How to avoid TB?				
Avoid handshakes				
Correct	20 (74.1)	24 (72.7)	44 (73.3)	0.906
Incorrect	7 (25.9)	9 (27.3)	16 (26.7)	
Using repellents				
Correct	23 (85.2)	29 (87.9)	52 (86.7)	0.760
Incorrect	4 (14.8)	4 (12.1)	8 (13.3)	
Covering the mouth and nose when coughing or sneezing				
Correct	3 (11.1)	3 (9.1)	6 (10)	0.795
Incorrect	24 (88.9)	30 (90.9)	54 (90)	
Avoid being in the same environment as people with TB				
Correct	25 (92.5)	30 (90.9)	55 (91.7	0.814
Incorrect	2 (7.4)	3 (9.1)	5 (8.3)	
Using condoms				
Correct	22 (81.5)	26 (78.8)	48 (80)	0.795
Incorrect	5 (18.5)	7 (21.2)	12(20)	
Avoid sharing glasses and cutlery				
Correct	7 (25.9)	8 (24.2)	15 (25)	0.880
Incorrect	20 (74.1)	25 (75.8)	45 (75)	
Washing hands after touching public object				
Correct	7 (25.9)	6 (18.2)	13 (21.7)	0.468
Incorrect	20 (74.1)	27 (81.8)	47 (78.3)	
Closing windows				
Correct	26 (96.3)	29 (87.9)	55 (91.7)	0.240
Incorrect	1 (3.7)	4 (12.1)	5 (8.3)	
Good nutrition				
Correct	19 (70.4)	19 (57.6)	38 (63.3)	0.3062
Incorrect	8 (29.6)	14 (42.4)	22 (36.7)	
Tests required to diagnose pulmonary TB				
Sputum smear microscopy				
Correct	24 (88.9)	32 (97)	56 (93.3)	0.211
Incorrect	3 (11.1)	1 (3)	4 (6.7)	
Chest x-ray				
Correct	20 (74.1)	26 (78.8)	46 (76.7)	0.667
Incorrect	7 (25.9)	7 (21.2)	14 (23.3)	
Sputum culture				
Correct	27 (100)	25 (75.8)	52 (86.7)	0.250
Incorrect	0 (0)	8 (24.2)	8 (13.3)	
Tomography				
Correct	20 (74.1)	19 (57.6)	39 (65)	0.182
Incorrect	7 (25.9)	14 (42.4)	21 (35)	
Priority actions for TB control in Health Services				
Active search for respiratory symptoms				
Correct	25 (96.3)	31 (87.9)	56 (93.3)	0.835
Incorrect	2 (3.7)	2 (12.1)	4 (6.7)	
Request sputum smear microscopy when suspecting TB				
Correct	26 (96.3)	29 (87.9)	55 (91.7)	0.240
Incorrect	1 (3.7)	4 (12.1)	5 (8.3)	
Orient patient/family on the need for the Directly Observed Treatment				
Correct	26 (96.3)	32 (97)	58 (96.7)	0.885
Incorrect	1 (3.7)	1 (3)	2 (3.3)	
Control contact				
Correct	27 (100)	31 (93.9)	58 (96.7)	0.193
Incorrect	0 (0)	2 (6.1)	2 (3.3)	
TOTAL	27 (45)	33 (55)	60 (100)	

Note: TB - Tuberculosis

DISCUSSION

This study showed the weakness of knowledge on TB among the students. Even among nursing undergraduates who reported previous contact with the topic TB, basic questions related to symptoms, diagnosis and treatment were not answered correctly.

There was no unanimity regarding the identification of the causing agent of the disease, since some students said that it was virus. This result was also found among Bangladeshi students[11] and among health professionals working in services specialized on TB treatment[4], who also presented weaknesses in knowledge regarding the causing agent of the disease, which may lead them to adopt wrong prevention measures.

Prior contact with the subject of TB was not determinant for a coherent logic regarding the relationship between the forms of transmission and ways of avoiding the disease, since some students who answered correctly to questions about the forms of transmission had incorrect answers regarding the forms of prevention.

It is common knowledge that TB is mainly transmitted through the air by aerosols. When patients who have untreated pulmonary TB, or during the first two weeks of their treatment, speak, cough or sneeze, it releases droplets that contain the bacillus and that tend to stay in the air for a few hours. These droplets, when dry, are contagious and can multiply in the alveoli. The ones that are not dry remain in the

mucosa of the upper airways, and are swallowed and inactivated by the gastric juice. Therefore, TB contamination through contact with saliva, as in kissing and sharing cutlery, is not possible[15]. Likewise, it is not possible to contract TB through handshaking, touch/contact with public items, sexual contact and insect bite.

Table 3 – Characterization of nursing students of the Federal Higher Education Institution of Mato Grosso do Sul according to knowledge about tuberculosis, Três Lagoas, Mato Grosso do Sul, Brazil, 2016

Characterization variables	With knowledge		With little knowledge		Total
	n	%	n	%	
Gender					
Female	28	87.5	26	92.9	54
Male	4	12.5	2	7.1	6
Age					
18 to 25	22	68.8	21	75	43
26 to 31	10	31.3	7	25	17
Time in UFMS					
Up to 3 years	16	50	20	71.5	36
4 to 6 years	16	50	8	28.5	24
Practical activities/internship in:					
Hospital Services?					
Yes	25	78.1	26	92.9	51
No	7	21.9	2	7.1	9
Primary Care Services?					
Yes	24	75	25	89.3	49
No	8	25	3	10.7	11
Where did they hear about TB					
Health Services	7	21.9	3	10.7	10
University	24	75	22	78.6	46
Means of communication	1	3.1	3	10.7	4
Contato com o tema TB					
Yes	16	50	11	39.3	27
No	16	50	17	60.7	33
TOTAL	32	100	28	100	60

Note: UFMS – Federal University of Mato Grosso do Sul ; TB - Tuberculosis.

Still regarding the forms of transmission and prevention of TB, it is observed that there is also misunderstanding not only among the general population (patients and non-patients), but also among health professionals, who believe that TB can be transmitted via sexual contact, contact with personal objects, cutlery and dishes; and that it should be avoided by avoiding handshakes, washing hands after touching public items, not sharing dishes and cutlery and washing clothes separately after contact with TB patient[4,6].

This fact is concerning, because the nurse who works in a health institution should provide systematized care for the individual, family and community. In the context of TB control actions, one of their interventions is to guide these people regarding transmission and environmental measures to prevent the disease, in order to interrupt the disease transmission chain and demystify misconceptions about it, avoiding stigmas and treatment dropout[21]. Furthermore, as health professionals, their lack of knowledge can lead to the lack of individual safety measures, making them more vulnerable to contamination by the TB bacilli[16,22-23].

The students, even those who reported previous contact with the subject, presented weakness in the identification of persistent cough, productive or not (with mucus and eventually with blood), fever and weight loss[19] as classic symptoms of TB. This fact is concerning given the association between lack of knowledge about TB and its symptoms and delays in its diagnosis[14,24], which leads to longer duration of the disease, aggravating the symptoms and increasing transmission. Likewise, the lack of educational actions promoted by health professionals addressing TB, its symptoms and the forms of transmission leads the patient to overlook the symptoms presented and delays their search for adequate care[14].

Regarding diagnosis, sputum smear and chest x-ray were not pointed by all students as classic methods to diagnose pulmonary TB. The National Tuberculosis Control Program(NTCP) recommends that individuals who present weight loss and cough lasting three weeks or more should be considered a probable case of pulmonary TB[19,25] and should be admitted and examined for the diagnosis. Thus, recognizing the need for diagnostic confirmation for the notification of the case and beginning of TB treatment, delay in its recognition and, as a consequence, in the request of the necessary exams for the diagnosis, leads to the continuity of bacterial transmission and the aggravation of the case. Health professional have been failing to request these exams for a large number of individuals attended in Basic Health Care[26]. This is related not only to the lack of necessary material for the exam[24], but also to weaknesses in the suspicion of the disease and in the knowledge regarding the exams that should be requested.

Similarly, to the lack of knowledge about the etiological agent of TB, students also showed weakness in knowledge regarding the type of medication used to treat the disease. The association between knowledge of the duration of TB treatment and previous contact with the subject; and also the greater proportion of correct answers regarding the priority actions for TB control among students who had previous contact with the theme "TB" corroborates the fact that experience in the assistance and follow-up of patients allows a better understanding of the subject, given the correlation between theory and practice. However, despite the importance of the association between theory and practice, it was not possible to observe a higher level of knowledge among the students who reported they had heard about TB at university and who had already participated in practical classes and internships (both in the hospital area and in Primary Care). This may suggest that most of these students have not had the opportunity to assist or participate in TB control actions, or that the way the subject was introduced to them was not enough to train them in relation to disease.

According to the National Curricular Guidelines for Nursing courses, the essential contents for the course (article 6) and the compulsory supervised internship (article 7) cover three themes: learning, learning to do, learning to be and live together. However, despite the existence of disciplines that address the subject in the curriculum of the course, the lack of knowledge on TB among nursing undergraduates revealed in this study indicates the need to increase the approach on the subject in the curriculum in order to promote "learning, learning to do and learning to be" and put into practice the skills, abilities and actions of TB prevention, promotion and protection proposed in class[27].

Studies have shown that the effectiveness of the implementation of TB control actions in health services is directly related to the level of knowledge of the professionals[16,28], who have achieved a significant improvement in knowledge, practices and attitudes in the context of training in TB based on NTCP recommendations, in a partnership with the University[29-30], in which active and discussion-based methods, presentation of films, discussions, demonstrations and so on were adopted. Even in the realities in which knowledge about TB was considered satisfactory, it is necessary to improve students' knowledge in order to increase the early detection of TB and to prevent nosocomial TB infection, especially among nursing students[13]. Thus, it is necessary to adopt these forms of training for undergraduates and health professionals, as well as to implement in-service programs within the context of the epidemiological and organizational reality of professionals.

Limitations of the study

The present knowledge assessment study used as source of data students from a single university, which has a syllabus structure that may not resemble the structure of other universities. In addition, still as limitations of the study, recall and information bias can be identified, since the data were collected from primary sources of information.

Contributions to the area of nursing

The results presented provide an overview of the training of future nurses regarding TB, which may interfere with suspicion, diagnosis and follow up of people affected by the disease. This study is expected to allow reflections about how has the teaching of neglected diseases (in particular TB) to nursing students been carried and may serve as support for the adoption of new teaching methods and for the association between teaching and service as a way to strengthen learning, leading to a qualified, safe and appropriate professional performance.

CONCLUSION

The present study identified knowledge gaps among undergraduate nursing students, regardless of whether they had prior contact with the topic of TB, performed practical activities in health services or heard about TB. Knowledge weaknesses regarding basic symptoms, prevention and diagnosis were observed, which may suggest that, for most of these students, the way the subject was introduced was not enough to train them on the disease and/or they had not had the opportunity to assist or participate in TB control actions.

The results point to the need for a teaching method that allows a better approach to the theoretical content, emphasizing the need to seek methods to experience in practice what was learned in theory.

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