ISSN-e [2675-5602]

Global Academic Nursing Journal

ORIGINAL ARTICLE

Nursing and medical students' knowledge of leprosy: students' perspectives

Conocimientos de los estudiantes sobre la lepra: discursos de los alumnos de enfermería y medicina

Saberes discentes sobre hanseníase: discursos dos estudantes de enfermagem e medicina

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Como citar este artigo:
Teotonio IF, Nascimento MBG, Fernandes MC, Barros MKS, Fernandes PKRS, Silva FAP, Silva AJS, Freitas FFQ. Nursing and medical students' knowledge of leprosy: students' perspectives. Glob Acad Nurs. 2026;7(5):e608. https://dx.doi.org/10.5935/2675-5602.20200608

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Submission: 09-13-2026
Approval: 10-30-2026

Abstract

This study aims to analyze nursing and medical students' knowledge of leprosy, considering its definition, signs, symptoms, and diagnosis. This is a descriptive study with a qualitative approach, conducted with students from a university located in the Alto Sertão region of Paraíba, Brazil. Data were organized using the Collective Subject Discourse technique. Four Central Ideas were identified: Leprosy - correct knowledge and gaps in health students' understanding; Health students' limited knowledge regarding the definition and transmission of leprosy; Emphasis on dermatological aspects, limitations in the understanding of leprosy signs and symptoms; Leprosy diagnosis, from clinical assessment as the primary approach to gaps in knowledge of complementary tests. The results revealed gaps in students' knowledge of leprosy, encompassing its definition, transmission, diagnosis, signs, and symptoms. Students' accounts reflect the need for new pedagogical strategies that promote more in-depth and contextualized teaching about leprosy throughout the educational process. The findings are expected to inform future academic initiatives and educational policies aimed at improving health professional training, thereby contributing to strengthening leprosy control and reducing the social and clinical impact of this neglected disease.

Descriptors: Leprosy; Medical Students; Nursing Students; Nursing Education; Higher Education.

Resumén

El estudio tiene como objetivo analizar los conocimientos de los estudiantes de enfermería y medicina sobre la lepra, considerando su definición, signos, síntomas y diagnóstico. Se trata de una investigación descriptiva de enfoque cualitativo, realizada con estudiantes de una universidad en la región del *sertão* de Paraíba, cuyos datos fueron organizados mediante la técnica del Discurso del Sujeto Colectivo. Fue posible identificar cuatro Ideas Centrales: Lepra: aciertos y lagunas en la comprensión de los estudiantes del área de la salud; Debilidades de los estudiantes del área de la salud respecto a la definición y transmisión de la lepra; Énfasis en los aspectos dermatológicos: limitaciones en cuanto a los signos y síntomas de la lepra; Diagnóstico de la lepra: desde la primacía de la clínica hasta la carencia de exámenes complementarios. Los resultados señalaron deficiencias en el conocimiento de los estudiantes sobre la lepra, abarcando su definición, transmisión, diagnóstico, así como los signos y síntomas de la enfermedad. Los relatos de los estudiantes reflejan la necesidad de nuevas estrategias pedagógicas que promuevan una enseñanza más profunda y contextualizada sobre la lepra durante el proceso de formación. Se espera que estos hallazgos sirvan de base para futuras iniciativas académicas y políticas educativas orientadas a mejorar la formación en el ámbito de la salud, contribuyendo al fortalecimiento del control de la lepra y a la reducción del impacto social y clínico de esta enfermedad desatendida.

Descriptores: Lepra; Estudiantes de Medicina; Estudiantes de Enfermería; Formación en Enfermería; Educación Superior.

Resumo

O estudo objetiva analisar os saberes dos discentes de enfermagem e medicina sobre Hanseníase, considerando definição, sinais, sintomas e diagnóstico. Trata-se de uma pesquisa descritiva de abordagem qualitativa, realizada com estudantes de uma Universidade do alto sertão paraibano, cujos dados foram organizados pela técnica do Discurso do Sujeito Coletivo. Foi possível identificar quatro Ideias Centrais: Hanseníase - acertos e lacunas na compreensão dos discentes da saúde; Fragilidades dos discentes da saúde acerca da definição e transmissão da Hanseníase; Ênfase nos aspectos dermatológicos - limitações nos sinais e sintomas da Hanseníase; Diagnóstico em Hanseníase - da clínica soberana à lacuna dos exames complementares. Os resultados apontaram fragilidades no conhecimento dos estudantes sobre a hanseníase, abrangendo sua definição, transmissão, diagnóstico e sinais e sintomas da doença. Os relatos dos discentes refletem a necessidade de novas estratégias pedagógicas que promovam um ensino mais aprofundado e contextualizado sobre a Hanseníase no processo de formação. Espera-se que os achados subsidiem futuras iniciativas acadêmicas e políticas educacionais voltadas ao aprimoramento da formação em saúde, contribuindo para o fortalecimento do controle da Hanseníase e para a redução do impacto social e clínico dessa doença negligenciada.

Descritores: Hanseníase; Estudantes de Medicina; Estudantes de Enfermagem; Educação em Enfermagem; Educação Superior.

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Introduction

Leprosy is classified by the World Health Organization (WHO) as one of the Neglected Tropical Diseases and, despite being curable, remains a significant global public health problem. Neglected diseases prevail under conditions of poverty and exacerbate social inequalities, as they represent a major obstacle to countries' development[1].

According to recent data, Brazil, India, and Indonesia continue to report more than 10,000 new cases per year[2]. Brazil has the second-highest number of leprosy cases worldwide, behind only India, and ranks first globally in terms of detection rate. Furthermore, the country accounts for more than 90% of diagnosed cases in the Americas[3]. In 2023, Brazil's detection rate was 10.68 new cases per 100,000 inhabitants. Paraíba, the state in which the present study was conducted, ranks 12th nationally, with 11.48 cases per 100,000 inhabitants[4].

Early diagnosis and timely treatment of leprosy are hindered by the stigma and discrimination associated with fear and lack of knowledge about the disease, as well as the inadequate training of a substantial proportion of healthcare professionals[5]. A lack of knowledge among future professionals may lead to delayed diagnoses, resulting in negative impacts on both the development of irreversible physical disabilities and the surveillance and control of the infection. Therefore, healthcare professionals require better training during undergraduate education and throughout their professional practice. It is recommended that leprosy education be included in all undergraduate health sciences programs, given the complexity and diversity of the disease's clinical manifestations[6]. The adoption of new teaching and learning strategies is essential to contribute to the development of knowledge about leprosy[7]. Academic training plays a fundamental role in developing the essential competencies of future healthcare professionals in diagnosis, treatment, and combating stigma, making it essential to reaffirm the importance of teaching about this disease in undergraduate health programs[8]. This need is supported by several studies. A study involving medical students in southern India highlights the importance of addressing the topic transversally, both in basic science courses and in supervised clinical practice[9]. Similarly, the literature emphasizes the scarcity of leprosy-related curricular content and advocates training as a strategy to optimize early diagnosis and clinical management[10].

Considering these discussions, the following research question arises: "What knowledge do nursing and medical students have about leprosy in terms of its definition, signs, symptoms, and diagnosis?".

This study is relevant because it enables a situational assessment to identify deficiencies in the teaching of this disease and contributes to the development of innovative care-educational technologies.

Thus, this study aims to analyze nursing and medical students' knowledge of leprosy regarding its definition, signs, symptoms, and diagnosis.

Methodology

This is a descriptive study with a qualitative approach, conducted with nursing and medical students at a Federal Public University located in the state of Paraíba, in northeastern Brazil.

The investigation is part of a situational assessment, a stage associated with the initial phase of the development and validation of care-educational technology aimed at improving health education on leprosy. Accordingly, the researcher enters the practical field to observe and understand the reality experienced by participants and to plan solutions based on their knowledge[11]. The situational assessment sought to identify issues or circumstances requiring solutions, considering an understanding of the setting (academic training) and the active participation of students, who were the protagonists of the research.

The inclusion criteria for the interviews were as follows: nursing and medical students regularly enrolled in supervised curricular internships (ninth- and tenth-semester nursing students) and the medical internship program (medical students), affiliated with the Federal University of Campina Grande (UFCG), Cajazeiras campus, Paraíba, Brazil. The exclusion criterion was participation, either current or previous, in extension projects and/or undergraduate research programs focused on leprosy, with the aim of reducing potential biases. Semi-structured interviews were conducted using questions designed to explore the phenomenon of interest in this study, namely, health students' knowledge of leprosy.

The interviews were conducted in person and audio-recorded between September 2024 and February 2025. They were carried out individually to ensure the privacy of interviewees and took place in three different settings: the university, the Regional Hospital, and the University Hospital in the study location.

The interviews lasted an average of eight minutes, were recorded with participants' consent, and were subsequently transcribed and analyzed. They were conducted by the interviewer after participants had read and signed the Informed Consent Form.

Approximately 10 invited participants showed reluctance or declined to participate. Some initially expressed interest in taking part in the study; however, upon learning about the topic, they decided not to proceed. Before the interviews were conducted, a relationship of trust was established between the researcher and participants through an explanation of the study's objectives and rationale. Nevertheless, the researcher had no prior relationship with the interviewees.

Theoretical saturation is achieved when no new information emerges during the interviews[12]. In the present study, saturation was reached at the 17th interview, since no new information emerged thereafter. An additional seven interviews were conducted to confirm that theoretical saturation had indeed been achieved. The Consolidated Criteria for Reporting Qualitative Research (COREQ) was used to support the credibility of the study[13].

The Collective Subject Discourse (CSD) technique was used to analyze the collected material, based on the development of Central Ideas (CIs) and their respective Key Expressions (KEs)[14].

Based on the statements obtained during the interviews, the CSDs were developed, transcribed, and linked to the pseudonyms of the participants responsible for those statements. To preserve participants' anonymity, the abbreviations Acenf [Nursing Student] and Acmed [Medical Student] were used, accompanied by a numerical sequence to replace their actual names.

This study is part of the umbrella project entitled "Development, Validation, and Evaluation of Care-Educational Technologies in the Field of Infectious Diseases." Participation and study implementation took place following registration, submission, and approval by the Research Ethics Committee (REC) of UFCG, under approval No. 6.736.169, ensuring the confidentiality and anonymity of the information collected and of all actions implemented.

Results

A total of 24 health sciences students were interviewed, including 12 nursing students and 12 medical students, all enrolled in the final semesters and undertaking curricular internships or medical clerkships. Most participants were female (14; 58%) and aged between 23 and 27 years (66.7%).

Based on the analysis of the interviews, organized according to the CSD technique, four CIs were identified: CI 01 – Leprosy: accurate knowledge and gaps in health students' understanding; CI 02 – Knowledge gaps among health students regarding the definition and transmission of leprosy; CI 03 – Emphasis on dermatological aspects: limitations in knowledge of the signs and symptoms of leprosy; and CI 04 – Leprosy diagnosis: from the primacy of clinical assessment to gaps in knowledge of complementary tests.

An analysis of the first CI, concerning students' understanding of the definition and transmission of leprosy, revealed both accurate knowledge and some gaps in their accounts. This CSD was constructed from the statements of seven participants.

CI 01. Leprosy: accurate knowledge and gaps in health students' understanding

> *"Leprosy is a dermatoneurological disease that mainly affects the skin and peripheral nerves"; "It is caused by a bacterium, Mycobacterium leprae"; "Its modes of transmission involve prolonged contact and aerosols from the upper respiratory tract"; "It is a dermatological disease that usually causes other skin changes"* (CSD01).

In the second CI, gaps in students' knowledge regarding the definition and transmission of leprosy were observed. This CSD was based on the statements of five participants: AcMed1, AcEnf9, AcMed2, AcMed4, and AcMed8.

CI 02. Knowledge gaps among health students regarding the definition and transmission of leprosy

> *"Leprosy is multibacillary, and over time it can become paucibacillary"; "When someone has leprosy with more than five lesions, a number equal to or greater than five or six, you classify it as what is called paucibacillary"; "The modes of transmission, I believe, are mainly through physical, dermatological contact"; "When I studied it, they said it could be transmitted through skin lesions; there is an infected wound, which is Virchowian, and it presents several blisters containing the virus, so the person may end up being infected after exposure"; "If it is on the skin, you always have to wear gloves and be careful. I think it is transmitted through contact with the wound secretion"* (CSD02).

The third CI highlights the limitations in students' knowledge of the signs and symptoms of leprosy. This CSD was constructed from the statements of six participants: AcEnf2, AcEnf3, AcMed1, AcMed7, AcMed10, and AcMed11.

CI 03. Emphasis on dermatological aspects: limitations in knowledge of the signs and symptoms of leprosy

> *"As far as I know, regarding the clinical signs and symptoms of leprosy, people initially report the appearance of a small spot. Therefore, the most common manifestations are skin-related, such as white or darker patches, mainly accompanied by loss of tactile, thermal, and pain sensation"; "What we most often look for in the Primary Health Care Unit are these hypochromic patches with loss of sensation"* (CSD03).

The fourth CI addresses the gaps in students' accounts regarding the methods used to diagnose leprosy. The statements of six participants were used to construct this discourse: AcEnf1, AcEnf4, AcEnf9, AcEnf11, AcEnf12, and AcMed10.

CI 04. Leprosy diagnosis: from the primacy of clinical assessment to gaps in knowledge of complementary tests

> *"Leprosy is diagnosed clinically, and in this case, I believe that clinical assessment is paramount"; "The assessment is dermatoneurological, through the clinical examination performed on the patient using monofilament tests, which are sensory tests. Each one has a different thickness and color, and we use them to assess the main points"; "The patient's physical disabilities are also assessed, along with the number of lesions and nerve thickening"; "The laboratory test we are most familiar with is slit-skin smear microscopy, but the diagnosis itself is clinical; serology is not required for confirmation"* (CSD04).

Discussion

An analysis of CSD01 shows that, although students demonstrate some accurate knowledge of the mode of transmission and understanding of leprosy, including by mentioning its neurological characteristics, their overall understanding of the disease remains superficial, as evidenced by the predominant emphasis on dermatological manifestations.

This superficial understanding may be attributed to the focus placed on the dermatological characteristics of the disease. However, leprosy is primarily neurological, initially affecting superficial and peripheral nerves and potentially resulting in significant sequelae. Therefore, it should be classified as a neurodermatological disease, highlighting the primacy of neurological involvement throughout its pathological course[15].

Studies indicate that leprosy education in undergraduate health sciences programs still has significant limitations, with little emphasis on the disease's clinical manifestations and the practical dimension frequently being neglected. An analysis of the Medical Program's Pedagogical Course Plans (PPC) at a Higher Education Institution (HEI) revealed weaknesses in the consolidation of knowledge about leprosy, resulting from a predominantly theoretical pedagogical approach and limited integration with clinical practice[16]. This may lead to the training of professionals with a substantial theoretical background but difficulties in identifying the clinical signs of the disease in healthcare settings.

Another study, conducted with health sciences students at medical schools in the state of Santa Catarina, revealed students' perception of inadequate training in leprosy. Participants also reported that the subject had been addressed sparsely and that faculty members gave it little importance compared with other topics[17]. These weaknesses contribute to students' knowledge deficits regarding the neurological manifestations of the disease.

Addressing another gap identified in this discourse, in which participants associated the etiology of leprosy with a single bacterium, studies indicate that leprosy can be caused by two specific bacterial species: Mycobacterium leprae and Mycobacterium lepromatosis. This knowledge is important for future nurses and physicians because, although these two bacterial species share several characteristics, they have sufficient genetic differences to be classified as distinct species, both of which are responsible for the development of clinical disease[18].

In CSD02, participants reported that the operational classification of the disease could change and provided confusing accounts of the characteristics of each clinical form. Furthermore, one excerpt revealed the mistaken belief that leprosy is transmitted primarily through direct physical contact with skin lesions. Leprosy has two operational classifications: Paucibacillary (PB), characterized by the presence of up to five skin lesions and a negative slit-skin smear, when available; and Multibacillary (MB), characterized by six or more lesions, involvement of more than one peripheral nerve, or a positive slit-skin smear[5].

Regarding peripheral nerve involvement, the World Health Organization (WHO) recommends the MB classification for cases involving only one nerve. However, some literature classically describes isolated involvement of a single peripheral nerve in the tuberculoid form, which is consensually recognized as PB[19].

It is important to emphasize that the bacillary load is a determining factor in the classification of leprosy, and the individual's immune response plays a crucial role in disease progression. Thus, the PB form may progress to MB if the individual does not have a sufficient immune response to contain bacterial multiplication, resulting in an increased bacillary load. However, regression from MB to PB does not occur, contrary to what some study participants stated. Once a high bacillary load has been established, treatment aims to eliminate the bacterium, not to reverse the disease classification[20].

In addition to this operational classification, there is also a classification of clinical forms, which helps identify the signs and symptoms associated with each form and identify and monitor patients at greater risk of developing inflammatory episodes and neural damage. The clinical forms are tuberculoid, Virchowian, borderline, and indeterminate[5].

Leprosy is transmitted through direct contact between people, primarily through the upper respiratory tract, and transmission is facilitated by prolonged close contact between untreated individuals with the disease and susceptible individuals. Observational studies indicate that the incubation period of leprosy is long compared with that of other bacterial infections, ranging from two to ten years or more, with an estimated average of five years[21].

Furthermore, research is underway into the possible zoonotic transmission of leprosy. A study conducted in western Pará, in the Brazilian Amazon region - where leprosy is hyperendemic among humans - identified bacterial strains circulating in both armadillos and human populations that interact with these animals. This investigation clarified the relative risk posed by these nonhuman reservoirs in disease transmission. Techniques were used to detect the presence of Mycobacterium leprae in armadillo tissue samples, in addition to whole-genome sequencing to determine the extent of infection in these wild animals[22].

As expressed in CSD03, the interviewees demonstrated knowledge of the dermatological manifestations of leprosy, although they showed limitations in identifying and understanding its neurological signs and symptoms. The neurological component of the disease must be emphasized, since leprosy is primarily a neurological disease. The main neurological symptoms include tingling, electric shock-like sensations, cramps, numbness, and pain in the upper and lower limbs; changes in palmar and plantar sensation; decreased muscle function; and edema or nodules on the face or earlobes. Peripheral nerve involvement is a central characteristic of the disease, causing pain or hypersensitivity and impairing sensory, motor, and autonomic functions. Neuropathy may vary in intensity depending on the immune resistance of the affected individual[5,23].

Furthermore, leprosy may also affect other parts of the body, such as the nose, eyes, testes, and kidneys, thus constituting a systemic disease with an impact on multiple organ systems[24].

Regarding neurological symptoms, leprosy may also present as an exclusively neural form, known as pure neural leprosy (or primary neuritic leprosy). This form is characterized by the absence of visible skin lesions and a negative slit-skin smear, and is diagnosed solely through peripheral nerve thickening associated with sensory, motor, or autonomic changes in the areas supplied by these nerves[5,25].

Therefore, health sciences students need to understand that assessing skin lesions with loss of sensation is an important step in evaluating suspected cases of leprosy. It is essential for future professionals to internalize the

primarily neurological nature of this disease, whose signs and symptoms may precede dermatological manifestations by several years. Understanding this intrinsic characteristic of leprosy will enable more accurate and earlier diagnoses, as well as timely treatment, with positive effects on patient outcomes.

Finally, in CSD04, dermatoneurological assessment is mentioned, emphasizing the importance of the clinical approach to leprosy diagnosis. Excerpts from the discourse indirectly describe steps involved in the Simplified Neurological Assessment (SNA), an examination that, according to the Clinical Protocol and Therapeutic Guidelines for Leprosy (PCDT), enables identification of the patient's degree of physical disability. The SNA comprises a detailed medical history, a thorough physical examination of the limbs and peripheral nerves, sensory testing, muscle strength assessment, and visual acuity testing[5].

However, no mention is made of complementary tests used in the diagnosis of leprosy. Auxiliary tests include Direct Smear Microscopy for Acid-Fast Bacilli (AFB), an easy-to-perform, low-cost complementary test for detecting AFB directly in slit-skin smears collected from lesions or other selected sites, such as the earlobes, elbows, and knees; histopathology, indicated when clinical assessment and smear microscopy are inconclusive, allowing analysis of the presence of the bacillus, the host's immune response, and the extent of the lesions; and the rapid immunochromatographic test for the detection of IgM antibodies against M. leprae, a low-cost, easy-to-perform test that can be conducted directly by healthcare professionals without the need for laboratory equipment and should be used in the assessment of contacts. Other tests, less frequently prescribed in Primary Health Care (PHC) settings, include peripheral nerve ultrasonography, which helps detect, for example, nerve thickening and asymmetry in anatomical areas that are difficult to palpate; electroneuromyography, which enables early identification of neural damage by assessing the extent and nature of nerve involvement; and molecular biology testing (qPCR), which amplifies specific fragments of the bacillus's DNA, allowing direct detection of M. leprae in skin or nerve biopsy samples[26,27].

Knowledge of all these complementary tests is necessary for students and future physicians and nurses, as each has its own diagnostic value, specificity, and sensitivity.

Conclusion

The study revealed gaps in nursing and medical students' knowledge of leprosy, particularly regarding the definition, modes of transmission, diagnosis, and signs and symptoms of the disease. Although some statements made by participants demonstrated accurate knowledge, important gaps in their understanding of the disease were observed. This reflects the students' own perceptions and indicates the need to address leprosy more thoroughly throughout the educational process, as evidenced by the difficulties they reported during the interviews.

Although this study did not examine academic curricula or pedagogical proposals, the data suggest that the knowledge acquired during undergraduate education remains insufficient to effectively address the disease in healthcare settings. In this context, the development of new pedagogical strategies that promote more in-depth and contextualized teaching about leprosy, such as the implementation of innovative care-educational technologies, may significantly contribute to professional training, enabling students to gain a better understanding of the disease and adopt a more humanized approach to patient care.

It is considered relevant to encourage the integration of leprosy education across different health sciences fields, promoting an interdisciplinary approach that supports the development of sound knowledge applicable to clinical practice. The adoption of active teaching methodologies, such as clinical case studies, realistic simulations, and supervised practical activities, may help students assimilate the content and better prepare them to diagnose and treat leprosy.

The findings of this study are expected to inform future academic initiatives and educational policies aimed at improving health professional training, thereby contributing to strengthening leprosy control measures and reducing the social and clinical impact of this neglected disease.

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