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Original article

Students' knowledge regarding pharmacological treatment, leprosy reactions, and contact surveillance in leprosy

Conhecimento de discentes sobre tratamento medicamentoso, reações hansênicas e vigilância de contatos na hanseníase

Conocimientos de los estudiantes sobre el tratamiento farmacológico, las reacciones a la lepra y el rastreo de contactos en casos de lepra

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Abstract

Objective: to analyze the knowledge of nursing and medical students regarding leprosy, with an emphasis on pharmacological treatment, adverse effects, leprosy reactions, and prevention and contact surveillance practices. **Method**: a descriptive, qualitative study conducted with 24 nursing and medical students from a federal public university in the Alto Sertão region of Paraíba. Data were collected between September 2024 and February 2025 via semi-structured interviews and organized using the Collective Subject Discourse technique. **Results**: four central ideas emerged regarding knowledge gaps concerning pharmacological treatment, adverse effects, leprosy reactions, and contact prevention and assessment. **Conclusion**: the students' statements reveal knowledge limitations, underscoring the need to improve educational strategies. The findings provide a basis for academic and policy initiatives, strengthening the training of future professionals and the care provided to individuals affected by this neglected disease.
Descriptors: Students, Medical; Students, Nursing; Teaching; Leprosy; Therapeutics

Resumo

hanseníase, com ênfase no tratamento medicamentoso, nos efeitos adversos, nas reações hansênicas e nas práticas de prevenção e vigilância de contatos. **Método:** estudo descritivo e qualitativo, realizado com 24 estudantes de enfermagem e medicina de uma universidade pública federal do alto sertão paraibano. Os dados foram coletados entre setembro de 2024 e fevereiro de 2025, por entrevistas semiestruturadas, e organizados pela técnica do discurso do sujeito coletivo. **Resultados:** emergiram quatro ideias centrais relacionadas às fragilidades no conhecimento sobre tratamento medicamentoso, efeitos adversos, reações hansênicas, e prevenção e avaliação de contatos. **Conclusão**: as falas revelam limitações no conhecimento dos

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estudantes, reforçando a necessidade de aprimorar estratégias educacionais. Os achados oferecem subsídios para iniciativas acadêmicas e políticas, fortalecendo a formação dos futuros profissionais e o cuidado às pessoas acometidas por essa doença negligenciada.
Descritores: Estudantes de Medicina; Estudantes de Enfermagem; Ensino; Hanseníase; Terapêutica

Resumen

Objetivo: Analizar el conocimiento de estudiantes de enfermería y medicina sobre la lepra, con énfasis en el tratamiento farmacológico, los efectos adversos, las reacciones de la lepra y las prácticas de prevención y vigilancia de contactos. **Método:** Se realizó un estudio descriptivo y cualitativo con 24 estudiantes de enfermería y medicina de una universidad pública federal en la región del Alto Sertão de Paraíba. Los datos se recopilaron entre septiembre de 2024 y febrero de 2025 mediante entrevistas semiestructuradas y se organizaron utilizando la técnica del discurso del sujeto colectivo. **Resultados:** Surgieron cuatro ideas centrales relacionadas con las deficiencias en el conocimiento sobre el tratamiento farmacológico, los efectos adversos, las reacciones de la lepra y la prevención y evaluación de contactos. **Conclusión:** Las declaraciones de los estudiantes revelan limitaciones en su conocimiento, lo que refuerza la necesidad de mejorar las estrategias educativas. Los hallazgos respaldan iniciativas académicas y políticas que fortalezcan la formación de futuros profesionales y la atención a las personas afectadas por esta enfermedad desatendida.
Descriptores: Estudiantes de Medicina; Estudiantes de Enfermería; Enseñanza; Lepra; Terapéutica

Introduction

Leprosy, classified by the World Health Organization (WHO) as a neglected tropical disease (NTD), remains a significant global public health challenge, particularly in countries marked by profound socioeconomic inequalities. Although it is a curable infectious disease, its incidence remains significant in vulnerable settings, where factors such as poverty, limited access to healthcare services, and social stigma hinder timely diagnosis and treatment.[1]

Currently, Brazil accounts for more than 90% of leprosy cases diagnosed in the Americas. While it ranks second in terms of the absolute number of cases, it has the highest disease detection rate in the world—an indicator representing the number of new cases identified per 100,000 inhabitants.[2] In 2023, the national detection rate was 10.68 new cases per 100,000 inhabitants. Paraíba (PB), the state where this study was conducted, ranks 12th nationally, with a detection rate of 11.48.[3]

From a pathophysiological perspective, leprosy primarily involves the immune system, which is responsible for the body's defense against infections. The host's immune response is a determining factor in the clinical expression of the disease.

Inadequate management—whether due to delayed diagnosis, treatment failures, or insufficient contact tracing—can lead to irreversible neurological sequelae, physical disability, underreporting of cases, and persistent social stigma, thereby perpetuating transmission and exacerbating the socioeconomic impact.[1,4]

Despite efforts to control and eliminate leprosy, various obstacles persist, including a lack of public awareness and inadequate training among some healthcare professionals.[5] Knowledge gaps among future professionals hinder the development of essential clinical competencies—particularly regarding early disease recognition, the proper management of leprosy reactions and adverse effects of multidrug therapy, and contact tracing—all of which are crucial for breaking the chain of transmission. Studies conducted in non-endemic settings also reveal knowledge gaps and misconceptions. In Italy, for instance, adolescents still associate leprosy with a “disease of the past” and are unfamiliar with aspects of its transmission and treatment.[6]

Contact surveillance—an essential pillar of leprosy control—also faces technical and cultural challenges. Research conducted in West Africa, for instance, indicates that local beliefs and fear hinder adherence to control measures and compromise early case detection.[4]

Consequently, as future health professionals, students require adequate training that fosters a systematic, cross-cutting approach to leprosy starting at the undergraduate level. Authors argue for the inclusion of this topic in the curricula of all health-related programs, given the disease's complexity and varied clinical manifestations.[7] Another study supports this need, noting a scarcity of specific curricular content on leprosy and highlighting the importance of training as a strategy to ensure early diagnosis and appropriate clinical management.[8]

Thus, it is crucial to develop and adopt new teaching-learning methodologies—including active learning approaches and educational technologies—that facilitate the acquisition of theoretical-practical knowledge and help overcome existing shortcomings in professional training.[9-10]

Given this context, the following question arises: what knowledge do nursing and medical students possess regarding leprosy—specifically concerning drug treatment and its adverse effects, leprosy reactions, and prevention and contact surveillance

practices? This research is significant as it enables a situational assessment of academic training, identifies deficiencies in how the disease is taught, and contributes to the development of innovative care-educational technologies. Therefore, the study aims to analyze the knowledge held by nursing and medical students regarding leprosy, with a focus on drug treatment, adverse effects, leprosy reactions, and prevention and contact surveillance practices.

Method

A qualitative approach was chosen because it allows for an in-depth understanding of students' perceptions, knowledge, and experiences regarding leprosy—a multifaceted phenomenon shaped by subjective, historical, and contextual factors that require interpretive analysis. The study was conducted at a federal public university located in the Alto Sertão of Paraíba, a region characterized by socioeconomic vulnerabilities and a high burden of neglected diseases, which underscores the relevance of this topic to health education.

The investigation comprised the situational diagnosis phase of a project aimed at developing a care-educational technology focused on leprosy, seeking to identify gaps in students’ knowledge to inform its development.

Participants included students enrolled in supervised curricular internships (Nursing, ninth and tenth semesters) and the medical internship program, affiliated with the Federal University of Campina Grande (UFCG), Cajazeiras campus, Paraíba, Brazil. Participants were selected through non-probability convenience sampling, considering the availability and eligibility of students enrolled in the final semesters of their respective programs and engaged in practical care settings, as they were more likely to encounter leprosy cases during their training. Students involved in leprosy-related projects were excluded to avoid prior-knowledge bias.

Semi-structured interviews were conducted. The interview guide was developed based on the literature and reviewed by peers with expertise in the topic, covering questions related to pharmacological treatment, adverse effects, leprosy reactions, and contact surveillance. A pilot test was subsequently conducted to assess the clarity and

appropriateness of the questions. The sessions were conducted by a trained researcher with no prior relationship with the participants to minimize social desirability bias.

Data collection was performed in person between September 2024 and February 2025. Individual sessions were audio-recorded with the participants' authorization. Interviews were conducted in three different settings: the university, the regional hospital, and the university hospital in the study location. Each session lasted approximately eight minutes. The recordings were subsequently transcribed verbatim and analyzed. It should be noted that the sessions were conducted by the moderator only after the participants had read and signed the Informed Consent Form (ICF).

During the data collection phase, approximately ten invited students declined to participate. Some initially expressed an interest in participating in the study; however, after learning about the topic, they decided not to proceed. To minimize resistance, before the interviews were conducted, a relationship of trust was established between the researcher and the participants through clarification of the study objectives, relevance, and procedures, while maintaining the absence of any prior relationship between the researcher and the interviewees.

Theoretical saturation is reached when no new information emerges during the interviews.[11] In the present study, saturation was reached at the 17th interview, as no new information emerged thereafter. Nevertheless, seven additional interviews were conducted to confirm the maintenance of theoretical saturation. The Consolidated Criteria for Reporting Qualitative Research (COREQ) were used to enhance the transparency of the study.[12]

The collected material was analyzed using the Collective Subject Discourse (CSD) technique, which involved identifying key expressions (KEs) and constructing their corresponding central ideas (CIs).[13] Based on the statements obtained during the interviews, CSDs were developed and associated with pseudonyms to preserve participants' anonymity. Participants were identified using the abbreviations NS (Nursing Student) and Med-S (Medical Student), followed by a sequential number.

This study was registered, submitted to, and approved by the Research Ethics Committee of UFCG (CEP/UFCG), under Opinion number 6,736,169, ensuring compliance with ethical principles as well as the confidentiality and anonymity of the information obtained.

Results

Twenty-four health science students were interviewed—12 nursing and 12 medical students—predominantly female (58%) and aged between 23 and 27 years (66.7%). This profile corresponds to students in the advanced stages of their training, who are potentially more exposed to practical experiences regarding the clinical management of leprosy.

Based on the analysis of the interviews and the organization of the Collective Subject Discourses (CSD), four central ideas were identified: CI 01 – From brief to absent: adverse effects of leprosy drug treatment; CI 02 – Obscured understanding of leprosy drug treatment; CI 03 – Lack of knowledge and misconceptions regarding leprosy reactions; CI 04 – Knowledge gaps regarding contact prevention and assessment.

An analysis of the first CI—concerning students' understanding of the adverse effects of leprosy drug treatment—reveals brief and incomplete accounts. This CSD was composed of statements from six participants: NS5, NS7, NS8, NS9, NS11, and MedS9.

CI 01 – From brief to absent: adverse effects of leprosy drug treatment

> CSD01: Regarding adverse effects, I recall weight loss; the patient may experience vomiting and nausea—gastrointestinal effects. There can be hepatic alterations—liver problems due to the volume of medication—and changes in renal function as well. Rifampicin can alter urine color, and there is clofazimine, which can darken the skin.

The second CI highlights the students' limited knowledge regarding leprosy drug treatment. This CSD was constructed based on statements from five participants: NS1, NS2, NS3, MedS3, and MedS6.

CI 02 – Limited understanding of leprosy drug treatment

CSD02: Generally, there is a specific protocol—MDT (multidrug therapy)—for the leprosy patient. This protocol is established by the Ministry of Health. The drug treatment isn't fixed; it involves four medications—the regimen includes rifampicin, isoniazid, and... I've forgotten the other two. I also recall that it lasts for several months. I believe there's a distinction: one regimen lasts nine months, while another lasts twelve. The treatment includes extra months added on in case the patient forgets to take the medication— if they go a week or a month without taking it—so there are extensions. If the individual experiences—how can I put it?—a relapse after treatment, then the phase changes. That's all I know; I'm not sure about the specifics of the medications themselves. Unfortunately, we don't cover this in university.

The third CI to be discussed highlights the students' limited knowledge regarding leprosy reactions. This Collective Subject Discourse (CSD) incorporated statements from eight participants: NS2, NS3, NS4, NS9, MedS3, NS12, MedS4, and MedS12.

CI 03 – Lack of knowledge and misconceptions regarding leprosy reactions

CSD03: I don't know what leprosy reactions are, nor the therapeutic management involved. I won't lie; I don't remember. I mean, I do have some knowledge, but regarding the management... I think... I don't know if the medication gets suspended; I don't recall. I also don't clearly remember the difference between type 1 and type 2 reactions. I don't know if it involves erythema nodosum—whether erythema is type 1 or type 2—I don't remember. I wouldn't be able to tell you about the specific treatment, though there is another medication taken. During clinical practice, there was a patient in isolation—specifically due to leprosy—under aerosol precautions. I can't explain the details; it's something that goes beyond my training. I know it always occurs after the onset of the disease.

The fourth CI reveals gaps in the students' knowledge regarding the prevention and assessment of contacts of patients diagnosed with leprosy. The CSD was composed by combining statements from eight participants: NS4, NS8, NS9, NS10, MedS4, MedS6, MedS10, and MedS12.

CI 04 – Gaps in knowledge regarding prevention and contact assessment

> CSD04: I don't remember; I really don't remember. Back when I studied this, contacts underwent a rapid test—I've forgotten the name of the test now, the one done for contacts—and I don't know if they still do it. I don't know if it's like the... the same one used for tuberculosis. For people living in the same room or sharing the same environment, sputum smear microscopy should be performed on all of them—. Regarding these individuals, a single dose—if I am not mistaken, just one "Cipro" pill—is sufficient for prevention. No, I am confusing that with tuberculosis; I do not recall exactly—I am mixing up the information. Prevention can be achieved through a proper diet or, for instance, the BCG vaccine—though I do not remember the exact indications for its administration right now.

Taken together, the four Central Ideas highlight cross-cutting weaknesses in students' knowledge regarding the clinical management of leprosy—ranging from pharmacological treatment to contact surveillance—thereby underscoring the need for more effective educational strategies throughout their health training.

Discussion

CSD01's statement correctly addresses some adverse effects of leprosy drug therapy. However, it contains gaps and inaccuracies indicating insufficient knowledge of the subject, underscoring the need to supplement the information based on scientific literature. This shortcoming aligns with studies highlighting the lack of specific leprosy-related content in curricula and limited practical training, which compromise clinical competence, therapeutic safety, and contact surveillance.[7-8]

Literature indicates that adverse effects of multidrug therapy can compromise treatment adherence and lead to treatment discontinuation, especially when not identified early by healthcare professionals.[14-17] In this context, properly recognizing these manifestations is crucial for therapeutic safety, treatment continuity, and the quality of care provided.

In 1981, the WHO introduced multidrug therapy (MDT) for leprosy, establishing a combination of three drugs: dapsone (DDS), clofazimine (CFZ), and rifampicin (RMP).[5] Healthcare professionals play a pivotal role in preventing these adverse outcomes; they must provide guidance before treatment begins, identify signs and symptoms of adverse effects early, monitor adherence, and systematically record any complications while maintaining clear communication with patients and their families.[1,4]

Resistance to treatment adherence remains one of the greatest challenges in leprosy management.[18] Limited coverage of this topic during undergraduate training can hinder the development of essential clinical skills for managing the disease—particularly in endemic regions, where early diagnosis and proper monitoring are important epidemiological control strategies. Therefore, it is essential that future professionals be adequately trained to overcome these barriers by building bonds with patients, promoting treatment adherence, encouraging self-care, and providing guidance to both patients and their families. These strategies can play a significant role in strengthening disease prevention and control interventions, as well as treatment adherence, resulting in positive transformations in society.[18]

At CSD02, study participants demonstrated limited knowledge regarding uniform multidrug therapy (U-MDT), including uncertainties about the medications used, treatment duration, and relapse scenarios. This situation reflects persistent gaps in professional training, aligning with international findings that highlight weaknesses in leprosy-related training—even in endemic countries—thereby compromising treatment adherence and appropriate case management.[19]

As previously mentioned, the therapeutic regimen adopted for leprosy treatment is U-MDT, the duration of which is determined based on the identified operational form.[1] In special situations—such as in individuals with mental disorders, substance

dependence, or severe intolerance to multiple U-MDT drugs—the use of the ROM regimen (Rifampicin, Ofloxacin, and Minocycline) may be considered.[19-20]

Some participants acknowledged the possibility of relapse following treatment. In this context, it is essential to distinguish between the concepts of relapse, therapeutic failure, and therapeutic insufficiency. Relapse is defined as the reappearance of clinical signs and symptoms of leprosy in patients discharged as cured after completing appropriate treatment with standardized therapeutic regimens.[21] Therapeutic insufficiency refers to situations where the patient, for various reasons, did not receive adequate and sufficient treatment.[22] Therapeutic failure, in turn, concerns cases where patients show no clinical improvement despite receiving MDT appropriately.[23]

A notable comment from the participants was, "We don't see this in university," reinforcing that curricular gaps during undergraduate studies limit clinical practice and the proper monitoring of patients. This scenario is not unique to Brazil. Studies conducted in India, Nepal, and Nigeria identify similar challenges, indicating the need for comprehensive continuing education strategies to strengthen clinical competencies and promote treatment adherence.[19]

Those who witness such a zest for life, hope for a better world, and a capacity to fight for and respect differences increasingly understand the value of their role in transforming reality.[24] In the context of leprosy, health education can be a crucial tool for overcoming knowledge barriers and improving clinical management, aligning with international recommendations for screning and eliminating the disease.[1] Health education aims to foster critical thinking and promote effective societal change, potentially having a positive impact on addressing diseases such as leprosy.

CSD03 reveals a concerning lack of knowledge regarding fundamental aspects of leprosy, including leprosy reactions, therapeutic management, and precautionary measures. These gaps compromise the quality of care, foster treatment abandonment, and increase the risk of disabilities and irreversible neurological sequelae.[1]

Leprosy reactions are acute inflammatory episodes involving the signs and symptoms of leprosy; they can occur before, during, or after treatment—not exclusively after the disease has run its course, as suggested by the participants.[5] These reactions are classified into two main types. Type 1 reaction, also known as

reversal reaction, occurs predominantly in patients with a preserved cell-mediated immune response. Type 2 reaction, known as erythema nodosum leprosum (ENL), affects exclusively multibacillary patients and is characterized by the appearance of painful subcutaneous nodules.[25]

The recommended clinical approach involves continuing multidrug therapy (MDT) during reaction episodes, provided the patient has not yet been discharged as cured. Prednisone is recommended for treating Type 1 reactions, whereas thalidomide is the first-choice medication for Type 2 reactions, subject to contraindications and current protocol guidelines.[5,26] The knowledge gaps identified among participants can negatively impact the care provided, particularly within Primary Health Care (PHC), which is considered strategic for disease control.

The erroneous association between leprosy and isolation can reinforce social stigma, driving patients away from health services and community life—a phenomenon observed in experiences in Brazil and other endemic countries.[1] Beyond revealing technical and scientific shortcomings, this type of perception can foster discriminatory practices and reinforce social fear surrounding the disease, thereby hindering the establishment of bonds between service users and health services.

A lack of knowledge among future professionals regarding leprosy reactions and their appropriate management can compromise the timely recognition of these episodes and lead to inappropriate clinical decisions, such as the premature discontinuation of treatment due to a misinterpretation of the condition as disease worsening. Consequently, many students may graduate without the necessary preparation to provide comprehensive care to individuals affected by leprosy.

The CSD04 reveals significant gaps in the participants' knowledge regarding prevention practices, contact surveillance, and leprosy-related interventions, including uncertainties concerning contact screening, BCG vaccination, and the use of rapid tests.

In the participants' accounts, contact prevention was mentioned only superficially, with a focus on rapid testing and BCG vaccination. Literature indicates that BCG may offer partial protection against leprosy, while rapid tests serve as important diagnostic aids, provided they are combined with appropriate clinical assessment.[27-28]

Brazil is the first country to incorporate a rapid test for detecting anti-**Mycobacterium leprae"* antibodies into its public health system as an adjunct method for leprosy control.[29] However, adopting this tool requires adequate training for health professionals to maximize its effectiveness and ensure accurate result interpretation.

Another relevant point was the lack of mention regarding neuro-dermatological assessment, which is considered essential for the early diagnosis of leprosy, the identification of neuropathic changes, and the prevention of physical disabilities.[5] Furthermore, some participants linked disease prevention to proper nutrition. Although nutritional status can influence immune response and susceptibility to infectious diseases, there is no evidence of a direct causal link between nutrition and leprosy prevention.[30]

Conceptual confusion between leprosy and tuberculosis was also observed, revealing gaps in the understanding of the clinical and epidemiological specificities of these diseases. Despite sharing some similarities, they are distinct conditions regarding clinical manifestations, modes of transmission, and therapeutic management.[6] These findings underscore the need for integrated educational approaches regarding neglected diseases within health-related academic programs, thereby fostering greater clinical confidence and reducing errors in patient care.

The findings of this study help identify specific gaps in academic training regarding the clinical management of leprosy, providing a basis for developing educational strategies and care-education technologies tailored to the identified needs.

Despite these contributions, certain limitations should be highlighted. First, the qualitative methodology based on the CSD (Collective Subject Discourse) approach may be subject to recall bias, as participants' responses rely on the recollection of past experiences and prior knowledge, which can influence the accuracy of the information obtained. Furthermore, the fact that the sample was limited to students from specific programs and a restricted geographic region may limit the generalizability of the findings to other educational, regional, and cultural contexts.

The absence of complementary quantitative data prevents the measurement of the extent and prevalence of the identified gaps, restricting the analysis to the perceptions and knowledge reported by the participants. Moreover, the study did not

directly assess student performance in actual clinical practice settings, focusing instead on self-reported knowledge and perceptions, which may not fully reflect their future professional practice. Future research is encouraged to adopt mixed-methods approaches, expand sample scope, and conduct longitudinal studies to deepen the understanding of how knowledge and competencies related to leprosy evolve throughout health professional training.

Conclusion

The findings revealed gaps in nursing and medical students' knowledge regarding essential aspects of leprosy, including pharmacological treatment, leprosy reactions, and contact surveillance. The identified deficiencies suggest limitations in academic training concerning the clinical management of the disease, underscoring the need for educational strategies that strengthen the link between theory and practice and enhance the training of future health professionals, particularly for practice within the primary health care setting.

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