Evaluation of Teaching on Leprosy by Students at a Brazilian Public Medical School

Avaliação do Ensino de Hansenologia pelos Estudantes de uma Escola Médica, Pública, Brasileira

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KEYWORDS

– Teaching on Leprosy;

– Medical Students;

– Medical Education.

ABSTRACT

Objectives: *To evaluate teaching on leprosy at a public medical school located in a metropolis in southeastern Brazil with a low leprosy prevalence rate.* ***Results:*** *An analysis performed by means of a comparative cross-sectional study on two parallel groups of students (freshmen and interns) demonstrated that most students began the medical course with some knowledge of the signs and symptoms of the disease. The interns were shown to have more theoretical knowledge and more favorable attitudes toward the disease compared to the freshmen. Most of the interns stated that the topic had been addressed during the course but that practical teaching was insufficient. Students who had had the opportunity for practical experience with patients were more confident in their ability to attend to similar cases.* ***Conclusion:*** *Although from a statistical point of view the results may seem very favorable, the same cannot be said when assessing the situation from the perspective of education and public health, since a large number of final-year medical students have not been provided with basic information on the disease.*

PALAVRAS-CHAVE

– Hanseníase, Ensino.

– Estudantes de Medicina.

– Educação Médica.

RESUMO

Objetivo: *Avaliar o ensino sobre hanseníase numa escola médica localizada em metrópole do Sudeste brasileiro com baixo coeficiente de prevalência para hanseníase.* ***Resultados:*** *Em análise realizada, utilizando um estudo comparativo entre dois grupos paralelos de estudantes do curso médico (ingressantes e internos), observou-se que a maioria dos estudantes ingressa no curso com conhecimentos sobre sinais e sintomas da doença. Os internos mostraram maior conhecimento teórico, assim como atitudes mais favoráveis em relação à doença, quando comparados aos ingressantes. A maioria dos internos afirmou que o tema foi abordado durante o curso médico, mas que o ensino prático foi insuficiente. Estudantes que tiveram experiência prática mostraram maior confiança em sua habilidade para atender casos semelhantes.* ***Conclusão:*** *Embora do ponto de vista estatístico os resultados possam parecer favoráveis, não se pode afirmar o mesmo sob a perspectiva da educação e da saúde pública, uma vez que grande número de estudantes do último ano não possui informações básicas a respeito da doença.*

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INTRODUCTION

There are different regional situations regarding the distribution of leprosy in Brazil, with areas of high endemicity and others with low prevalence and new case-detection rates. The decentralization of assistance, which is now offered at the primary health care level, was an important landmark for the increase in new case detection and large-scale MDT implementation, with the consequent reduction in treatment duration and disease prevalence.[1,2]

Maintaining the interest of health professionals in neglected diseases, including leprosy, when facing a complex prevalent nosology, which includes an increase in both chronic degenerative diseases and externally caused events,[3] has become a challenge for health services at all levels. The challenge is even greater in low-prevalence areas, where the diagnosis of new cases, though less frequent, still exists and should continue for years or even decades.[4,5]

Leprosy control is based on early diagnosis and adequate, timely treatment. The training of human resources, from undergraduate courses in the health area to continuing education, plays a fundamental role. However, the small number of cases observed in basic health units in low-prevalence areas makes it difficult to maintain expertise and to train new human resources.[6]

Indeed, how to teach about leprosy in scenarios marked by great disparities in the epidemiological situation of the disease has caused worldwide restlessness and discussions.[6-10]

The objective of the present study was to evaluate leprosy instruction in a large, public medical school located in a metropolis of southeastern Brazil with low leprosy prevalence rates.

MATERIALS AND METHODS

The study was carried out at the Medical School of the Federal University of Minas Gerais (FM/UFMG), which is located in the city of Belo Horizonte. The student body consists of approximately 1920 students divided into 12 one-semester periods, with an average of 160 students per period. The Medicine course starts with a basic cycle during the first four periods, with essentially biological and theoretical content. Following this, there is a professional cycle divided into ambulatory practice and internships. In this phase, the student begins patient clinical assessment in the presence of a teacher who supervises the student and has legal responsibility for the medical procedure. Initially, this occurs in basic outpatient units, which includes attending patients in public health services with no direct connection to the teaching hospital; the outpatient clinic is the main practice site during most of the course. In the last three periods, clinical and surgical internships are undertaken in teaching hospitals. The internship in public health is carried out in small towns and rural communities and includes public health activities and patient assistance.

Six hundred and thirty-two students in the first and in the last year of the Medicine course in 2012 were included in this study. A comparative cross-sectional design between two parallel groups was implemented: Group 1 (freshmen, first year), when the student's knowledge is similar to that of the general population; and Group 2 (interns, last year), when most of the theoretical and practical content has already been addressed.

A structured self-administered form with 16 closed questions and 3 open questions was used for Group 1; 21 closed questions and 6 open questions was used for Group 2. The questionnaire was developed by the researchers based on the manuals of the Brazilian Ministry of Health.[11] Aspects related to sociodemographics, theoretical knowledge regarding the topic, and attitudes toward the disease were included as well as questions regarding the practical instruction during the course. The questionnaire was pretested, and the necessary adjustments were made. The students were approached without prior notice and were given a brief explanation about the study and its objectives. After agreeing and providing signed informed consent, the students gave anonymous, individual, immediate answers without consulting books or other material. The study was approved by the UFMG Human Research Ethics Committee (nº 07270012.8.0000.5149).

To evaluate their theoretical knowledge and attitudes toward the disease, the two groups were compared using univariate and multivariate analyses. The following variables were used: knowledge regarding the cause, transmission, signs and symptoms, diagnosis, treatment, cure, mandatory notification, and where patients are assisted; perception about the importance of the doctor being able to diagnose and treat leprosy; attitudes toward the disease, that is, maintaining contact with a friend who has been diagnosed with leprosy and being willing to treat people with this disease. The data were stored in databanks using SPSS software.

The variables were described by their frequency distribution. Groups 1 and 2 were compared through a bivariate analysis using the asymptotic Pearson's chi-square test or the exact Pearson's chi-square test. The variables that were not a normally distributed according to Shapiro Wilk's test were analyzed with the Mann Whitney test.

A multivariate analysis using the logistic regression model was performed. All variables significant at the 0.20 level were entered into a multivariate model, which was adjusted by removing the variable with the highest p-value in a stepwise fashion until all the remaining variables were significant at the 0.05 level. The goodness of fit of the final multivariate

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logistic regression model was estimated using the Hosmer & Lemeshow test.

The answers to the open questions were categorized and grouped, and the frequency distributions are presented.

RESULTS

Of the 632 students enrolled in the two years studied, 540 (85.4%) participated in the study, with 260 (84.1%) in Group 1 and 280 (86.6%) in Group 2.

Table 1
Comparative analysis of theoretical knowledge about leprosy between groups of freshmen (Group 1) and interns (Group 2) of the UFMG Medical School in 2012

Variables	Group 1 (freshmen) n=260	Group 2 (interns) n=280	Total n=540	P value
Where you did you hear about leprosy				
Family member	69 (26.5)	67 (23.9)	136 (25.2)	0.485[1]
Medical School	58 (22.3)	248 (88.6)	306(56.7)	<0.0001[1]
Mass media	187 (71.9)	173 (61.8)	360 (66.7)	0.013[1]
Never heard of leprosy	1 (0.4)	3 (1.1)	4 (0.7)	0.625[2]
Other	118 (45.4)	22 (7.9)	140 (25.9)	<0.0001[1]
Answered correctly that transmission is by the respiratory route	92 (36.1)	181 (65.6)	273 (51.4)	<0.0001[2]
Answered correctly that the signs and symptoms are areas or skin lesions with sensory loss	234 (90.3)	278 (99.3)	512 (95.0)	<0.0001[2]
Answered correctly that diagnosis is essentially clinical	104 (4.2)	198 (71.7)	302 (56.4)	<0.0001[1]
Answered correctly that treatment is achieved with antimicrobial drugs	153 (59.1)	253 (91.0)	406 (75.6)	<0.0001[1]
Answered correctly that leprosy can be cured	205 (78.8)	247 (88.8)	452 (84.0)	<0,006[1]
Answered correctly that the disease is of mandatory notification	54 (21.0)	252 (90.0)	306 (57.0)	<0,0001[1]
Answered correctly that patients are assisted in Basic Health Units	82 (31.9)	154 (55.6)	236 (44.2)	<0,0001[1]

*1 Asymptotic Pearson's Chi-square test; 2 Exact Pearson's Chi-square test; *≤-1.96; **≥+1.96.*

The analysis of the association between the variable "Group" and sociodemographic variables showed a difference in age, with the students of the last year being older than those of the first year (p<0.0001). Regarding origin, the students in Group 2 were predominantly from Belo Horizonte, whereas those in Group 1 were predominantly from other Brazilian states (p<0.0001). No difference was found between the two groups regarding gender and income.

Table 2
Comparison of students' attitudes toward leprosy between the groups studied. UFMG, 2012

Variables	Group 1 n=260	Group 2 n=280	Total n=540	P Value
Associated Hansen's disease with leprosy n (%)				
Yes	217 (83.8)	247 (88.5)	464 (86.2)	0.110[1]
No	42 (16.2)	32 (11.5)	74 (13.8)	
How do you think a person with leprosy is treated by others n (%)				
Normally	7 (2.7)*	34 (12.2)**	41 (7.6)	
Usually avoiding physical contact	43 (16.7)	32 (11.5)	75 (14.0)	
People withdraw because it is a contagious disease	14 (5.4)	20 (7.2)	34 (6.3)	0.001[1]
People withdraw because it is a prejudiced disease	189 (73.3)	187 (67.0)	376 (70.0)	
Don't know	5 (1.9)	6 (2.2)	11 (2.0)	
If you were diagnosed with leprosy n (%)				
I would have no problem telling other people	52 (20.0)*	94 (33.9)**	146 (27.2)	
I would tell family members or people who are close to me	197 (75.8)**	166 (59.9)*	363 (67.6)	<0.0001[2]
I would hide it as much as I could, even from family members	7 (2.7)	14 (5.1)	21 (3.9)	
Other	4 (1.5)	3 (1.1)	7 (1.3)	
If your best friend told you he or she had been diagnosed with leprosy, you would n (%)				
Interact to them in the same way as before	129 (49.6)	221 (78.9)	350 (64.8)	
Avoid some situations of physical contact, closed spaces and using the same utensils	131 (50.4)	59 (21.1)	190 (35.2)	<0.0001[1]
Withdraw from him/her	0 (0.0)	0 (0.0)	0 (0.0)	
After you graduate, would you be willing to assist leprosy patients n (%)?				
Yes	258 (99.2)	247 (91.8)	505 (95.5)	<0.0001[1]
No	2 (0.8)	22 (8.2)	24 (4.5)	

*1 Asymptotic Pearson's Chi-square test; 2 Exact Pearson's Chi-square test; *≤-1.96; **≥+1.96.*

A medical student enters the course with some knowledge about leprosy obtained from different sources, especially from mass media and primary and secondary education grouped together in the variable "Other" in Table 1. For Group 2, the Medical School was the main source of information, and this group had greater theoretical knowledge compared to Group 1, as shown by all the variables analyzed (Table 1). Both groups associated Hansen's disease with leprosy. However, more favorable attitudes toward the disease were shown by the group of interns when compared to the group of freshmen (Table 2).

Table 3 presents the final model of the multivariate analysis for the variables regarding knowledge about and attitudes toward leprosy. The medical interns had a 29 times greater chance of having learned about leprosy at the Medical School, as well as a 40 times greater chance of knowing it is a disease

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Table 3
Multivariate analysis of the knowledge about and attitudes toward leprosy according to the groups studied. UFMG, 2012

Variables	Group 1	Group 2	OR	CI 95%	P Value
Heard about leprosy in Medical School					
Yes	58 (22.3)	248 (88.6)	28.93	13.62; 1.44	<0.0001
No	202 (77.7)	32 (11.4)	1		
In relation to diagnosis					
Answered correctly	104 (40.2)	198 (71.7)	2.83	1.41; 5.71	0.004
Answered incorrectly or doesn't know	155 (59.8)	78 (28.3)	1		
How is the treatment performed?					
Answered correctly	153 (59.1)	243 (91.0)	4.19	1.84; 9.55	0.001
Answered incorrectly or doesn't know	106 (40.9)	25 (9.0)	1		
Is leprosy a disease of mandatory notification?					
Answered correctly	54 (21.0)	252 (90.0)	39.88	18.17;87.55	<0.0001
Answered incorrectly or doesn't know	203 (79.0)	28 (10.0)	1		
If your best friend were diagnosed with leprosy, you would					
Maintain contact	129 (49.6)	221 (78.9)	4.72	2.31; 9.63	<0.0001
Withdraw	131 (50.4)	59 (21.1)	1		

P Value = 0.520 in the Hosmer-Lemeshow Test

of mandatory notification. It is also important to note the greater predisposition of the interns to maintaining contact with a friend who was diagnosed with leprosy.

A total of 81% of the interns stated that leprosy had been addressed during the Medicine course. The discipline Semiology (Dermatology Module) was highlighted as the most relevant in the theoretical approach (78.8%), followed by Internal Medicine and Microbiology (both 6.8%), Infectious Diseases (3.6%) and "other" disciplines, at 4.1%.

However, only 28.7% of the students observed a leprosy patient being attended by a doctor or attended one themselves. Most of these practical activities (81%) occurred in the Dermatology ambulatory (where there is a referral center for leprosy); 10.9% were in Internal Medicine outpatient clinics, at the teaching hospital or at the basic health units, with 8.1% during the Collective Health Internship.

The interns who felt more prepared to answer the basic questions of patients and contacts were those who had studied

Table 4
Perception of UFMG 2012 Medical School interns regarding their ability to diagnose, treat and answer basic questions about leprosy, according to the existence or not of theoretical teaching about the topic

Variables	Did the student study any theoretical discipline about leprosy?			Total	P Value
	Yes	No	Doesn't remember		
Do you feel prepared to diagnose leprosy?					
Yes	87 (39.4)	10 (30.3)	3 (15.8)	100 (36.6)	
No	134 (60.6)	23 (69.7)	16 (84.2)	173 (63.4)	0.089[1]
Total	221	33	19	273	
Do you feel prepared to treat leprosy?					
Yes	45 (20.4)	6 (18.2)	1 (5.3)	52	
No	176 (79.6)	27 (81.8)	18 (94.7)	221	0.272[1]
Total	221	33	19	273	
Do you feel prepared to answer basic questions about leprosy?					
Yes	123 (55.9)**	11 (33.3)*	5 (26.3)	139	
No	97 (44.1)*	22 (66.7)**	14 (73.7)	133	0.004[1]
Total	220	33	19	272	

1 Asymptotic Pearson's Chi-square test; 2 Exact Pearson's Chi-square test;
** standardized adjusted residual <-1.96;*
*** standardized adjusted residual >1.96.*

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a discipline in which leprosy was addressed (Table 4). Those who observed a leprosy patient being attended by a doctor or attended one themselves felt more prepared to diagnose and treat the disease, in addition to answering basic questions (Table 5).

Table 5
Perception of UFMG 2012 Medical School interns regarding their ability to diagnose, treat and answer basic questions about leprosy, according to the existence or not of practical instruction about the topic

Variables	Did the student participate in any practical activity regarding leprosy?			Total	P Value
	Yes	No	Does not remember		
Do you feel prepared to diagnose leprosy?					
Yes	39 (49.4)**	57 (30.3)*	4 (50.0)	100 (36.4)	
No	40 (50.6)*	131 (69.7)**	4 (50.0)	175 (63.6)	0.009[1]
Total	79	188	8	275	
Do you feel prepared to treat leprosy?					
Yes	27 (34.2)**	24 (12.8)*	1 (12.5)	52 (18.9)	
No	52 (65.8)*	164 (87.2)**	7 (87.5)	223 (81.1)	<0.0001[1]
Total	79	188	8	275	
Do you feel prepared to answer basic questions about leprosy?					
Yes	59 (75.6)**	78 (41.5)*	3 (37.5)	140 (51.1)	
No	19 (24.4)*	110 (58.5)**	5 (62.5)	134 (48.9)	<0.0001[2]
Total	78	188	8	274	

1 Asymptotic Pearson's Chi-square test; 2 Exact Pearson's Chi-square test;
**standardized adjusted residual <-1.96;*
*** standardized adjusted residual >1.96.*

The reasons the interns gave for not feeling prepared to diagnose and treat leprosy patients were related to insufficient knowledge received at the Medical School, which was reported as a lack of theoretical knowledge (36.8%), a lack of theoretical and practical knowledge (40.2%) and a lack of practical experience (23.0%).

DISCUSSION

Most of the students entered the Faculty of Medicine with knowledge about the signs and symptoms of leprosy, mainly due to formal basic education and mass media. These findings are corroborated by the literature, which shows that health and education are efficient allies.[12,13] Educational campaigns may be a good strategy to reach the population at large, quickly disseminating easily assimilated information.[14] Informative and educational activities directed at school-aged children and their teachers increase knowledge and optimize health education strategies aimed at early case detection and stigma reduction.[15,16] Thus, mass education campaigns and information about leprosy in primary and secondary education should be maintained and continuously encouraged.

The interns showed considerably higher chances of having heard about leprosy at the Medical School when compared to the freshmen; they received basic information about the topic, especially related to the diagnosis, treatment and epidemiological situation. If this situation from a statistical point of view could seem very favorable, one cannot say the same when assessed from the perspective of education and public health, since large portions of the final-year medical students do not have basic information about the disease – for example, transmission (34.4%); the clinical nature of diagnosis (29.9 %); existence of cure (11.2%) and patient care in primary health care (44.4%) – contrary to what would be expected for a disease defined as a public health problem and mandatory reporting . With regard to this last point, in particular, it is troubling to learn that 10% of the students at the end of their training did not possess this information.

The implementation of the Unified Health System in Brazil and its main directives, especially universalization of access and priority given to primary health care, have enabled the decentralization of assistance to people with leprosy. With the publication of the Health Assistance Operational Norm (NOAS/SUS 01/2001), the commitment of municipalities with integral health assistance has been regulated and expanded, and leprosy care has been defined as a strategic area.[17] However, only 55.6% of the students knew that patients should be treated in basic health units.

Despite the knowledge acquired during the Medicine course, incorrect concepts regarding transmission, aspects of diagnosis and even cure of the disease remained in a significant percentage of the students at the end of the course, indicating that the topic was insufficiently addressed. This reality made the students apprehensive about assisting patients and family members. A study with Indian medical students showed similar deficiencies in knowledge,[18] and similar findings with other students from the health area in and outside Brazil have been reported.[19–21]

Dermatology was a discipline that was important for theoretical and practical learning about leprosy; in contrast, the other disciplines showed limited input in addressing the topic. Although the participation of dermatologists in continuing education is highligted,[22,23] Opromolla, as early as 1988, emphasized the fact that leprosy is a disease with primary skin manifestations but of a systemic nature and a broad spectrum of clinical manifestations, which justifies it being taught in various modules of a medical course.[24] The high percentage of students who were unaware of the clinical aspects, epidemiology and strategies for treatment in primary health care shows that it

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is important for the topic to be addressed in disciplines of the basic cycle as well as in those of the clinical cycle. It should be noted that the topic should also be addressed in public health disciplines, as it is a disease of mandatory notification, which requires integral assistance in primary health care.[17,25]

The present trend for medical curricula to be guided by the prevalent nosology, with an emphasis on primary health care, is desirable. However, this could have a negative impact on leprosy instruction in low-prevalence areas due to the lack of patients, among other factors.[26] In locations such as that described in the present study, the possibility of contact with leprosy patients is greater in referral centers, where complicated cases predominate. This situation is not ideal for undergraduate instruction, but patients are referred to these centers by primary care doctors, and the difficulties in confirming the diagnosis represents a good learning experience. Additionally, referral centers have multidisciplinary teams, providing the student with an overview of how to approach various aspects of the disease, such as contact examination, treatment of the infection and reactions, and prevention of disabilities and rehabilitation, in addition to the need to approach the social aspects. At the medical school where the study was conducted, there is a state referral center for leprosy linked to the Dermatology Service. However, not all of the students participate in activities at this center. Thus, the practical instruction was insufficient during the course and did not include many of the students. Indeed, those who had an opportunity to participate in activities at the center were more confident in their capacity to attend a leprosy patient.

Regarding leprosy, primary health care must, more than ever, be articulated to other levels of the health system and must have the role of coordinating all efforts related to patient assistance and training of professionals.[27,28] Only with such integrated functioning will it be possible to overcome the dilemma of leprosy instruction, not allowing it to displace more prevalent diseases but also not ignoring it, which could result in increased leprosy prevalence.

Another aspect studied was the students' attitudes toward leprosy. Although the name leprosy was changed to Hansen's Disease in Brazil, most of the students, including the freshmen, associated the two terms.[29] In practice, the term "leprosy" still makes it difficult for those affected and for the community in general to address the disease, as it is associated with physical deformities.[30]

The knowledge acquired by the group of interns had a positive influence on decreasing such prejudiced attitudes. Informative activities, according to Feenstra, lead to increases in knowledge, changes in behavior and reduced stigma.[12]

Although most of the students (95.5%) reported being willing to attend leprosy patients after graduating, the percentage of those who would not do so increased at the end of the course. A lack of practical experience with complex diseases and choosing a medical specialty, with a lack of interest in anything that is not related to it, could determine this. However, less positive attitudes toward certain groups of patients and diseases during the Medicine course have been described and, in this case, could reflect a negative attitude toward the disease.[31]

Contemplation about leprosy instruction and its inclusion in the curricula of medical schools should be a continuous and mandatory exercise. Because leprosy is an important disease for public health, all doctors should graduate with basic knowledge about it. The present study pointed up students deficiency about this topic. Self-evaluation and the evaluation of services at health care facilities are essential for the identification of gaps in theoretical and practical knowledge and should guide continuing education with a joint commitment of medical schools and the health system.

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CONTRIBUTIONS

CRPA contributed substantially to the conception, design, data acquisition, analysis, data interpretation, and drafting of the article, participated jointly with the other authors in the critical revision of the intellectual content, and approved the final version for publication. MGA, MMFR and EMM contributed substantially to the conception, design, analysis, data

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CONFLICTS OF INTEREST

All authors declare that the answer to the question on competing interest form are all 'No', and therefore have nothing to declare.

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