

University students' knowledge and attitudes towards leprosy

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Abstract

Introduction: Patients with leprosy may be affected psychologically and socially by the negative attitude of society toward leprosy, caused by widespread ignorance and prevailing stereotypes surrounding the disease. This study aimed to determine the knowledge and attitudes toward leprosy among students at the University of Guadalajara.

Methodology: This descriptive cross-sectional study included 1,300 students over 18 years of age from various Thematic University Centres in Guadalajara. Students' degree subjects included the health sciences, humanities, exact sciences (*i.e.*, chemistry, physics), arts, biological-agricultural sciences, and administration. Students were randomly selected regardless of gender and all students were enrolled in either the first, second, or third year of their undergraduate studies.

Results: Overall, students showed an intermediate level of knowledge of leprosy. Results showed that 67% correctly responded that leprosy is an infectious disease, 64% knew of the presence of skin lesions, and 60% knew that a microbe causes the disease. Furthermore, 45% correctly responded that leprosy is a disease associated with poverty and 40% responded that leprosy is disabling. Only 31% stated that leprosy is curable. Negative attitudes were evident regarding the question of employing a leprosy patient (57%) and having a leprosy patient as a spouse or partner (30%).

Discussion: The results revealed that there is insufficient knowledge of and poor attitudes toward leprosy among students at the University of Guadalajara. It is necessary to improve current health education measures by using updated educational strategies to reduce the stigma of leprosy and the segregation of leprosy patients and their families.

Key words: leprosy; student survey; knowledge; attitude

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Introduction

Leprosy, also known as Hansen's disease, is caused by *Mycobacterium leprae* which affects mainly the skin and peripheral nervous system and may lead to disability. Patients may be affected psychologically and socially by the negative attitudes of society, largely due to the ignorance and stereotypes that surround this disease. These attitudes date back to biblical times when leprosy was considered to be a divine punishment [1,2].

In 2010 the World Health Organization (WHO) reported that 228,474 new cases of leprosy occur globally. In 2011, new leprosy cases were reported from 130 countries: 36 countries in Africa, 27 in the Americas, 10 in Southeast Asia, 22 in the eastern Mediterranean, and 36 from the western Pacific [3].

In 2011 Mexico registered 211 new cases, resulting in a total of 478 prevalent cases [3]. About 80% of all cases were concentrated in ten states: Jalisco, Colima, Nuevo Leon, Tamaulipas, Michoacan and Oaxaca (prevalence: 0.01-0.09/100,000 inhabitants); Sonora and Guerrero (prevalence: 0.20-0.99/100,000 inhabitants); and Sinaloa and Nayarit (prevalence: 1.0/100,000 inhabitants) [4].

The prevalence of leprosy in the state of Jalisco fell from 62 to 0.8 per 100,000 between 1990 and 2005 [5,6]. In 2011, the case detection rate was reported to be 0.01 to 0.09 per 100,000 [4].

Discrimination can result from negative attitudes combined with a lack of formal education and media campaigns aimed to counteract ignorance. According to WHO indicators, leprosy stopped being a public health problem in 1994 [7]. Jalisco is one of the ten

Table 1. Distribution of answers showing knowledge and attitude toward leprosy among university students

QUESTIONS	Frequency
	Yes n (%)
Are Hansen's disease and leprosy the same? (<i>synonym</i>)*	201 (15)
Does microbe cause the disease? (<i>microbial origin</i>)*	808 (60)
Can leprosy be cured? (<i>curable</i>)*	385 (31)
Is leprosy contagious? (<i>contagious</i>)*	856 (67)
Can leprosy cause physical disability? (<i>disabling</i>)*	518 (40)
Can a leprosy patient have skin lesions? (<i>skin lesions</i>)*	853 (64)
Is the lower socioeconomic level population more affected? (<i>associated with poverty</i>)*	572 (45)
Are there campaigns against leprosy? (<i>diffusion</i>)*	362 (28)
Would you be friends with a leprosy patient? (<i>friendship</i>)*	996 (75)
Would you relate to a friend or relative of a leprosy patient? (<i>relationship</i>)*	998 (76)
Can a leprosy patient cohabit with their family or community? (<i>companionship</i>)*	964 (70)
Would you employ a leprosy patient? (<i>employer</i>)*	737 (57)
Would you accept a leprosy patient as classmate? (<i>schoolmate</i>)*	956 (72)
Would you marry with a leprosy patient? (<i>couple</i>)*	367 (30)

*Italicized words in parentheses = key words illustrating data shown in Tables 2 and 3

states that account for 79.8% of leprosy cases in Mexico [4]; thus the aim of this study was to determine the knowledge and attitudes toward leprosy among students at the University of Guadalajara.

Methodology

We interviewed 1,300 randomly selected students who were in their first, second, or third year of undergraduate studies (five-year duration) at the Thematic University Centres. Students’ areas of study included the exact sciences (n = 200), biological-agricultural sciences (n = 200); administration sciences (n = 200); arts (n = 100); humanities sciences (n = 200); and health sciences (n = 400). All students surveyed were from the University of Guadalajara situated in the metropolitan area of Guadalajara, Jalisco, Mexico. All students were older than 18 years of age, residents of the state of Jalisco, and were selected randomly regardless of gender. The ethical principles of research were respected; *i.e.*, the aims of the study were explained to all participants and their oral consent was obtained when the survey was administered.

An oral survey of 15 items was conducted to determine participants’ knowledge of and attitudes toward leprosy. The survey included eight questions that examined the extent of their knowledge and six questions that examined attitudes (Table 1). The survey involved questions with dichotomous answer

choices similar to the survey used by Ramirez-Soltero [8] at the University of Guadalajara. Knowledge was rated excellent when 70% to 100% of the questions were answered correctly, intermediate when 40% to 69% were answered correctly, and poor when less than 40% were answered correctly. Attitudes toward leprosy were considered positive when over 50% of attitude questions were answered correctly. Four graduates with a Bachelor’s degree in Engineering (Biotechnology) from the Polytechnic University of Sinaloa were trained to manage the data prior to the implementation of the survey.

The sample size was calculated to estimate the proportion of correct and appropriate views among the study population with a maximum error of 3% and reliability of 95%.

The data were entered into an Excel spreadsheet, collated in triplicate, and transferred to SPSS (version 18; IBM, Chicago, USA) for statistical analysis. Analysis of variance of the average percentages of correct responses to survey questions among university students (grouped by area of study) was performed. The Pearson correlation coefficient between knowledge and attitude, based on the average of each University Centre, was calculated. In both cases statistical significance was accepted at the 5% level ($P \leq 0.05$).

Results

Level of knowledge

In general, the students at the University of Guadalajara showed an intermediate level of knowledge about leprosy. Overall, the questions with the highest frequency of correct responses included those which concerned leprosy as a contagious disease (67%), its association with skin lesions in patients (64%), and bacteria as the cause of leprosy (60%). In addition, 45% of students responded that leprosy is a disease associated with poverty and 40% responded that leprosy is disabling, reflecting an intermediate level of knowledge.

In contrast, a poor level of knowledge was reflected in the 31% of students who responded that leprosy is curable. In addition, only 28% responded that they were aware of the campaigns against leprosy and only 15% knew leprosy as Hansen's disease (Table 1).

Among the Thematic Centres, the students in biological-agricultural sciences showed the poorest level of knowledge (27%) while students at the other Thematic University Centres showed an intermediate level of knowledge (45%-49%) (Table 2). No statistically significant difference in level of knowledge was observed among Thematic Centres ($P = 0.496$).

Of the eight questions that assessed knowledge, only three (regarding the microbial origin of leprosy, the contagiousness of the disease, and its association with skin lesions) revealed an excellent level of knowledge, with over 80% of health sciences, humanities, exact sciences, and arts students responding correctly. In contrast, the lowest frequency of correct answers (poor knowledge) corresponded with the question concerning the equivalence of leprosy to Hansen's disease; the highest percentage of correct responses to this question, only 22%, was found among the health sciences students (Table 2).

Attitudes

A high frequency (73%) of the student population showed positive attitudes toward leprosy, reflected in the responses to four of the six questions. However, a negative attitude was reflected in the answers to questions regarding employing a leprosy patient (only 57% responded positively) and having them as a spouse or partner (only 30% responded positively) (Table 3).

Humanities students had the highest prevalence of positive attitudes (85%), followed by students in

administration sciences (73%), health sciences (63%), exact sciences (58%), arts (57%), and biological-agricultural sciences (43%) (Table 3). A statistically significant difference was found among the groups ($P = 0.033$).

We observed that the humanities students had the highest prevalence of positive attitudes (85%). For questions regarding friendship, companionship and school, 80% of health sciences students showed a positive attitude, while fewer responded positively to questions regarding employment and romantic relationships (49%). With regard to relationships, 86% of students in exact sciences and 95% of administration sciences students responded positively to questions about having leprosy patients as schoolmates. Less than 80% of students from other Thematic University Centres answered positively to the remaining questions.

Students from the health sciences, exact sciences, and arts had the lowest frequencies of positive responses to the question of whether they would employ a patient with leprosy (49%, 44% and 42%, respectively) (Table 3).

No correlation was found between knowledge and attitudes in students at the University of Guadalajara, $r = 0.626$ ($P = 0.134$) (Figure).

Discussion

This study, conducted in 2011 on students attending the University of Guadalajara – considered to be second in importance among universities in Mexico – shows a discouraging reality. The attitudes and knowledge reflected in data obtained from the students at the Thematic Centres reveal the need for a better approach for the diffusion of formal knowledge about leprosy to eliminate stigmatizing attitudes toward leprosy patients.

The results of this survey suggest that the current perception of leprosy among students is influenced by informal knowledge transmitted through oral traditions passed from generation to generation on a social, cultural or religious level in the population – a practice that has existed for centuries.

The percentage of correct responses to questions concerning knowledge about leprosy was lower than that reported by Ramirez-Soltero in 1990 [8]. This indicates that there is a notable delay in the acquisition of formal knowledge, which should be acquired either through educational programs related to the health sciences or campaigns at the state or federal level.

Table 2. Percentage of answers showing knowledge toward leprosy per Thematic University Centre and per question

QUESTION	Health Sciences (%)	Humanities Science (%)	Exact Sciences (%)	Arts Sciences (%)	Administration Sciences (%)	Biological-Agricultural Sciences (%)	Average (%)
Synonym (Hansen's Disease)	22	15	18	18	13	3	15
Microbial origin	85	25	80	82	65	23	60
Curable	17	36	22	23	36	55	31
Contagious	59	86	75	68	74	41	67
Disabling	41	24	47	44	42	42	40
Skin lesions	85	64	78	84	71	3	64
Associated with poverty	36	64	47	40	57	27	45
Diffusion	22	56	28	19	21	24	28
Average knowledge	46	46	49	47	47	27	44

Table 3. Percentage of answers showing positive attitude toward leprosy per Thematic University Centre and per question

QUESTION	Health Sciences (%)	Humanities Science (%)	Exact Sciences (%)	Arts Sciences (%)	Administration Sciences (%)	Biological-Agricultural Sciences (%)	Average (%)
Friendship	80	88	74	68	78	65	75
Relationship	80	88	86	76	73	55	76
Companionship	74	88	80	70	87	45	70
Employer	49	88	44	42	68	51	57
Schoolmate	80	88	79	70	95	22	72
Couple (Spouse/Partner)	14	72	15	17	40	21	30
Average Attitude	63	85	58	57	73	43	63

This delay largely reflects the prevalence of informal knowledge of leprosy and may influence the behaviour that can eventually lead to discrimination against patients.

In this study, the level of knowledge revealed by the average frequency of correct responses for some questions, such as those regarding whether leprosy is contagious, debilitating, or equivalent to Hansen's disease (67%, 40% and 15%, respectively), were even lower than those reported by Ramirez-Soltero in 1990 [8] (90%, 85% and 44%, respectively). The decline in the percentage of students with formal knowledge about leprosy between 1990 and the present may be partly explained by the WHO definition, which considers leprosy to be a public health problem only when the prevalence is greater than one per 10,000 inhabitants [7]. Thus, when the prevalence of leprosy in Mexico fell from 2.6 per 10,000 in 1990 to 0.71 per 10,000 in 1994, leprosy was no longer defined as a public health problem [7]. This reclassification of leprosy was followed by a reduction in the diffusion of knowledge about the disease through campaigns. In contrast, a greater percentage of students (45%) considered leprosy to be associated with poverty in 2011 compared with the percentage of students who demonstrated this knowledge 20 years ago (27%) [8]. This observation is in accordance with findings of several previous studies [9,10].

Overall, there was a higher prevalence of positive attitudes toward leprosy in students compared with the level of knowledge of the disease. This difference was reflected in the high percentage of positive responses to questions regarding socialization, friendship, companionship, school and cohabitation with leprosy

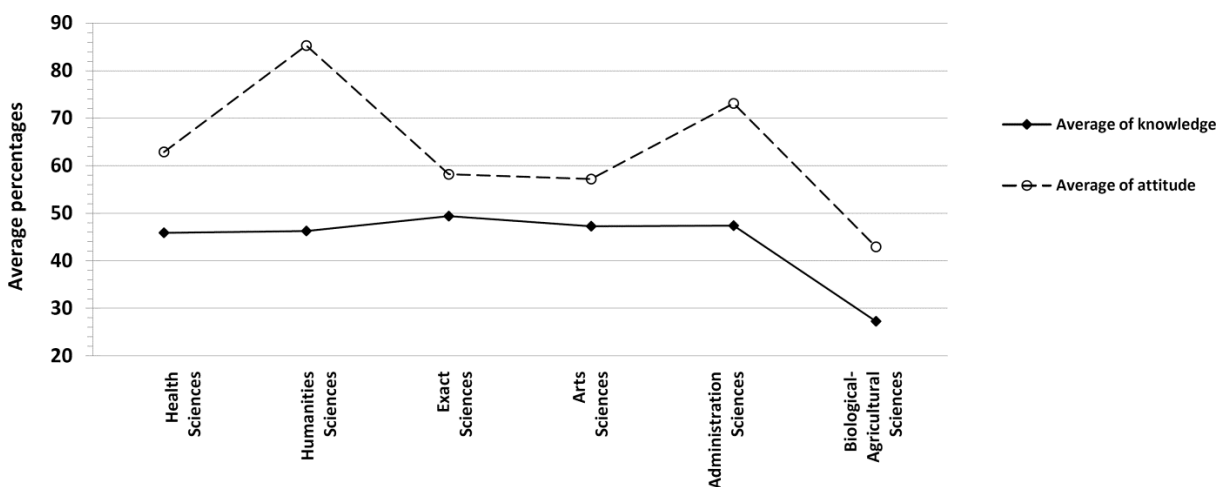
patients. Despite this positive outlook, only 30% of students said they would accept a leprosy patient as a spouse or partner, indicating that rejection of patients with leprosy is still common.

Although the majority (70%) of the students disagreed that patients with leprosy should live in isolated facilities away from society and from their families, 30% still believe that these patients should be segregated, in spite of the adoption of new laws in 2011 supporting human rights.

The Ministry of Health of the Government of Mexico developed the "Specific Program of Action 2007-2012. Leprosy", the objective of which was "to cut the transmission chain to decrease the incidence, prevalence and disability among patients, in order to advance leprosy control in Mexico through strategies and actions that adhere to the principles of equity and social justice," [4] by initiating the diffusion of educational campaigns surrounding leprosy. However, despite the permanent national campaign, most of the students surveyed demonstrated a lack of knowledge about leprosy.

We observed intermediate knowledge of and a lack of positive attitudes toward leprosy. Knowledge levels did not differ among the various Thematic University Centres (except the biological-agricultural sciences), although attitudes differed significantly ($P = 0.032$) between the humanities sciences students (with 85% positive attitudes) and those of the other centres. One would expect that the combination of the intellectual background (associated with the specialized disciplines addressed in each Thematic University Centre) and the cultural background of each student would be associated with positive attitudes toward

Figure. Percentages average of knowledge and attitudes toward leprosy per Thematic University Centres



leprosy patients. However, no significant correlation was found between level of knowledge and positive attitudes ($r = 0.626$, $P = 0.134$).

While our data show that students had an intermediate level of knowledge of and poor attitudes toward leprosy, similar studies show contrasting results. In India (2010) medical staff members were revealed to have an adequate knowledge of and a positive attitude toward leprosy [11;12], while in Pakistan (2007) inconsistencies and gaps in knowledge were shown to exist in care givers of leprosy patients [13]. In 1976 the general population of Brazil had a poor knowledge of and discriminatory attitudes toward leprosy [14]. This situation could be attributed to the fact that although the isolation of individuals affected with leprosy was compulsory by law between 1920 and 1962, in reality, confinement of patients to leprosaria continued until the 1980s [15]. In Rio de Janeiro, Brazil, (2007) leprosy outpatients commented that they experienced different attitudes and treatments depending on the cultural, socioeconomic or even linguistic differences in health-care professionals working at public health clinics [16].

Many leprosy patients suffer from feelings of fear, shame, low self-esteem, or isolation. Many feel that they are “different” and go on to develop signs of self-stigma. In addition, affected persons may start accepting the negative stereotypes surrounding their disease and may eventually develop a negative self-image [17]. It is clear that leprosy patients carry a social stigma and this is the main feature of the social impact of having leprosy [18]. Since biblical times, stigma was considered to be the consequence of sin and uncleanness [19]. Moreover, the social stigma of leprosy was supported by the fear of contagion combined with the physical manifestation of leprosy [20]. The social stigma of leprosy remained strong in the twentieth century, with western policies encouraging the confinement of people affected with leprosy within various leprosaria worldwide, leading to more fear, discrimination, and stigma [21]. Government policies are significant because they are necessary in the development and application of laws that protect the human rights of leprosy patients [22].

In Mexico, this discriminatory attitude is not exclusive to leprosy: it is also prevalent against patients with other infectious diseases such as HIV/AIDS, tuberculosis, and viral liver cirrhosis. In contrast with leprosy, however, the latter diseases are considered to be a public health priority and are actively combatted with programmes and campaigns specifically aimed at various sectors of society,

including health professionals, health education professionals, and the general public [23].

The "Specific Program of Action 2007-2012. Leprosy" aims to control leprosy in Mexico by cutting transmission and reducing the incidence and prevalence of leprosy as well as the development of disability among leprosy patients [7]. This goal has not been reached probably because of the lack of dissemination of this programme. In addition, there appears to be little motivation among various sectors of society to achieve the objectives of the programme.

Proper implementation of current educational strategies in the academic curriculum that publicize, enhance, and maintain formal knowledge of leprosy among the student population – particularly one dedicated to the study of health sciences – while also reaching the general population is crucial not only in providing knowledge but also in promoting a positive attitude toward individuals suffering from leprosy.

Conclusion

Existing programs and campaigns should promote formal knowledge and positive attitudes toward leprosy patients at all levels of society.

Health education must address leprosy in the context of its aetiology, diagnosis, early symptoms, curability, detection, prevention, general care, and social integration, thus reducing the stigma, discrimination, and segregation of leprosy patients and their families.

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