

An assessment of knowledge and attitude towards leprosy among undergraduate medical students

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Abstract

Introduction: Inappropriate knowledge and erroneous beliefs about leprosy and the disabilities caused by the disease are the main reasons for the stigma attached to the disease. The current research was embarked to determine the knowledge and attitude of the medical students towards leprosy and to compare them between freshers and outgoing students and to know the effect of undergraduate medical teaching.

Materials and Methods: This is a cross-sectional study done at a medical college in South India. The freshers and outgoing students were given a pre-contrived, pre-verified, organized questionnaire on leprosy. The results were analysed using percentage proportions, Z test and P-values.

Results: The test was answered by 66 outgoing students and 129 freshers. Outgoing students had better knowledge about leprosy being a bacterial disease, mode of transmission, cardinal signs, diagnostic test, medications used in multi-drug therapy (MDT) and cause of deformity when compared to the first years with a statistically significant difference. But the knowledge regarding few signs and symptoms of leprosy, nerve commonly affected, medical emergency in leprosy, duration of World Health Organisation (WHO) recommended paucibacillary and multibacillary MDT, deformities, vaccines and prevention of the disease was inadequate. The knowledge of the outgoing students about the present day situation of leprosy in India was superior than their counterparts. All the outgoing students had positive attitude towards leprosy when compared to first years, which was statistically significant.

Conclusion: The knowledge and attitude reflected in the data obtained from the students revealed the need for an increased emphasis on imparting adequate leprosy related knowledge.

Keywords: Leprosy, Knowledge, Attitude, Medical students, Undergraduates.

Introduction

Leprosy is a chronic infective disease caused by *Mycobacterium leprae* and the main mode of transmission is by droplet infection.¹ The sequelae of untreated leprosy are irreversible and persistent disabilities and its psychological impact on the quality of life of the patient.² Hence leprosy frequently results in enormous distinction of patients and their families.³ Global prevalence of leprosy at the end of 2016 was 171,948 with a registered prevalence rate of 0.23 per 10,000 population.⁴ India had achieved elimination of leprosy as a public health problem in December 2005.⁵ Leprosy is still prevalent in certain parts of the world, particularly India and South America.⁶ Annual New Case Detection Rate (ANCDR) was 9.98 per 1,00,000 population in 2013-14.⁷ New cases detected in India in 2016 were 135,485.⁸ Even now in the post elimination era, the burden of leprosy is high.⁹ As leprosy is a chronic disease, only by long term planning and providing reasonable care for the leprosy patients, proper control and elimination of the disease can be achieved.¹⁰ Imprecise knowledge about the disease and its management are the main causes of the widespread stigmas prevailing in diverse segments of the society. The disease related deformities and disabilities are the root cause for the disgrace and distinction of the leprosy patients even after cure.¹¹ In view of this discrimination and stigma attached to the disease, patients with leprosy set back to pursue proper medical care till they end up in deformities.¹² All these unfortunately influence their interpersonal communications, marriage, social skill and occupation, thereby affecting their quality of life.¹³ The

spread of leprosy can be reduced by early diagnosis and treatment. The incorporation of leprosy activities into primary health care system has made treatment more approachable and decreased the misconceptions attached to the disease.^{5,14} Yet, there are chances that occasionally primary health care staff may either fail to or incorrectly diagnose leprosy.¹⁵ In order to prevent this educational campaigns should be organized to impart appropriate knowledge about leprosy to the general health care staff. Since, medical students are the future doctors of the society, it is crucial that they are duly educated about the disease, so that they can outspread the knowledge and break the misconceptions of the community and they can aid in early diagnosis of leprosy to avert deformities.

The present study was undertaken to assess the knowledge and attitude of undergraduate medical students towards leprosy and to compare the knowledge and attitude amongst first year and outgoing students, so that we can understand the impact of undergraduate medical teaching and to recognise the shortcomings in their training programme.

Materials and methods

This is a comparative cross sectional study done at a tertiary care teaching hospital in South India. The participants of the study were medical students of first year (when the student's knowledge is similar to that of general population) and outgoing (when most of the theoretical and practical content has already been addressed).

Inclusion criteria: Medical students of first year and outgoing who agreed to participate in the assessment.

Exclusion criteria: Medical students of first and outgoing who were not willing to participate or those who participated in such assessments previously.

After obtaining institutional ethical committee clearance, all the students were given a pre-contrived, pre-verified organized questionnaire to complete, along with a study proforma, containing details regarding the demographic data of the students and an informed consent form. The questionnaire was drafted to contain questions to assess the knowledge and attitude of the students towards leprosy. It contained 40 questions which included 20 multiple choice questions and 20 closed questions (Table 1). 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 and immediate answers without consulting books or other materials. The time limit of the test was 30 minutes.

Statistical analysis: The results were analysed using percentage proportions and Z test. The observed difference was considered significant if p was <0.05 .

Results

The questionnaire was answered by 129 first year and 66 outgoing medical students. The demographic characteristics of the students are shown in table 2. Among them 134 (68.71%) were females and 61 (31.29%) were males. Majority (65.64%) were below 20 years and the rest (34.36%) were between 21 to 25 years of age. The foremost source of information about leprosy for majority of the students (58.97%) was school. Table 3a and 3b gives the number of students who answered the questions correctly along with the percentage proportions, Z score and P-value.

About 85.27% (110/129) of freshers knew that leprosy was a bacterial disease when compared to 100% of the outgoing students and the difference was statistically significant. For the questions about the incubation period of leprosy, mode of transmission, the typical feature of skin lesions and the cardinal signs of leprosy, 66.66% (44/66), 77.27% (51/66), 100% (66/66) and 77.27% (51/66) of the outgoing undergraduates respectively responded correctly in contrast to 44.96% (58/129), 62.01% (80/129), 58.13% (76/129) and 29.45% (38/129) of freshers respectively. The difference in the response was statistically significant.

There was no statistically significant difference observed amongst the two groups of undergraduates to the questions regarding few signs and symptoms of the leprosy, nerve most commonly thickened, nerve pain requiring immediate medical attention, WHO recommended duration of treatment in paucibacillary and multibacillary leprosy and deformities of leprosy.

Regarding the questions about tissue chiefly affected, most severe and infectious form of leprosy, diagnostic test, medications included in MDT and India being the nation with largest leprosy problem were responded affirmatively

by 98.42% (65/66), 92.42% (61/66), 74.24% (49/66), 92.42% (61/66), 81.81% (54/66) and 95.45% (63/66) of outgoing students respectively and 93.02% (120/129), 61.24% (79/129), 55.03% (71/129), 67.44% (87/129), 49.61% (64/129) and 74.41% (96/129) of first year students respectively with a statistically significant difference.

The knowledge concerning the nerve damage being the basis for the deformities in leprosy was better in outgoing students (100%) than in first year students 87.59% (113/129) with a statistically significant difference.

The test contained few questions to analyse the attitude of the undergraduates towards leprosy. Around 65.15% (43/66) of outgoing students and 28.68% (37/129) of freshers replied that they were not afraid of leprosy disease. Using the word 'leper' was not justifiable to 69.69% (46/66) of outgoing students and 42.63% (55/129) of first year students and about 81.81% (54/66) of outgoing and 57.16% (66/129) of first year undergraduates responded that there is no necessity to drive a leprosy patient to a leprosy sanatorium. A person not having leprosy marrying a leprosy patient was allowable to 72.72% (48/66) and 54.26% (70/129) of outgoing and first year students respectively. Others touching a leprosy patient was acceptable to 90.9% (60/66) of outgoing students when compared to 65.89% (85/129) of newly joined students. Around 98.48% (65/66) and 93.93% (62/66) of outgoing students are willing to treat and work with leprosy patients respectively, whereas 92.24% (119/129) and 73.64% (95/129), of the freshers respectively responded positively. There was a significant statistical difference amongst first and outgoing students for the above attitude related questions.

Statistically significant difference was not observed for certain questions like, should leprosy patients be isolated during treatment, can leprosy be passed from parents to children, is leprosy a highly infectious disease, is there any vaccine against leprosy and can leprosy can be prevented.

Only 58.13% (75/129) of first year students and about 89.39% (59/66) of the outgoing students felt the need for examining the close contacts of leprosy patients, which was statistically significant. For some questions like safety of MDT during pregnancy, availability of MDT free of charge in India, leprosy being a public health problem in India, knowledge about NLEP, leprosy is a curable and not every patient with leprosy land up in deformities were answered correctly by 71.21% (47/66), 87.87% (58/66), 93.93% (62/66), 90.9% (60/66), 95.45% (63/66) and 90.9% (60/66) of outgoing students respectively as compared to 42.63% (55/129), 38.75% (50/129)%, 68.21% (88/129), 16.27% (21/129), 85.27% (110/129) and 69.76% (90/129) of freshers respectively. The differences in responses for the above questions are statistically significant.

Discussion

Majority of the students joined the medical school with some awareness about leprosy, mainly due to schooling and electronic media. Learning activities directed at primary children increase awareness and improve health education

designs aimed at early case detection and stigma reduction. Thus, mass education campaigns and information about leprosy in schools should be maintained and continuously supported. The outgoing students showed noticeably greater contingent of having listened about leprosy at the medical school in contrast to the freshers, as they received elementary facts about epidemiology, diagnosis and management.

In present study, 96.96% of outgoing students and 84.49% of freshers knew the synonym of leprosy. In a study by Sharma et al¹⁶ 100% of outgoing, 78% of third year and 88% of second year undergraduates were cognizant of it. In an identical research by Leena et al¹ among medical undergraduates 98.68% of outgoing students and 62.76% of freshmen knew the right answer. These are in accordance with our study, while in a study by Graciano-Machuca et al¹⁷ in Mexico, only 15% of university students answered correctly.

In the present study, all the outgoing students and 85.27% of freshers were aware that leprosy is a bacterial infection. In an identical study by Leena et al¹ all the outgoing students and 74.46% of freshers answered correctly. Abhishek Sharma et al¹⁶ reported that all the final years, all the third years and 92% of second year medical students answered correctly whereas in the study by Graciano-Machuca et al¹⁷, only 60% of university students gave the right answer about the cause of the disease. About 77.27% of outgoing students and 62.01% of freshers had knowledge about the transmission of leprosy in our study. In the study from Brazil by Alves et al¹⁸ 65.6% of interns and 36.1% of freshers gave right answer in accordance with our study. In the study of Leena et al¹ both outgoing students (39.47%) and freshers (38.15%) had poor knowledge regarding the mode of transmission. In the research by Meena Jain et al¹⁹ among dental students, only 34.9% answered correctly. Based on the above statistics, it can be said that our medical undergraduates were well aware of the synonym of leprosy, etiology and transmission when compared to non-medical students and among our undergraduates, outgoing had better knowledge than freshers.

The typical feature of absence of sensations over the affected skin in leprosy was known to all the outgoing students. The cardinal signs and tissue principally involved in leprosy was known to 77.27% and 98.42% of seniors respectively in our study. The key feature of cutaneous lesions of leprosy was recognised by 99.30% of interns in a study by Alves et al.¹⁸ The fundamental signs of leprosy were familiar to 77% of outgoing students and 50% of interns in the studies by Sharma et al¹⁶ and by Giri et al²⁰ respectively. In a research by Jain et al¹⁹ 74.90% of dental students knew the chiefly affected tissue in leprosy. The awareness of our outgoing students about the clinical features of leprosy was similar to the above mentioned studies.

The diagnostic test in leprosy and medications included in multidrug therapy were answered by 92.42% and 81.81% of seniors as compared to 67.44% and 49.61% of freshers

respectively in our research. In comparison, Sharma et al¹⁶ reported that 96% and 100% of outgoing students knew the diagnostic test and constituents of multidrug therapy respectively which was similar to our results. However, the diagnostic test was known to only 63.40% of dental students in an analysis by Jain et al¹⁹ which was lower than the above mentioned studies.

About 95.45% of seniors identified that the nation with largest leprosy problem was India, 87.87% knew that the medications were available free of charge to leprosy patients and 93.93% were aware that leprosy is a public health problem in India in our research. National leprosy elimination program was known to 90.90% of our outgoing students as compared to 29.65% of dental students in a research by Jain et al.¹⁹ The public health related knowledge of our outgoing students was relatively better.

The etiology of deformity in leprosy was known known to all the seniors in the current research. The awareness that not all leprosy patients land up in deformities was present in 90.90% of seniors in our study. In the current research, 95.45% of outgoing students were aware that leprosy was a curable disease as compared to 88.85% of interns, 74.90% of dental students and 31% of university students in studies by Alves et al,¹⁸ Jain et al¹⁹ and Graciano-Machuca et al¹⁷ respectively.

Despite the knowledge acquired during the medicine course, erroneous concepts regarding few signs and symptoms, nerve commonly affected, medical emergency in leprosy, durations of PBMDT and MBMDT, isolation during treatment, deformities, vaccines and prevention of the disease remained in a significant percentage of the students at the end of the course, indicating that the topic was inadequately addressed. An identical research by Giri et al²⁰ on medical students showed similar deficiencies in knowledge.

Another aspect studied was the students attitude towards leprosy. In the current research, seniors had better attitude when compared to freshers, which was statistically significant. In the present research, questions such as willingness to treat a leprosy patient, sharing work place with leprosy patient and not having apprehension of leprosy were responded affirmatively by 98.48%, 93.93% and 65.15% of seniors respectively, whereas only 69.41%, 58.3% and 45.4% of dental students respectively provided affirmative response in a study by Jain et al.¹⁹ The above result showed a finer attitude of outgoing medical students than dental students.

Though the term leprosy was changed to Hansen's disease, most of the students, including the freshers, correlated the two terms. 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. The knowledge acquired by the group of outgoing had a positive influence on decreasing such prejudiced attitudes.

Barring for some important issues like vaccines, seniors definitely had a better overall knowledge about leprosy compared to their counterparts in the first year. The

awareness and attitude of our seniors was fairly good. Still, there is a need for well-coordinated, specially addressed

informational activities in leprosy for medical students for a better diffusion of formal knowledge about leprosy.

Table 1: Study questionnaire.

1. Leprosy is also known as:
 - a) Huntington's disease b) Horton's disease c) Hansen's disease d) Hartnup disease
2. Which of the following is the cause of leprosy?
 - a) Sinful behaviour b) Bacteria c) Curse d) Insect bite
3. The duration between acquiring infection and manifestation of disease in leprosy is usually:
 - a) 1-5 years b) 5-10 years c) 1-10 years d) 11-20 years
4. The usual mode of transmission of leprosy is by:
 - a) Touch b) Food c) Droplet infection d) Water
5. The characteristic hallmark of the cutaneous lesions of leprosy is:
 - a) Itching
 - b) Loss of sensation
 - c) Pain
 - d) Hyperpigmentation
6. Which among the following is not a cardinal sign of leprosy?
 - a) Thickening of nerves b) Loss of sensation
 - c) Presence of bacilli in skin smear d) Claw hand
7. One of the following is not a feature of leprosy:
 - a) Edema of feet b) Painless ulcers over extremities
 - c) Prickling sensation of hands and feet d) Darkening of face
8. The chiefly involved structure in leprosy is:
 - a) Nerves b) Heart c) Brain d) Eyes
9. Which of the following is the severe type of leprosy?
 - a) Borderline tuberculoid b) Pure neuritic c) Lepromatous d) Borderline lepromatous
10. The most frequently afflicted nerve in leprosy is:
 - a) Median nerve b) Common peroneal nerve c) Ulnar nerve d) Greater auricular nerve
11. One of the following condition is a medical emergency in leprosy:
 - a) Sudden loss of hair
 - b) Intense pruritus
 - c) Pain in the nerve
 - d) Burning in the feet
12. Which among the following types of leprosy is most contagious ?
 - a) Tuberculoid b) Pure neuritic c) Lepromatous d) Borderline tuberculoid
13. The most commonly employed diagnostic test in leprosy is:
 - a) Complete blood count b) Slit skin smear c) Nerve biopsy d) Nasal smear
14. One of the following medication is not a constituent of multidrug therapy of leprosy:
 - a) Dapsone b) Minocycline c) Clofazamine d) Rifampicin
15. According to World Health Organization, the period of paucibacillary multidrug therapy regimen is:
 - a) 3 months b) 6 months c) 9 months d) 12 months
16. According to World Health Organization, the period of multibacillary multidrug therapy regimen is:
 - a) 6 months b) 12 months c) 18 months d) 24 months
17. The nation with highest leprosy problem is:
 - a) Nigeria b) India c) Indonesia d) Brazil
18. Deformities in leprosy occur mainly due to damage of:
 - a) Liver b) Nerve
 - c) Brain d) Kidney
19. Which of the following is not a deformity of leprosy?
 - a) Loss of eyebrows b) Claw hand c) Facial palsy d) Drooping fingers
20. Leprosy patients need not be confined because:
 - a) Leprosy is not communicable
 - b) Leprosy is not communicable once medications are initiated
 - c) Leprosy will not be transmitted by contact
 - d) None of the above
21. Are you scared of leprosy?
 - a) Yes b) No

22. Is it all right to use the term *Leper*?
a) Yes b) No
23. Is it ok to send a leprosy patient to leprosy sanatorium?
a) Yes b) No
24. Is it fine for an individual without leprosy to marry a leprosy patient?
a) Yes b) No
25. Is it ok if normal people touch leprosy patient?
a) Yes b) No
26. Is it acceptable for you to treat a leprosy patient?
a) Yes b) No
27. Are you willing to share workplace with leprosy patients?
a) Yes b) No
28. Is it necessary to confine leprosy patients during treatment?
a) Yes b) No
29. Should the close contacts of leprosy patients be examined?
a) Yes b) No
30. Are there various forms of leprosy?
a) Yes b) No
31. Is leprosy transmittable from parents to children?
a) Yes b) No
32. Is multidrug therapy safe during pregnancy and lactation for mother and baby?
a) Yes b) No
33. Are the leprosy medications available free of charge to the patients in India?
a) Yes b) No
34. Do you think that leprosy is a highly infectious disease?
a) Yes b) No
35. Is there any vaccine available against leprosy?
a) Yes b) No
36. Is leprosy a public health problem in India?
a) Yes b) No
37. Are you aware of National Leprosy Eradication Programme?
a) Yes b) No
38. Is leprosy a curable disease?
a) Yes b) No
39. Do all patients with leprosy land up in deformities?
a) Yes b) No
40. Can leprosy be prevented?
a) Yes b) No

Table 2: Distribution of medical students according to demographic characteristics.

Variable	Frequency (N)	Percentage (%)
Gender:		
Female	134	68.71
Male	61	31.29
Age groups:		
<20 years	128	65.64
21-25 years	67	34.36
Year of medical training:		
1st year	129	66.15
Outgoing	66	33.84
Source of information:		
School	115	58.97
Friends/family	33	16.92
Doctor	62	31.79
Media	55	28.2
Other health workers	19	9.74

Table 3a: Assesment of knowledge, attitude about leprosy among the study population.

Questions	final year students		First year students		z score	P value
	n=66		n=129			
	correct	correct%	correct	correct%		
1	64	96.96	109	84.49	3.05	0.00111
2	66	100	110	85.27	4.35	0.00001
3	44	66.66	58	44.96	2.24	0.01229
4	51	77.27	80	62.01	1.909	0.02812
5	66	100	76	58.129	7.39	0.00000
6	51	77.27	38	29.45	5.06	0.00000
7	28	42.42	45	34.88	0.64	0.26027
8	65	98.42	120	93.02	1.93	0.02661
9	61	92.42	79	61.24	4.83	0.00000
10	37	56.06	80	62.01	-0.607	0.72814
11	44	66.66	88	68.21	-0.17	0.57095
12	49	74.24	71	55.03	2.23	0.01271
13	61	92.42	87	67.44	4.12	0.00002
14	54	81.81	64	49.61	3.94	0.00004
15	18	27.27	40	31	-0.29	0.61469
16	47	71.21	75	58.13	1.49	0.06685
17	63	95.45	96	74.41	4.06	0.00002
18	66	100	113	87.59	4.001	0.00003
19	22	33.33	20	15.5	1.38	0.08351
20	26	39.39	23	17.8	1.73	0.04166

Table 3b: Assesment of knowledge, attitude about leprosy among the study population.

Questions	Final year students		First year students		z score	P value
	n=66		n=129			
	correct	correct%	correct	correct%		
21	43	65.15	37	28.68	3.05	0.00023
22	46	69.69	55	42.63	2.84	0.00221
23	54	81.81	66	51.16	3.78	0.00008
24	48	72.72	70	54.26	2.106	0.01757
25	60	90.9	85	65.89	3.94	0.00004
26	65	98.48	119	92.24	2.16	0.01525
27	62	93.93	95	73.64	3.72	0.00010
28	48	72.72	78	60.46	1.44	0.07422
29	59	89.39	75	58.13	4.48	0.00000
30	65	98.48	113	87.59	3.15	0.00081
31	49	74.24	104	80.62	-0.86	0.80724
32	47	71.21	55	42.63	3.04	0.00116
33	58	87.87	50	38.75	6.05	0.00000
34	39	59.09	84	65.11	-0.63	0.73827
35	11	16.66	93	72.09	-4.55	1.00000
36	62	93.93	88	68.21	4.42	0.00000
37	60	90.9	21	16.27	8.41	0.00000
38	63	95.45	110	85.27	2.37	0.00868
39	60	90.9	90	69.76	3.46	0.00027
40	64	96.96	124	96.12	0.38	0.38040

Conclusion

In medical schools such as that depicted in the present research, the contingent of contact with leprosy patients is higher where complicated cases predominate and have multispeciality teams, providing the students 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. Still, the present study pointed out few deficiencies about this topic in our students which emphasizes the need for the topic to be addressed in disciplines of basic as well as clinical sciences.

Leprosy instruction and its inclusion in the curricula of medical schools should be a continuous and mandatory exercise. As leprosy is an important disease for public health, all doctors should graduate with basic knowledge about it. A joint commitment of medical schools and the national health programmes is essential for the identification of gaps in theoretical and practical knowledge.

Appropriate medical teaching should capacitate the medical students in terms of proficiency of subject and also the sensibility to treat the patients with dedication and empathy.

Conflict of Interest: None.

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