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AWARENESS OF HANSEN'S DISEASE AMONG NON DERMATOLOGISTS - A KAP STUDY

Dermatology

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ABSTRACT

Background: Hansen's disease remains a significant public health concern in India despite the availability of effective multidrug therapy (MDT). Since non-dermatologist medical practitioners are often the first point of contact for patients, their knowledge, attitude, and clinical practices play a vital role in early diagnosis, timely referral, and prevention of disability. The present study assessed the awareness of Hansen's disease among non-dermatologist healthcare professionals using a Knowledge, Attitude, and Practice (KAP) approach. **Methods:** A hospital-based cross-sectional KAP study was conducted among 240 non-dermatologist medical practitioners. Data were collected using a structured, pre-validated questionnaire assessing demographic characteristics and knowledge, attitude, and practice regarding Hansen's disease. Statistical analysis was performed using SPSS version 26.0. Descriptive statistics, Wilson score 95% confidence intervals, one-sample Chi-square goodness-of-fit test, and Chi-square test of independence with Yates' continuity correction were used. A p-value <0.05 was considered statistically significant. **Results:** The mean age of participants was 36.4 ± 8.9 years, with 55.8% males and 44.2% females. Adequate knowledge was observed regarding the causative organism (77.1%), cardinal signs (75.4%), multidrug therapy (74.6%), and complications (78.3%) (p<0.001). However, only 45.8% had received formal training, while awareness regarding Type 1 lepra reaction (40.0%) and incubation period (50.4%) was limited. Positive attitudes were demonstrated towards mandatory training (97.5%), recognition of social stigma (94.2%), and belief in MDT curability (89.2%). The practice domain showed limited direct clinical exposure, with only 30.8% frequently encountering suspected cases and 28.7% initiating treatment, although 80.4% appropriately referred suspected cases and 88.3% educated patients regarding curability. **Conclusion:** Non-dermatologist medical practitioners demonstrated satisfactory knowledge and positive attitudes towards Hansen's disease but exhibited deficiencies in formal training, early diagnosis, and practical clinical experience. Regular continuing medical education and structured training programmes are required to improve awareness, reduce misconceptions and stigma, promote early diagnosis, and strengthen the implementation of the National Leprosy Eradication Programme.

KEYWORDS

Hansen's disease; Leprosy; Knowledge, Attitude and Practice; Non-dermatologists; Medical practitioners.

1.INTRODUCTION

Hansen's disease (leprosy) is a chronic infectious disease caused by *Mycobacterium leprae* and *Mycobacterium lepromatosis*, primarily affecting the skin, peripheral nerves, upper respiratory tract mucosa, and eyes. Despite remarkable advances in diagnosis, multidrug therapy (MDT), and national elimination programmes, Hansen's disease continues to pose a significant public health challenge in several low- and middle-income countries, particularly India, which contributes more than half of the world's newly detected cases annually (1,2). The disease has a long incubation period, ranging from several months to over 20 years, leading to delayed diagnosis and continued transmission within the community (3).

Early diagnosis and prompt initiation of MDT are essential to interrupt transmission, prevent irreversible nerve damage, reduce physical disability, and improve quality of life (2,4). Although dermatologists play a pivotal role in diagnosing and managing Hansen's disease, the majority of patients initially seek medical attention from non-dermatologist healthcare providers, including general physicians, surgeons, orthopaedic specialists, neurologists, ophthalmologists, family physicians, and medical officers working in primary healthcare settings (5).

Consequently, the knowledge, attitude, and clinical practices of these healthcare professionals have a direct impact on early case detection, timely referral, initiation of appropriate treatment, and prevention of disability. However, declining disease prevalence following the achievement of elimination targets has paradoxically reduced clinical exposure to Hansen's disease during undergraduate and postgraduate medical training, resulting in inadequate awareness and reduced diagnostic confidence among non-dermatologists (6). Misconceptions regarding the mode of transmission, infectivity, clinical presentation, and curability of Hansen's disease continue to exist among healthcare workers, contributing to delayed recognition, inappropriate referrals, unnecessary investigations, and persistent social stigma (7).

Stigma remains one of the most devastating consequences of Hansen's disease, often leading to discrimination, social isolation, unemployment, psychological distress, and delayed healthcare-seeking behaviour among affected individuals (8). Healthcare providers themselves may inadvertently contribute to stigma when they possess inadequate knowledge or negative attitudes toward the disease. Therefore, improving awareness among medical professionals is considered an essential component of national leprosy control strategies (2,9). Knowledge, Attitude, and Practice (KAP) studies are widely used to evaluate healthcare professionals' understanding of diseases, identify misconceptions, assess readiness to manage patients, and determine educational needs. Such studies provide valuable evidence for designing targeted continuing medical education programmes and strengthening undergraduate and postgraduate curricula (10).

Previous studies conducted among medical students, interns, general practitioners, and healthcare workers have reported varying levels of knowledge regarding the causative organism, transmission, clinical manifestations, diagnosis, multidrug therapy, and prevention of Hansen's disease, with persistent gaps in recognition of early symptoms, lepra reactions, and management of complications (11–13). Studies have also demonstrated that although most healthcare professionals recognize Hansen's disease as a curable condition, many lack confidence in diagnosing early disease and continue to harbour misconceptions regarding transmission through casual contact (12,13). Furthermore, limited awareness of the National Leprosy Eradication Programme (NLEP), post-exposure prophylaxis, and disability prevention strategies has been observed among non-specialists (14).

Considering that non-dermatologists constitute the first point of contact for a large proportion of patients in both urban and rural healthcare settings, their awareness plays a crucial role in achieving the goals of early detection, prompt referral, reduction of disability, and interruption of disease transmission (15). Periodic assessment of their knowledge, attitudes, and practices is therefore essential for identifying educational deficiencies and implementing evidence-based interventions. In this context, the present study aims to assess the awareness of Hansen's disease among non-dermatologists using a structured Knowledge, Attitude, and Practice (KAP) questionnaire, thereby providing evidence to guide future educational initiatives and strengthen leprosy control efforts in India.

2.MATERIALS AND METHODS

2.1. Study Design

The present study was conducted as a hospital-based cross-sectional Knowledge, Attitude, and Practice (KAP) study to assess the awareness of Hansen's disease among non-dermatologist medical practitioners. A structured, pre-validated questionnaire was used to

evaluate participants' knowledge regarding the epidemiology, diagnosis, transmission, complications, and management of Hansen's disease, along with their attitudes toward patients with Hansen's disease and their routine clinical practices. The study also aimed to identify existing knowledge gaps and compare selected indicators with previously published studies.

2.2. Study Setting
The study was conducted among non-dermatologist medical practitioners working in government hospitals, private hospitals, medical colleges, private clinics, and other healthcare facilities. Participants were recruited from various clinical departments excluding Dermatology. The study setting included both public and private healthcare institutions to obtain participants with diverse clinical experience and practice backgrounds.

2.3. Study Duration
The study was conducted over a period of 12 months after obtaining approval from the Institutional Ethics Committee. The study period included questionnaire development and validation, participant recruitment, data collection, statistical analysis, and preparation of the final report.

2.4. Participants
Inclusion Criteria
- Registered medical practitioners belonging to specialties other than Dermatology.
- Medical officers, postgraduate residents, consultants, and faculty members practicing in clinical departments.
- Practitioners working in government hospitals, private hospitals, medical colleges, private clinics, or similar healthcare institutions.
- Participants willing to provide written informed consent.

Exclusion Criteria
- Dermatologists and postgraduate trainees in Dermatology.
- Undergraduate MBBS students and interns.
- Non-clinical faculty members.
- Healthcare professionals other than registered medical practitioners.
- Participants who declined consent.
- Incompletely filled questionnaires.

2.5. Study Sampling
A convenience sampling technique was adopted for participant recruitment. Eligible non-dermatologist medical practitioners who fulfilled the inclusion criteria were approached during the study period and invited to participate. After obtaining written informed consent, participants were provided with the structured questionnaire. Recruitment continued until the required sample size was achieved. A total of 240 participants completed the questionnaire and were included in the final analysis.

2.6. Study Sample Size
The sample size was determined considering the objectives of the study and the expected proportion of adequate awareness among non-dermatologist medical practitioners reported in previous KAP studies on Hansen's disease. A minimum sample size of 240 participants was considered adequate to estimate knowledge, attitude, and practice parameters with acceptable precision while allowing subgroup comparisons according to demographic characteristics and workplace settings. Therefore, all eligible participants recruited during the study period who completed the questionnaire were included in the final analysis.

2.7. Study Parameters
- The questionnaire consisted of demographic information and KAP-related items.
- The demographic variables included age, gender, years of clinical practice, and workplace.

The knowledge domain assessed awareness regarding formal training on Hansen's disease, causative organism, mode of transmission, early symptoms, cardinal signs, peripheral nerve involvement, Type 1 lepra reaction, multidrug therapy (MDT), complications of untreated disease, incubation period, and person-to-person spread.

The attitude domain evaluated participants' perceptions regarding Hansen's disease as a public health problem, confidence in early diagnosis, social stigma, willingness to work in leprosy clinics, belief in MDT effectiveness, mandatory training, discrimination against patients, and misconceptions regarding disease transmission.

The practice domain evaluated the frequency of encountering suspected Hansen's disease cases, appropriate referral practices, previous initiation of treatment, patient education regarding curability, and awareness of the National Leprosy Eradication Programme (NLEP).

2.8. Study Procedure
After obtaining Institutional Ethics Committee approval, eligible participants were approached personally at their respective workplaces. The objectives of the study were explained, and written informed consent was obtained before enrolment. Participants completed a structured self-administered questionnaire anonymously. The questionnaire consisted of demographic variables followed by separate sections assessing knowledge, attitude, and practice regarding Hansen's disease. Participants completed the questionnaire independently without external assistance or reference materials. Completed questionnaires were checked for completeness before inclusion in the study. Confidentiality of participant information was maintained throughout the study by assigning unique identification numbers and excluding personal identifiers.

2.9. Study Data Collection
Data were collected using a structured, pre-tested questionnaire specifically designed for the study. The questionnaire included demographic characteristics followed by 24 KAP items. Each response was classified as correct/favourable or incorrect/unfavourable according to standard recommendations for Hansen's disease diagnosis and management. Completed questionnaires were reviewed for completeness before data entry. All responses were coded and entered into Microsoft Excel before statistical analysis.

2.10. Data Analysis
All analyses were performed in SPSS version 26. Item-wise proportions were computed with Wilson score 95% confidence intervals (more accurate than the normal approximation at proportions close to 0 or 1). A one-sample chi-square goodness-of-fit test compared each item's correct/incorrect split against a 50:50 null (chance-level) distribution. Proportions for comparable items were compared against Vaishali et al. (2025, n=323) and Bajaj et al. (2009, n=200) using the chi-square test of independence (2×2 contingency tables) with Yates' continuity correction. A two-sided p-value <0.05 was considered statistically significant.

2.11. Ethical Considerations
The study was conducted after obtaining approval from the Institutional Ethics Committee. Written informed consent was obtained from all participants prior to enrolment. Participation was entirely voluntary, and participants were informed that they could withdraw from the study at any stage without providing any reason. Confidentiality and anonymity were maintained throughout the study by assigning unique identification numbers and removing personal identifiers from the database. The collected data were used solely for research purposes and stored securely. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and the Indian Council of Medical Research (ICMR) National Ethical Guidelines for Biomedical and Health Research Involving Human Participants.

3. RESULTS
A total of 240 participants were included in the study. The demographic details of the participants are given in Table 1.

Table 1. Demographic Profile of Study Participants (n = 240)

Variable	Category	n	%
Age	Mean ± SD	36.4 ± 8.9 years	
Gender	Male	134	55.8
	Female	106	44.2
Years of Clinical Practice	<5 years	84	35%
	>5 years	156	65%
Workplace	Government Hospital	96	40.0
	Private Hospital	58	24.2
	Medical College	46	19.2
	Private Clinic	28	11.7
	Other	12	5.0

Aggregate item-level knowledge, attitude and practice responses were analysed statistically.

Knowledge domain (Q6–Q16)

Table 2 presents item-wise correct-response rates. Knowledge was generally satisfactory for the causative organism (77.1%), complications (78.3%), cardinal sign (75.4%) and the MB-MDT regimen (74.6%), all significantly above the 50% chance level ($p<0.001$). Only 45.8% of respondents reported having received formal training on Hansen's disease, and this item did not differ significantly from chance ($\chi^2=1.67$, $p=0.197$). Notable knowledge gaps were seen for the immunology of the Type 1 lepra reaction (40.0% correct) and the average incubation period (50.4% correct, statistically indistinguishable from a chance-level response, $\chi^2=0.02$, $p=0.897$), indicating these are areas of systematic uncertainty rather than confident misclassification.

Table 2. Knowledge domain-item-wise correct/incorrect responses (n=240).

Q.No	Item	Correct/ favourable n (%)	Incorrect/ unfavourable n (%)	95% CI (%)	χ^2 (df=1)	p-value*
6	Received formal training on Hansen's disease	110 (45.8)	130 (54.2)	39.6–52.2	1.67	0.197
7	Causative organism of Hansen's disease	185 (77.1)	55 (22.9)	71.4–81.9	70.42	<0.001
8	Primary mode of transmission	168 (70.0)	72 (30.0)	63.9–75.4	38.40	<0.001
9	Early symptoms of leprosy	172 (71.7)	68 (28.3)	65.7–77.0	45.07	<0.001
10	Cardinal sign of Hansen's disease	181 (75.4)	59 (24.6)	69.6–80.4	62.02	<0.001
11	Nerve most commonly involved	145 (60.4)	95 (39.6)	54.1–66.4	10.42	0.001
12	Immune response in Type 1 lepra reaction	96 (40.0)	144 (60.0)	34.0–46.3	9.60	0.002
13	Standard MDT regimen for MB leprosy	179 (74.6)	61 (25.4)	68.7–79.7	58.02	<0.001
14	Complications of untreated disease	188 (78.3)	52 (21.7)	72.7–83.1	77.07	<0.001
15	Average incubation period	121 (50.4)	119 (49.6)	44.1–56.7	0.02	0.897
16	Mode of person-to-person spread	164 (68.3)	76 (31.7)	62.2–73.9	32.27	<0.001

Attitude domain (Q17–Q24)

Table 3 shows attitude responses. Favourable attitudes predominated: 97.5% agreed training should be mandatory, 94.2% recognised that patients face social stigma, and 89.2% correctly believed MDT is curative. However, only 40.8% of practitioners felt confident diagnosing early disease, and 65.8% endorsed the misconception that leprosy is highly contagious through casual contact (i.e., only 34.2% correctly rejected this myth), the two least favourable attitude items and both significantly different from chance in the unfavourable direction.

Table 3. Attitude domain — item-wise favourable/unfavourable responses (n=240).

Q.No	Item	Correct/ favourable n (%)	Incorrect/ unfavourable n (%)	95% CI (%)	χ^2 (df=1)	p-value*
17	Hansen's disease is still a public health problem	196 (81.7)	44 (18.3)	76.3–86.1	96.27	<0.001
18	Confident in diagnosing early disease	98 (40.8)	142 (59.2)	34.8–47.1	8.07	0.005
19	Leprosy patients face social stigma	226 (94.2)	14 (5.8)	90.4–96.5	187.27	<0.001
20	Willing to work in a leprosy clinic if assigned	205 (85.4)	35 (14.6)	80.4–89.3	120.42	<0.001
21	MDT effectively cures leprosy	214 (89.2)	26 (10.8)	84.6–92.5	147.27	<0.001
22	Training on leprosy should be mandatory	234 (97.5)	6 (2.5)	94.7–98.8	216.60	<0.001
23	Patients face discrimination due to fear of spread	221 (92.1)	19 (7.9)	88.0–94.9	170.02	<0.001
24	Correctly rejects casual-contact/high-contagion myth	82 (34.2)	158 (65.8)	28.5–40.4	24.07	<0.001

Practice domain (Q25–Q29)

Table 4 summarises practice indicators, which were the weakest domain overall. Only 30.8% of practitioners frequently or occasionally encountered suspected Hansen's disease patients, and only 28.7% had ever personally initiated treatment, both significantly below the midpoint ($p<0.001$), consistent with low direct clinical exposure. Encouragingly, 80.4% reported taking the correct next step (referral/diagnostic evaluation) when disease was suspected, and 88.3% reported educating patients about curability.

Table 4. Practice domain - item-wise responses (n=240).

Q.No	Item	Correct/ favourable n (%)	Incorrect/ unfavourable n (%)	95% CI (%)	χ^2 (df=1)	p-value*
25	Frequently/occasionally encounters suspected cases	74 (30.8)	166 (69.2)	25.3–36.9	35.27	<0.001
26	Correct next step when disease is suspected	193 (80.4)	47 (19.6)	74.9–84.9	88.82	<0.001
27	Has ever initiated treatment for Hansen's disease	69 (28.7)	171 (71.3)	23.4–34.8	43.35	<0.001
28	Educates patients on curability	212 (88.3)	28 (11.7)	83.7–91.8	141.07	<0.001
29	Aware of NLEP / national control programme	137 (57.1)	103 (42.9)	50.8–63.2	4.82	0.028

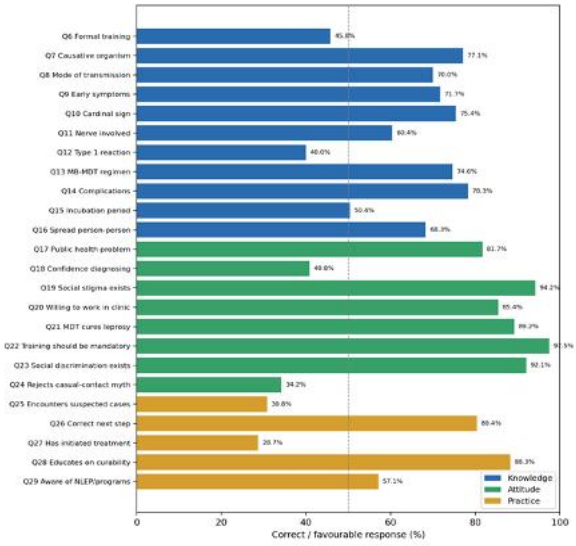

Figure 1. *Item-wise correct/favourable response rate (%) across knowledge (blue), attitude (green) and practice (amber) domains, n=240. Dashed line = 50% chance level.*

Comparison with parent studies

Table 5 and Figure 2 compare key indicators with Vaishali et al. (2025) and Bajaj et al. (2009). Practitioners in the present study were significantly less likely than undergraduates/interns in Vaishali et al. to correctly identify the causative organism (77.1% vs 96.6%, $\chi^2=48.78$, $p<0.001$) and the mode of transmission (70.0% vs 78.9%, $\chi^2=5.43$, $p=0.020$), and no different on recognising the cardinal sign (75.4% vs 72.4%, $\chi^2=0.48$, $p=0.487$). Conversely, knowledge that MDT cures leprosy was significantly higher than in both parent studies (89.2% vs 74.6% Vaishali, $p<0.001$; vs 73.0% Bajaj, $p<0.001$), and understanding of the transmission route was significantly better than in Bajaj et al.'s general-practitioner sample (70.0% vs 56.0%, $\chi^2=8.64$, $p=0.003$).

Table 5. Chi-square comparison of key indicators with parent studies.

Indicator	Present study	Comparator study	Comparator %	χ^2	p-value
Causative organism (M. leprae) identified correctly	77.1%	Vaishali et al.4 (n=323)	96.6%	48.78	<0.001
Mode of transmission identified correctly	70.0%	Vaishali et al.4 (n=323)	78.9%	5.43	0.020
Mode of transmission identified correctly	70.0%	Bajaj et al.1 (n=200)	56.0%	8.64	0.003

Cardinal sign identified correctly	75.4%	Vaishali et al.4 (n=323)	72.4%	0.48	0.487
Believes/knows leprosy (MDT) is curable	89.2%	Vaishali et al.4 (n=323)	74.6%	17.88	<0.001
Believes/knows leprosy (MDT) is curable	89.2%	Bajaj et al.1 (n=200)	73.0%	18.10	<0.001

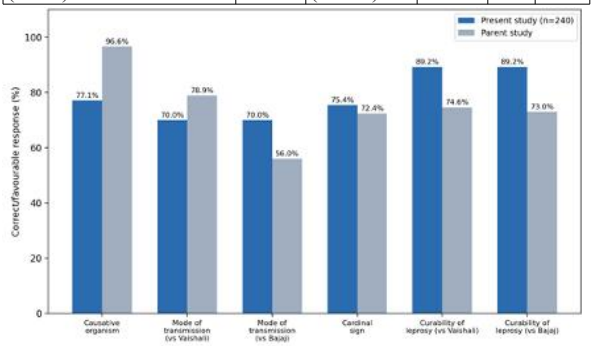

Figure 2. *Comparison of present-study indicators with Vaishali et al. (2025) and Bajaj et al. (2009).*

4.DISCUSSION

The present study evaluated the knowledge, attitude, and practice (KAP) regarding Hansen's disease among 240 non-dermatologist medical practitioners. The participants had a mean age of 36.4 ± 8.9 years, with males constituting 55.8% and females 44.2%. Most participants had more than five years of clinical practice (65%) and were employed in government hospitals (40%), reflecting a population with considerable clinical experience. Despite this, important deficiencies in awareness of Hansen's disease were identified, particularly in areas related to formal training, early diagnosis, and practical management.

The knowledge domain demonstrated generally satisfactory awareness regarding the causative organism (77.1%), cardinal signs (75.4%), multidrug therapy for multibacillary leprosy (74.6%), and complications of untreated disease (78.3%), all of which were significantly higher than the expected chance level ($p<0.001$). However, only 45.8% of participants had received formal training on Hansen's disease, while knowledge regarding the Type 1 lepra reaction (40.0%) and average incubation period (50.4%) remained inadequate. Similar gaps were observed by Vaishali et al. [19], who reported that 96.6% correctly identified the causative organism, 78.9% understood the mode of transmission, and 72.5% recognized the cardinal signs of leprosy, but awareness regarding treatment duration and disease management remained poor. Likewise, Ahmed et al. [21] reported inadequate knowledge among up to 52% of medical interns, emphasizing the continuing need for strengthening undergraduate and postgraduate education. Pandapatan et al. [17] also observed that only 12% of Barangay Health Workers possessed adequate knowledge, attributing this deficiency primarily to inadequate training. Similarly, Barbosa et al. [16] identified poor knowledge regarding the cause, transmission, and duration of Hansen's disease, particularly among community members, while Briden and Maguire [18] found that although healthcare workers had generally good knowledge, misconceptions regarding disease transmission and curability persisted. Maulana et al. [20] also emphasized the importance of identifying knowledge gaps using validated KAP questionnaires to improve education regarding leprosy reactions.

Attitude towards Hansen's disease was generally positive in the present study. Almost all participants believed that training on Hansen's disease should be mandatory (97.5%), recognized the presence of social stigma (94.2%), acknowledged that patients experience discrimination (92.1%), and correctly believed that multidrug therapy is curative (89.2%). Nevertheless, only 40.8% felt confident in diagnosing early Hansen's disease, while 65.8% still believed that the disease could spread through casual contact, indicating persistent misconceptions. Comparable observations were reported by Vaishali et al. [19], where 60% considered leprosy highly infectious and 46.8% believed that individuals with leprosy should not marry. Ahmed et al. [21] reported stigma among 33.3% of medical interns despite medical training. Likewise, Barbosa et al. [16] concluded that stigma and negative attitudes continue to exist even among healthcare workers, while Briden and Maguire [18] observed that many healthcare workers believed patients should remain separated from others because of misconceptions regarding infectivity. These findings collectively highlight that improving attitudes requires continuous education in addition to factual knowledge.

The practice domain represented the weakest component of the present study. Only 30.8% of practitioners reported frequently encountering suspected Hansen's disease cases, and merely 28.7% had initiated treatment themselves, reflecting limited direct clinical exposure. However, 80.4% appropriately referred suspected patients, 88.3% educated patients regarding curability, and 57.1% were aware of the National Leprosy Eradication Programme (NLEP). Similar findings were reported by Pandapatan et al. [17], where 67.3% demonstrated adequate practices, although knowledge and attitude remained poor due to insufficient training. Ahmed et al. [21] also emphasized that inadequate awareness among healthcare providers contributes to persistent myths and stigma, underscoring the need for regular refresher training.

Comparison with previous studies further supported these observations. Although practitioners in the present study correctly identified the causative organism in 77.1% of cases, this was significantly lower than 96.6% reported by Vaishali et al. [19] ($p<0.001$). Similarly, recognition of the mode of transmission (70.0%) was lower than the 78.9% reported by Vaishali et al. but significantly higher than the 56.0% observed by Bajaj et al. Conversely, awareness that multidrug therapy cures leprosy (89.2%) was significantly higher than that reported by both Vaishali et al. (74.6%) and Bajaj et al. (73.0%). These findings indicate that while awareness regarding treatment has improved, deficiencies remain in early diagnosis, disease transmission, and practical management. Overall, the study highlights the need for regular continuing medical education, structured training programmes, and reinforcement of national leprosy guidelines among non-dermatologist practitioners to facilitate early diagnosis, reduce stigma, and strengthen Hansen's disease control efforts.

CONCLUSION

The present study demonstrated that non-dermatologist medical practitioners possessed generally satisfactory knowledge regarding the causative organism, cardinal signs, multidrug therapy, and complications of Hansen's disease. Positive attitudes were observed towards the curability of the disease, the need for mandatory training, and recognition of the social stigma experienced by affected individuals. However, important deficiencies were identified in formal training, confidence in early diagnosis, understanding of Type 1 lepra reactions, incubation period, and misconceptions regarding disease transmission through casual contact. The practice domain revealed limited direct clinical exposure despite appropriate referral practices and patient education among most participants. Overall, the findings emphasize the need for regular continuing medical education, structured training programmes, and periodic awareness initiatives for non-dermatologist healthcare professionals. Strengthening knowledge and clinical competence will facilitate early diagnosis, timely referral, reduction of stigma, and improved implementation of the National Leprosy Eradication Programme, thereby contributing to better Hansen's disease control.

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