HANSENOLOGIA INTERNATIONALIS
hanseníase e outras doenças infecciosas
eISSN 1982-5161

https://doi.org/10.47878/hi.2024.v49.40301

ORIGINAL ARTICLE

Knowledge, attitudes, and practices on leprosy among dermatology residents in the Philippines: a cross-sectional study

Conhecimento, atitudes e práticas sobre hanseníase entre residentes de dermatologia nas Filipinas: um estudo transversal

Conocimientos, actitudes y prácticas sobre la lepra entre los residentes de dermatología de Filipinas: un estudio transversal

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HOW TO CITE THIS ARTICLE:
Balgomera MNB, Venida-Tablizo AA, Chavez CP, Abad-Venida ML, Protacio FV, Santos MP. Knowledge, attitudes, and practices on leprosy among dermatology residents in the Philippines: a cross-sectional study. Hansen Int. 2024;49:e40301. doi: https://doi.org/10.47878/hi.2024.v49.40301

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RECEIVED IN: 03/13/2024

ACCEPTED IN: 05/20/2024

PUBLISHED IN: 08/07/2024

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ABSTRACT

Introduction: leprosy is a chronic bacterial infection caused by *Mycobacterium leprae* and *Mycobacterium lepromatosis*, primarily affecting the skin and peripheral nerves. Dermatologists play an important role in diagnosing and treating patients affected with leprosy and are equipped with adequate knowledge about the clinical presentation and management of patients with leprosy. **Methods:** a cross-sectional study was conducted on the knowledge, attitudes, and practices of leprosy among dermatology residents in the Philippines using a self-administered online questionnaire. The

study was conducted in two phases: Phase I was the development of the questionnaire, and Phase II was the survey proper, where the questionnaire was administered to dermatology residents in the Philippines via convenience sampling. Descriptive statistics appropriate for the study variables were used. **Results:** in Phase I of the study, a questionnaire was validated by three leprosy and infectious disease experts and pilot-tested on ten dermatology graduates in the year 2022, showing that items had high scores for validity and reliability. Phase II involved administering the survey to dermatology residents. Data showed that overall, 46 of 118 participants (38.98%) obtained a satisfactory score of 80% and higher on knowledge, 101 of 118 (85.59%) exhibited a positive attitude, and 116 of 118 (98.31%) had adequate practices. Moreover, first-year residents exhibit lower attitude scores than those in higher years, and no significant differences in knowledge and practices were found based on the practice setting. **Conclusion:** results of the study show that less than half of the included resident dermatologists had satisfactory knowledge of leprosy. However, we identified gaps in these physician's knowledge, mainly in peripheral assessment nerve function, doses, and duration of treatment for leprosy peoples. On the other hand, participants were noted to have an overall positive attitude towards leprosy and adequate practices.

Keywords: *Leprosy. Knowledge. Attitude. Practice. Dermatology.*

RESUMO

Introdução: a hanseníase é uma infecção crônica causada pelo *Mycobacterium leprae* e *Mycobacterium lepromatosis*, que acomete principalmente a pele e os nervos periféricos. Os dermatologistas desempenham um papel importante no diagnóstico e tratamento dos doentes com hanseníase e estão capacitados com conhecimentos sobre a apresentação clínica e o tratamento dos doentes. **Métodos:** foi realizado um estudo transversal sobre os conhecimentos, atitudes e práticas sobre hanseníase entre os residentes de dermatologia nas Filipinas, utilizando-se um questionário autoadministrado *online*. O estudo foi realizado em duas fases: Fase I – no qual houve o desenvolvimento do questionário, e Fase II – a aplicação do questionário propriamente dito. O questionário foi administrado aos residentes de dermatologia nas Filipinas através de amostra por conveniência. Estatísticas descritivas adequadas às variáveis do estudo foram utilizadas. **Resultados:** na Fase I, o questionário foi validado por três especialistas em hanseníase e doenças infecciosas e testado como piloto com dez residentes em dermatologia no ano de 2022, mostrando que as questões tinham pontuações elevadas em termos de validade

e fidelidade. A Fase II envolveu a aplicação do questionário aos residentes em dermatologia, participantes do estudo. Os resultados mostraram que, 46 de 118 que responderam ao questionário (38,98%) obtiveram uma pontuação satisfatória de 80% ou mais em conhecimento, 101 de 118 (85,59%) exibiram uma atitude positiva e 116 de 118 (98,31%) tiveram práticas adequadas. Além disso, os residentes do primeiro ano apresentam pontuações mais baixas com relação à atitude do que os residentes dos anos mais avançados. Não foram encontradas diferenças significativas entre os conhecimentos e as práticas com base no contexto prático. **Conclusões:** os resultados do estudo mostraram que menos da metade dos residentes em dermatologia incluídos no estudo tinham conhecimento satisfatório sobre hanseníase. Foram identificadas lacunas no conhecimento, principalmente na avaliação da função nervosa, bem como, na dose e duração do tratamento de pacientes. Por outro lado, observou-se que os participantes tinham uma atitude positiva em relação à doença e práticas adequadas a hanseníase.

Palavras-chave: *Hanseníase. Conhecimento. Atitude. Prática. Dermatologia.*

RESUMEN

Introducción: la lepra es una infección bacteriana crónica causada por *Mycobacterium leprae* y *Mycobacterium lepromatosis*, que afecta principalmente a la piel y los nervios periféricos. Los dermatólogos desempeñan un papel importante en el diagnóstico y tratamiento de los pacientes afectados de lepra y disponen de conocimientos sobre la presentación clínica y el tratamiento de los pacientes. **Métodos:** se realizó un estudio transversal sobre los conocimientos, actitudes y prácticas de la lepra entre los residentes de dermatología en Filipinas utilizando un cuestionario autoadministrado en línea. El estudio se llevó a cabo en dos fases: la Fase I fue el desarrollo del cuestionario, y la Fase II fue la encuesta propiamente dicha, en la que el cuestionario se administró a residentes de dermatología de Filipinas mediante un muestreo de conveniencia. Se utilizaron estadísticas descriptivas apropiadas para las variables del estudio. **Resultados:** en la Fase I, tres expertos en lepra y enfermedades infecciosas validaron un cuestionario y lo sometieron a una prueba piloto con diez graduados en dermatología en el año 2022, demostrando que los ítems tenían puntuaciones altas de validez y fiabilidad. La Fase II consistió en administrar lo cuestionario a residentes de dermatología. Los datos mostraron que, en general, 46 de 118 participantes (38,98%) obtuvieron una puntuación satisfactoria del 80% o superior en conocimientos, 101 de 118 (85,59%) mostraron una actitud positiva y 116 de 118 (98,31%) tenían prácticas adecuadas. Además, los residentes de

primer año muestran puntuaciones más bajas en actitud que los de años superiores, y no se hallaron diferencias significativas en conocimientos y prácticas en función del ámbito de práctica. **Conclusiones:** los resultados del estudio muestran que menos de la mitad de los dermatólogos residentes incluidos tenían conocimientos satisfactorios sobre la lepra. Se identificaron lagunas en los conocimientos, principalmente en la evaluación de la función nerviosa y en la dosis y duración del tratamiento de las personas con lepra. Por otro lado, se observó que los participantes tenían una actitud general positiva hacia la lepra y prácticas adecuadas.

Palabras clave: *Lepra. Conocimientos. Actitud. Práctica. Dermatología.*

INTRODUCTION

Hansen's disease, or Leprosy, is a chronic infectious disease caused by the slow-growing bacteria *Mycobacterium leprae* and *Mycobacterium lepromatosis*. It affects various systems, primarily the skin, peripheral nerves, eyes, and mucosa of the upper respiratory tract. It is transmitted through respiratory droplets from a person with leprosy. To develop the disease, close, frequent, and prolonged exposure to a person with leprosy is needed. Leprosy has a wide range of clinical manifestations but mainly affects the skin. It is principally diagnosed based on clinical findings[1].

The World Health Organization (WHO) reported 967 new leprosy cases in 2021[2] in the Philippines. The Department of Health (DOH) National Leprosy Control Program (NLCP) reported a prevalence rate of 0.31 per 10,000 population and a case detection rate of 1.92 per 100,000 in 2019[3].

Leprosy is one of the neglected tropical diseases and is highly prevalent in low-income areas. Treatment with multi-drug therapy (MDT) is available; however, if there is poor early detection and no prompt treatment is given, patients may suffer and develop the complications of leprosy[4]. They will not only suffer from physical deformities but also experience challenges due to the stigma because of the disease's psychological, social, and economic impact on the patient's life[5].

Previous studies have examined knowledge, attitudes, and practices regarding leprosy among the general population and healthcare workers. Early detection and treatment of disease are necessary to reduce and prevent complications and disability. Moreover, low levels of knowledge and negative attitudes toward leprosy are associated with late diagnosis of the disease[6].

It has also been found that the level of knowledge and attitude of healthcare workers toward leprosy influences the health-seeking behavior of patients with leprosy[7]. Because of the stigma associated with leprosy, the lack of awareness

and poor attitude of people towards leprosy prevents patients from seeking help. It causes a delay in diagnosis until significant clinical manifestations and disability are already seen[8,9].

Only a few studies have been conducted in the Philippines that assess healthcare workers' knowledge, attitudes, and practices regarding leprosy. A recent study by Chavez et al.[11] conducted on 265 healthcare workers in a tertiary hospital showed that participants had high or medium knowledge of leprosy. However, there were still gaps in knowledge identified on leprosy about transmissibility. In terms of attitudes, the majority had positive attitudes toward leprosy. Despite this, there were still notable misconceptions about leprosy namely, transmission, transmissibility, and social engagement with people with leprosy. The presence of misconceptions and prejudices could lead to stigmatizing behaviors toward people with leprosy[11].

Dermatologists have a vital role in diagnosing and treating patients affected with leprosy competently and compassionately. Thus, dermatologists must be equipped with adequate knowledge about the clinical presentation and management of patients with leprosy[12]. Early recognition and treatment are prudent to control leprosy and prevent debilitating complications[13].

Having positive attitudes toward patients with leprosy can help decrease the stigma and increase the health-seeking behaviors of patients[8].

There is a lack of studies regarding dermatology residents' knowledge, attitudes, and practices of leprosy in the Philippines. To the knowledge of the primary investigator, this is the first study in the Philippines to aim to identify the knowledge, attitudes, and practices (KAP) of dermatology residents.

Identifying gaps in knowledge, attitudes, and practices is necessary to design standard guidelines that resident dermatologists can use in training and practice. The study's findings may also be used to identify areas of development toward improved evaluation and treatment protocols and increased patient health-seeking behavior.

METHODOLOGY

Study Design

An analytical cross-sectional study using a self-administered online questionnaire was conducted on the knowledge, attitudes, and practices of leprosy among dermatology residents in the Philippines.

This study included Dermatology Residents from all year levels in Philippine Dermatological Society (PDS)-accredited and applicant training institutions in the Philippines in 2023. Dermatology residents who didn't consent to participate were excluded from the study.

Sampling Design

Convenience sampling was done until the minimum sample size was met. Based on a level of significance of 0.05 and a desired width of the confidence interval of 10%, this study requires a minimum of 115 out of a total of 193 dermatology resident respondents from all PDS-accredited institutions and applicant institutions.

Data Collection

Data collection was done via a self-administered online survey. The study consisted of two phases: Phase I – the development of a validated questionnaire, and Phase II – the administration of the validated questionnaire.

Phase I: generation of KAP questionnaire regarding leprosy

The investigators prepared a questionnaire to assess the KAP of resident dermatologists on leprosy based on the Leprosy Clinical Practice Guidelines. Questions on knowledge included information on clinical presentation, diagnosis, and management; questions on attitudes included the disposition of participants when interacting with patients with leprosy; and questions on practices included proper clinical application and behavior when evaluating and managing patients with leprosy.

The generated questionnaire was reviewed by a panel of 3 leprosy and infectious disease experts from Rizal Medical Center consultant staff from the Department of Dermatology for content validation. These experts were recruited via purposive sampling. Each expert was asked to evaluate face and content validity based on the COSMIN criteria for content validity. Each expert provided scores on the three domains regarding relevance, clarity, and simplicity. A 4-point Likert scale was used per domain: 1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, and 4 = highly relevant, clarity (1 = not clear, 2 = somewhat clear, 3 = quite clear, and 4 = very clear), and simplicity (1 = not simple, 2 = somewhat simple, 3 = quite simple, and 4 = very simple). The item-level content validity index (I-CVI) was calculated. Items higher than I-CVI 0.80 were accepted, while those lower were subjected to discussion by the expert panel and the authors, and the item was then removed or modified until an acceptable I-CVI was obtained. Most items were deemed relevant, clear, and simple from the validation. A total of 41 questions were finalized to be included in the pre-final questionnaire.

After validation, the modified questionnaire was pilot-tested among ten dermatology residents who graduated in 2022 and selected via convenience sampling. After completing the questionnaire, feedback on each item was done. Significant remarks were noted, and modifications were made to improve the questionnaire. All items obtained average to high scores for

validity based on relevance, clarity, and simplicity of at least 70% per item. Reliability testing used Kuder-Richardson Formula 20 (KR-20) for the knowledge domain and Cronbach's alpha for test questions in the attitude and practices domains.

A final 40-item validated questionnaire was then used for Phase II of the study. Knowledge was measured by scoring 1 for each correct answer and 0 for the wrong answer. Attitude and practices were measured using a 5-point Likert scale based on the level of agreement.

Phase II: administration of the survey questionnaire

In Phase II of the study, the investigators invited 193 dermatology residents from 15 PDS-accredited institutions and three applicant institutions via electronic mail, Viber, Telegram, and Facebook messenger. The invitation included an introduction, the purpose of the study, and a link to the online questionnaire. The questionnaire was sent in Google Forms format to be answered and completed by the participants. It was estimated to be completed within 15 to 20 minutes. Of those sampled, 118 dermatology residents gave consent and answered the questionnaire.

Data Analysis

Descriptive statistics appropriate for the study variables were used. Continuous data was summarized using mean and standard deviation (SD). Categorical values, namely knowledge, attitudes, and practices, were analyzed and described as frequency and percentage. IBM SPSS version 26 was used for data analysis.

For this study, the KAP levels of the participants were measured based on Bloom's cut-off values. Participants who responded correctly to at least 80% of the items were deemed to have attained satisfactory knowledge. If the score is below 80%, then this will be considered as below satisfactory. A score of 1 for each correct answer and 0 for wrong answers will be given. Specifically, a minimum score of 5 on clinical manifestations and diagnosis and a minimum score of 7 on management and treatment monitoring were used to determine each participant's satisfactory knowledge level.

To evaluate the overall attitude of residents towards leprosy, Likert responses were assigned with numerical values (strongly disagree = 1, disagree = 2, neither agree nor disagree = 3, agree = 4, strongly agree = 5). A process of item reversal was conducted to mitigate the influence of negatively-worded items (specifically, items 2, 3, and 9). Subsequently, the individual scores of each participant were averaged to ascertain their attitudes toward leprosy patients. The same approach employed for transforming data and establishing score ranges for interpretation in assessing attitudes was applied to evaluate the overall practices of resident doctors towards leprosy. This study ascertained

the sufficiency of practices among participants based on their responses to the eleven practice-related items.

The Kruskal-Wallis H test was used to determine if there is a significant difference in KAP on leprosy between dermatology residents per year level. The Mann-Whitney U test was used to determine if there is a significant difference in the KAP on leprosy of dermatology residents between government and private training institutions.

RESULTS

Demographic Data

Table 1 shows the demographic profile of the participants sampled in the knowledge, attitudes, and practices questionnaire.

The participants from the data obtained were predominantly 25-30 years old (60.17%, n = 71/118). They were 82.20% female (n = 97/118) and 17.80% male (n = 21/118). They were also primarily third-year residents (35.59%, n = 42/118) and practiced in government institutions (85.59%, n = 101/118).

Table 1 – Demographic profile of resident doctors (n = 118).

	Frequency (%)
Age, years	
25-30	71 (60.17)
31-35	44 (37.29)
36 and up	3 (2.54)
Sex	
Male	21 (17.80)
Female	97 (82.20)
Year Level	
1st year	39 (33.05)
2nd year	37 (31.36)
3rd year	42 (35.59)
Setting of practice	
Government Institution	101 (85.59)
Private	17 (14.41)

Source: Created by the author.

Knowledge on leprosy

In terms of knowledge, data showed participants had below satisfactory knowledge of clinical manifestation on which nerves are most commonly affected (62.71%, n = 74/118) and in identifying the type of leprosy according to Ridley-Jopling Classification (70.34%, n = 83/118). In terms of diagnosis, participants had below satisfactory knowledge of the interpretation of slit-skin smear (52.54%, n = 62/118), on which sites to take samples for slit-skin smear (71.19%, n = 84/118), and on which nerves should be tested (69.49%, n = 82/118). For the management, participants also had below satisfactory knowledge on frequency and duration of treatment for patients with paucibacillary leprosy (33.05%, n = 39/118), on when repeat laboratories should be requested (56.78%, n = 67/118), on dose and duration of treatment with prednisone in patients in leprae reaction (45.76%, n = 54/118), and second-line treatment for Type 1 leprae reaction (30.51%, n = 36/118), according table 2.1.

Table 2.1 – Distribution of residents' correct answers on items about leprosy.

		Frequency (%)
Clinical manifestations		
1	A hypopigmented patch with hypoesthesia is a cardinal sign of leprosy.	118 (100.00)
2	Ulnar and peroneal nerves are the most commonly affected nerves.	74 (62.71)
3	According to the World Health Organization (WHO) protocol, a patient should have 1-5 lesions to be classified as paucibacillary leprosy.	108 (91.53)
4	Type 2 leprae reaction presents with new painful, erythematous nodules with associated systemic symptoms.	106 (89.83)
5	According to the Ridley-Jopling Classification, the tuberculoid type of leprosy would present with five or fewer erythematous or hypopigmented plaques less than 10 cm in diameter and with a bacillary index of 0.	97 (82.20)
6	A patient presents with numerous large macules, papules, and nodules with ill-defined outer borders and sharply marginated inner borders ("inverted saucer") symmetrically distributed on the trunk and extremities. There is also associated hypoesthesia but with normal sweating. The bacillary index was noted to be 3+. According to the Ridley-Jopling Classification, a patient is classified to have Borderline Lepromatous Leprosy.	83 (70.34)

		Frequency (%)
Diagnosis		
1	A complete blood count, liver function test, and slit-skin smear are requested before initiating treatment.	111 (94.07)
2	A positive slit-skin smear means a patient has multibacillary leprosy.	62 (52.54)
3	In performing the slit-skin smear test, samples should be taken from 2 earlobes and 2 to 4 active lesions on the extensor surfaces of the arms and legs.	84 (71.19)
4	The bacillary index is also used to detect relapse.	106 (89.83)
5	Sensory nerve conduction measurement should be done on radial, median, ulnar, and sural nerves.	82 (69.49)
6	Sensory nerve function test, motor nerve function test, and ophthalmologic evaluation are done at baseline and during monitoring.	117 (99.15)
Management and treatment monitoring		
1	Patients with paucibacillary leprosy are treated for 6-9 months with rifampicin and dapsone monthly.	39 (33.05)
2	Dapsone may cause hemolytic anemia in individuals with glucose-6-phosphate dehydrogenase (G6PD) deficiency.	118 (100.00)
3	The dosage and frequency of rifampicin for adults with leprosy is 600 mg once a month.	90 (76.27)
4	For children aged 10-14 years with leprosy, the dosage and frequency of taking Dapsone is 50 mg once a day.	97 (82.20)
5	In patients undergoing treatment, repeat laboratories should be done one month after initiation, then quarterly until the end of treatment.	67 (56.78)
6	Leprae reaction may occur upon, during, and after multi-drug therapy (MDT).	106 (89.83)
7	The dose and duration of treatment with prednisolone in patients with leprae reaction is 0.5-1 mg/kg/day, tapered by 5 mg every two weeks for 20 weeks.	54 (45.76)
8	The second-line management for patients with Type 1 leprae reaction not responding to prednisolone is cyclosporine.	36 (30.51)

Source: Created by the author.

It can be observed of 118 participants, participants with satisfactory knowledge about clinical manifestations, diagnosis, and management of leprosy are 86 (72.88%), 74 (62.71%), and 14 (11.86), respectively. Computing the overall score for the 20 items, only 46 of 118 participants obtained a satisfactory score (16 and above) regarding knowledge of leprosy, according table 2.2.

Table 2.2 – Distribution of residents according to the number of correct answers to leprosy-related questions.

	Satisfactory (80% and up)	Below satisfactory (<80%)
Domain	**Frequency (%)**	
Clinical manifestations (6 items)	86 (72.88)	32 (27.12)
Diagnosis (6 items)	74 (62.71)	44 (37.29)
Management and treatment monitoring (8 items)	14 (11.86)	104 (88.14)
Overall score (20 items)	46 (38.98)	72 (61.02)

Source: Created by the author.

Attitude toward leprosy

In terms of attitude, most of the participants showed a positive attitude toward leprosy. More than 90% of the participants are willing to manage patients with leprosy, believe that people with leprosy should have the same opportunities as others, and feel compassion toward them. Despite the majority who showed positive attitudes, around 20% are still concerned that they will get infected when interacting with people with leprosy, and around 5% are still not comfortable performing procedures on people with leprosy, according table 3.1.

Table 3.1 – Attitude assessment of dermatology residents on leprosy.

		SDA	D	N	A	SA
Items		**Frequency (%)**				
1	I am willing to be involved in diagnosing and managing people with leprosy.	0	0	2 (1.69)	24 (20.34)	92 (77.97)
2	I am concerned that I will get leprosy infection from interacting with people with leprosy.	18 (15.25)	50 (42.37)	21 (17.80)	19 (16.10)	10 (8.47)

	Items	SDA	D	N	A	SA
		Frequency (%)				
3	I believe that people with leprosy should isolate themselves.	29 (24.58)	44 (37.29)	29 (24.58)	10 (8.47)	6 (5.08)
4	A person with leprosy should have the same opportunities as others in the community.	0	0	1 (0.85)	23 (19.49)	94 (79.66)
5	I feel compassion for people with leprosy.	0	0	1 (0.85)	19 (16.10)	98 (83.05)
6	I am confident that I will be able to recognize and diagnose people presenting with signs and symptoms of leprosy.	0	0	5 (4.24)	56 (47.46)	57 (48.31)
7	I feel comfortable working with someone with leprosy.	0	1 (0.85)	12 (10.17)	50 (42.37)	55 (46.61)
8	I believe that personal belongings should not be shared with people with leprosy.	20 (16.95)	33 (27.97)	27 (22.88)	24 (20.34)	14 (11.86)
9	I am comfortable performing procedures such as slit-smear tests on people with leprosy.	0	7 (5.93)	15 (12.71)	43 (36.44)	53 (44.92)

Legend: SDA – Strongly Disagree, DA – Disagree, N – Neither Agree nor Disagree, A – Agree, SA – Strongly Agree.
Source: Created by the author.

A notable 85.59% of the residents exhibited a positive attitude, which could indicate strong agreement and openness towards leprosy patients. In contrast, a smaller subset of 14.41% held a neutral attitude, signifying a moderate stance. On the other hand, no respondents fell within the negative attitude. This absence of negativity underscores the lack of aversion and highlights the predominantly positive outlook of the surveyed participants, according tabel 3.2.

Table 3.2 – General attitudes of residents towards leprosy patients.

Interpretation (range)	Frequency (%)
Positive attitude (3.68-5.00)	101 (85.59)
Neutral attitude (2.34-3.67)	17 (14.41)
Negative attitude (1.00-2.33)	0

Source: Created by the author.

Practices toward leprosy

The results indicated that 98.31% of participants could be classified as having adequate practices when treating patients with leprosy, while 1.69% were classified as having developing practices towards leprosy. This outcome underscores that the surveyed participants demonstrate practices deemed adequate in-patient care for individuals with leprosy. Despite the adequate practices shown in the data, 5.93% neither agree nor disagree with performing monofilament testing during the examination and examining close contacts, and 4.24% on using slit-skin smear, according table 4.1 and 4.2.

Table 4.1 – Practices assessment of dermatology residents on leprosy.

	Items	SDA	D	N	A	SA
		Frequency (%)				
1	Practice general protection measures must be taken when working with people with leprosy.	0	5 (4.24)	8 (6.78)	44 (37.29)	61 (51.69)
2	Perform complete physical examination, including ophthalmologic, sensory, and motor nerve function tests.	0	0	2 (1.69)	15 (12.71)	101 (85.59)
3	Perform history and physical examination in a private space or area in the hospital.	0	1 (0.85)	2 (1.69)	24 (20.34)	91 (77.12)
4	Perform monofilament testing to assess sensory nerve function.	1 (0.85)	1 (0.85)	7 (5.93)	17 (14.41)	92 (77.97)
5	Use slit-skin smear for diagnosis, monitoring response to treatment, and when there is suspicion of relapse after treatment.	0	0	5 (4.24)	17 (14.41)	96 (81.36)

Items		SDA	D	N	A	SA
		Frequency (%)				
6	Inform and educate patients on possible leprosy reactions.	0	0	1 (0.85)	14 (11.86)	103 (87.29)
7	Advise the patient and family of the infectivity of the condition.	0	0	2 (1.69)	17 (14.41)	99 (83.90)
8	Examine close contacts for signs of leprosy.	0	0	7 (5.93)	18 (15.25)	93 (78.81)
9	Teach the patient the proper care of eyes, hands, and feet.	0	0	3 (2.54)	10 (8.47)	105 (88.98)
10	Properly document consultations using charts for initial visits and subsequent follow-ups.	0	0	1 (0.85)	14 (11.86)	103 (87.29)
11	Advise patients to join support groups.	0	1 (0.85)	2 (1.69)	23 (19.49)	92 (77.97)

Legend: SDA – Strongly Disagree, DA – Disagree, N – Neither Agree nor Disagree, A – Agree, SA – Strongly Agree.
Source: Created by the author.

Table 4.2 – Overall practices of residents towards leprosy patients.

Interpretation (range)	Frequency (%)
Adequate practice (3.68-5.00)	116 (98.31)
Developing practices (2.34-3.67)	2 (1.69)
Inadequate practices (1.00-2.33)	0

Source: Created by the author.

KAP of residents by year level

At a significance level of 0.05, the results indicate a significant difference in residents' attitudes towards leprosy. Specifically, first-year residents exhibit significantly lower attitude scores than second and third-year residents ($p = 0.010$). At the same alpha level, there are no significant differences among residents of different year levels in their overall knowledge scores ($p = 0.670$) or practices ($p = 0.267$) related to leprosy, according table 5.

Table 5 – Knowledge, Attitudes, and Practices of residents grouped by year level.

	1st year (n = 39)	2nd year (n = 37)	3rd year (n = 42)	
	Median [min, max]			*p*-value
Knowledge				
Clinical manifestations (6 items)	5 [3, 6]	5 [3, 6]	5 [2, 6]	0.353
Diagnosis (6 items)	5 [2, 6]	5 [2, 6]	5 [3, 6]	0.652
Management and treatment monitoring (8 items)	5 [3, 7]	5 [2, 8]	5 [3, 8]	0.457
Overall score (20 items)	15 [10, 19]	15 [10, 20]	15.5 [9, 18]	0.139
Attitudes	4.00[b] [3.00, 4.89]	4.33[a] [3.33, 5.00]	4.22[a] [3.67, 5.00]	0.010*
Practices	4.82 [3.55, 5.00]	4.82 [3.00, 5.00]	4.91 [4.09, 5.00]	0.441

Notes:
• Statistical test used: [a]Kruskal-Wallis H-Test, [b]One-Way ANOVA.
• Significant at $p < 0.05$.
Source: Created by the author.

KAP of residents by institution

When considering the practice setting for participants, those from private institutions exhibited significantly lower attitude scores than residents from government institutions (p = 0.025). However, there were no significant differences in the residents' knowledge (p = 0.777) and practices (p = 0.835) when grouped according to their practice setting.

	Government (n = 101)	Private (n = 17)	*p*-value
Knowledge			
Clinical manifestations (6 items)	5 [3, 6]	5 [2, 6]	0.364
Diagnosis (6 items)	5 [2, 6]	5 [2, 6]	0.767
Management and treatment monitoring (8 items)	5 [2, 8]	6 [3, 7]	0.401
Overall score (20 items)	15 [10, 20]	15 [9, 18]	0.777

	Government (n = 101)	Private (n = 17)	*p*-value
Attitudes	4.22 [3.00, 5.00]	4.00 [3.33, 4.67]	0.025*
Practices	4.91 [3.55, 5.00]	4.91 [3.00, 5.00]	0.835

Source: Created by the author.

DISCUSSION

This cross-sectional study showed that less than half of the participants had satisfactory knowledge of leprosy. However, the majority of the participants had positive attitudes and good practices. Previous studies have evaluated knowledge of, attitudes, and practices on leprosy among healthcare workers. To our knowledge, the investigators only found one pilot survey conducted in China, which included the assessment of the knowledge and skills in diagnosis and management of leprosy and attitude towards leprosy among dermatologists[12]. The findings of this study show that knowledge gaps mainly centered on skills in assessment and palpation of involved nerves and nerve function. These findings were consistent with another study by Chen et al.[13] conducted in China, where doctors working in dermatologic services also had inadequate knowledge of nerve function assessment. This is important in diagnosing and managing patients with leprosy, as knowing the affected nerves can help prevent debilitating complications. This can be addressed through lectures and training workshops addressing proper assessment of patients with leprosy, emphasizing nerve function testing. In a study by Bunyaratavej et al.[10] done in Thailand, researchers identified that general physicians can diagnose leprosy. However, they could still identify gaps in knowledge as the participants in the study were unable to perform a complete physical examination and had limited knowledge of slit-skin smear[10].

As for the treatment, gaps in knowledge were determined to be in the dose, frequency, and duration of medications to be given in paucibacillary leprosy and leprae reactions. Similar gaps were identified in other studies where approximately 30% of healthcare practitioners did not know the treatment protocol for paucibacillary leprosy and multibacillary leprosy[13,14]. They attributed the gaps in the diagnosis and management of patients with leprosy to the lack of experience handling patients with leprosy in their medical practice.

Overall, dermatology residents had positive attitudes and adequate practices, as shown in this study. Despite this, few respondents had a neutral

attitude regarding working with persons with leprosy. Findings were consistent with the study by Chavez et al.[11], where healthcare workers in a tertiary hospital in the Philippines also had positive attitudes toward persons with leprosy. This was attributed to the campaigns, seminars, and lectures conducted to spread awareness about leprosy and eliminate stigma[11]. In another study in New Delhi, doctors still hesitate to interact with people with leprosy and still consider it as a social stigma. Because of this finding, they emphasized and recommended further training, workshops, and campaigns to educate more practitioners and clinicians and eliminate the stigma associated with leprosy[14].

Data from our study also showed no significant difference in the knowledge and practice scores across different year levels and according to the setting of practice among the participants. However, the lowest overall mean score for knowledge was still in year levels 1 and 2. In terms of attitudes, participants in year level 1 and those from private institutions had significantly lower attitude scores.

The study, therefore, recommended that physicians and specialists be competent to evaluate and diagnose patients with leprosy.

LIMITATIONS AND RECOMMENDATIONS

Since the study was conducted via a self-administered online questionnaire, there may have been limitations due to recall and social acceptability biases. To minimize these limitations, participants' anonymity and confidentiality were ensured to encourage honest and open answers. There may also be limited control over the survey environment. Therefore, we recommended using mixed methods of online and offline surveys, including phone interviews, in-person surveys, or focused group discussions, to allow for further clarification and improved facilitation of the questionnaire.

CONCLUSION

Findings from this study show that less than half of the resident dermatologists in PDS-accredited and applicant institutions had satisfactory knowledge of leprosy. Most participants had a positive attitude towards leprosy and adequate practices. We identified gaps in knowledge, mainly in nerve function assessment and the dose and duration of treatment for leprosy people. This study can serve as a guide in identifying areas of improvement for training dermatology residents and improving the knowledge and skills of residents in diagnosis and managing patients with leprosy. It can be used to design training programs tailored to address the specific areas of diagnosis and management and improve the expertise of dermatology residents. Addressing these gaps can lead to better patient care and outcomes.

ACKNOWLEDGMENT: *the authors would like to acknowledge Rizal Medical Center, Pasig City, Philippines, for its invaluable support and resources in conducting this research. Their support greatly facilitated the completion of this study.*

AUTHORS' CONTRIBUTIONS: ***Balgomera MN*** *has contributed to the design of the work, acquisition of data, analysis and interpretation of data, drafting the manuscript, revising manuscript, and final approval of the version.* ***Tablizo A***, ***Chavez C***, ***Venida ML***, ***Protacio FV***, *and* ***Santos M*** *have contributed to the design of the work, drafting the manuscript, revising manuscript, and final approval of the version.*

AVAILABILITY OF DATA AND MATERIAL: *not applicable.*

CONFLICTS OF INTEREST: *the authors have no conflicts of interest to declare.*

ETHICAL APPROVAL AND INFORMED CONSENT: *aproved by Rizal Medical Center - Institutional Review Board. Research protocol code 2023-D-#017-FM-1.*

FUNDING: *this research was funded by the Culion Foundation, Inc. The funding agency had no role in the study's design, conduct, analysis, or interpretation. The authors are solely responsible for its content.*

PREPRINT: *not applicable.*

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