

## Knowledge and attitudes on leprosy of healthcare workers in a tertiary government hospital in the Philippines

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### Summary

**Background/Objectives** The drivers of stigma may vary from one society or country to another; thus, it is necessary to identify these drivers so that stigma elimination programs would be locally relevant. This study aimed to determine the current knowledge and attitudes on leprosy of healthcare workers in a tertiary government hospital in the Philippines which will serve as the basis for our future leprosy awareness campaigns.

**Methods** We conducted a descriptive cross-sectional study among 265 healthcare workers in Rizal Medical Center (RMC), Philippines from January to March 2020 using a self-administered questionnaire. Descriptive statistics were used to describe the demographics and study variables.

**Results** A majority had high (36.2%) or medium (35.5%) knowledge on leprosy. A majority (62.3%) had positive attitudes towards leprosy. However, only 18.5% knew that leprosy is transmitted through inhalation and a majority thought that it is transmitted either through body fluids and secretions (52.8%) or open wounds (27.5%). Only about half knew that a patient on treatment can no longer transmit the disease and does not need to be isolated, and that a patient who has completed treatment but still exhibits manifestations of the disease can no longer transmit the disease.

**Conclusion** Although a majority had either high or medium knowledge on leprosy and a positive attitude towards leprosy, we identified misconceptions and knowledge

gaps centered on its mode of transmission and transmissibility which can lead to inappropriate fear of acquiring the disease from patients.

*Keywords:* Leprosy, beliefs, stigma, attitude, knowledge

## **Introduction**

Leprosy has been eliminated as a public health problem at the global level since year 2000.<sup>1</sup> In 2019, over 200,000 new cases were reported worldwide, 96% of which come from the 23 global priority countries.<sup>2</sup> The Philippines is one of these global priority countries<sup>3</sup> and although elimination as a public health problem at the national level has been sustained, there are still pockets of high endemicity.<sup>4</sup> In 2020, 1057 new cases were detected in the country with the highest number of new cases registered in the National Capital Region (NCR).<sup>5</sup>

To further reduce the burden of leprosy in the country, interventions are now focused on early case detection and prompt treatment.<sup>6</sup> One barrier to such is the stigma associated with leprosy.<sup>2,6-9</sup> This has dated back to ancient times and has driven persons affected with leprosy towards concealment and hesitancy in seeking help, leading to disease progression and facilitating transmission within families and communities.<sup>6,8-11</sup> In addition, stigma may also affect treatment uptake and adherence, an important factor for the elimination of a chronic infectious disease.<sup>12</sup> Stigma, defined by Goffman<sup>13</sup> as an attribute that makes an individual different from normal people, is a complex concept that depends not only on an individual's undesirable attributes, but also on the social context surrounding that individual.<sup>7</sup> Fear of transmission, misconceptions, inadequate knowledge, and negative attitudes are some of the drivers of stigma.<sup>7-11,14-16</sup> The drivers of stigma may vary from one society, culture, or country to another; thus it is necessary to identify these so that stigma elimination programs can be tailored.<sup>7,11,14,17</sup> Stigma exists not only in communities but also in the healthcare setting.<sup>2,15</sup> Because healthcare workers (HCWs) hold a respected position within a social setting, their behaviors and attitudes may reinforce the stigma associated with a disease. Consequently, their behaviors and attitudes towards stigmatizing diseases must be examined because stigma in the healthcare setting compromises patients' access to quality health care and successful health outcomes.<sup>11,18</sup> Despite this, stigma reduction is not routinely incorporated in the delivery or evaluation of health services.<sup>15</sup>

Rizal Medical Center (RMC) is a Department of Health (DOH)-retained tertiary hospital in Pasig, NCR, Philippines, that is poised to become an end-referral center in the Eastern NCR and nearby Region IV-A provinces in 2022. As an end-referral center, the hospital is preparing to see more leprosy cases, particularly those that require management of reactions, rehabilitation, and hospitalization, thus it is imperative to ensure a stigma-free healthcare environment. To achieve this, the RMC Department of Dermatology, in partnership with the National Leprosy Control Program (NLCP), regularly conducts stigma elimination campaigns, including information-based leprosy awareness campaigns, for HCWs in RMC and nearby health facilities. However, because of the paucity of studies investigating the knowledge and attitudes on leprosy of HCWs in the Philippines, we have conducted these campaigns in a blanket fashion. In this context, knowing the current knowledge and attitudes of HCWs in our institution is necessary to identify if there are misconceptions, knowledge gaps, and other possible determinants of stigma that should be addressed. We therefore conducted this study to serve as our basis for future leprosy awareness campaigns for HCWs.

## Materials and methods

### STUDY DESIGN, SAMPLE SIZE DETERMINATION, AND SAMPLING

A descriptive cross-sectional study was conducted among HCWs in RMC. Based on the study by Wijerante *et al.*<sup>9</sup> among HCWs in Sri Lanka, the assumed frequency of respondents demonstrating incorrect belief on the transmissibility of leprosy is 43%. For a 95% confidence interval and an acceptable error of 0.05, a minimum sample size of 298 was calculated from the study population of 1,417 using Epi Info 7. Adding 20% to the minimum sample size to account for possible refusal, unavailability, and incomplete responses, a total of 358 employees were selected.

HCWs in RMC are divided into four main hospital divisions—Medical, Nursing, Hospital Operations and Patient Support (HOPS), and Finance. Because they may differ in terms of educational background and exposure to leprosy patients, stratified random sampling was utilized to ensure adequate representation of each division: 198 of 782 from Medical, 113 of 447 from Nursing, 30 of 119 from HOPS, and 17 of 69 from Finance were randomly selected to participate.

### QUESTIONNAIRE PREPARATION

The self-administered questionnaire was prepared by the authors based on our experience caring for leprosy patients and on the studies conducted by Wijerante *et al.*<sup>9</sup> and Tabah *et al.*<sup>19</sup> The questionnaire was sent to 3 leprosy experts for review. They were asked to independently evaluate each item in the questionnaire and instructed to mark the problem indicator box and give specific comments about the potential problem.<sup>20</sup> Revisions were made to address the potential problems. After expert review, the questionnaire was pre-tested by 20 HCWs. After answering the questionnaire, the researchers interviewed them individually for feedback and to identify potential problems. Subsequent modifications and revisions were made to improve the quality and comprehensibility of the questionnaire. The final questionnaire consisted of 29 items, with 4 questions on demographics, 9 close-ended questions on knowledge, and 16 statements on attitudes evaluated by the participants using a 5-point Likert scale.

### QUESTIONNAIRE ADMINISTRATION

Data gathering was done from January to March 2020. The investigators physically distributed and collected the questionnaires to the selected participants' offices or departments. Selected participants who did not consent to participate or who were unavailable after 3 attempts were excluded. The questionnaire took approximately 15 minutes to answer.

### OPERATIONAL DEFINITIONS

Adopting Kaliyaperumal's<sup>21</sup> definitions, we defined knowledge as the individual's understanding of leprosy and attitude as his/her feelings towards leprosy, including pre-conceived ideas towards it. A score of 1 was given to a correct answer and 0 to a wrong answer for each item in the questionnaire. To measure the overall knowledge and attitudes of participants, we used Bloom's cut off point: >80% ( $\geq 7$  of 9), 60–80% (5–6 of 9), and <60% ( $\leq 4$  of 9) correct answers corresponds to high, medium, and low knowledge on leprosy; >80% ( $\geq 12$  of 16), 60–80% (9–11 of 16), and <60% ( $\leq 8$  of 16) positive answers (agree or strongly agree) corresponds

**Table 1.** Demographic characteristics of participants

	Mean ( $\pm$ SD) or frequency (%) <i>n</i> = 265
Age, in years	38 ( $\pm$ 11.14)
Sex	
Female	172 (65%)
Male	90 (34%)
Did not specify	3 (1%)
Division	
Medical	152 (57%)
Nursing	84 (32%)
Hospital Operations and Patient Support	18 (7%)
Finance	11 (4%)
Encountered a person with leprosy	
Yes	90 (34%)
No	175 (66%)

to positive, intermediate/mixed, and negative attitudes on leprosy, respectively. Respondents who answered, 'no opinion' to  $\geq 50\%$  ( $\geq 8$  of 16) of the statements were reported as having 'mostly no opinion'.

#### DATA PROCESSING AND ANALYSIS

Data were entered and analyzed using Microsoft Excel. Data entry was checked for completeness and accuracy before analysis. Incomplete questionnaires, except for questions on demographic characteristics, were not included in the analysis. Descriptive statistics were used to describe the demographics and study variables.

#### ETHICAL CONSIDERATIONS

This study was conducted in accordance with the Declaration of Helsinki and was approved by the RMC Institutional Review Board (2019-D-#26-RP-3.1). Participation in the study was voluntary and all participants signed an informed consent form before answering the questionnaire. To maintain anonymity, questionnaires were labelled only using pre-assigned numbers.

#### Results

Table 1 shows the demographic characteristics of participants and Table 2 shows their knowledge and attitudes on leprosy according to division. Out of the 265 HCWs, 96 (36.2%) had high, 94 (35.5%) had medium, and 75 (28.3%) had low knowledge on leprosy. Table 3 shows their knowledge on the cause and transmission of leprosy and Table 4 shows their knowledge on clinical manifestations and treatment of leprosy.

In terms of attitudes, 165 (62.3%) had positive, 62 (23.4%) had intermediate, and 28 (10.6%) had negative attitude towards leprosy. Table 5 shows their attitudes toward patients with leprosy and Table 6 shows their attitudes toward self, if diagnosed with leprosy.

**Table 2.** Knowledge and attitudes on leprosy according to division

	Frequency (%)
<b>Knowledge</b>	
<i>Medical Division</i>	<i>n</i> = 152
High knowledge	61 (40%)
Medium knowledge	54 (36%)
Low knowledge	37 (24%)
<i>Nursing Division</i>	<i>n</i> = 84
High knowledge	32 (38%)
Medium knowledge	34 (41%)
Low knowledge	18 (21%)
<i>Hospital Operations and Patient Support Division</i>	<i>n</i> = 18
High knowledge	3 (17%)
Medium knowledge	4 (22%)
Low knowledge	11 (61%)
<i>Finance</i>	<i>n</i> = 11
Medium knowledge	2 (18%)
Low knowledge	9 (82%)
<b>Attitudes</b>	
<i>Medical Division</i>	<i>n</i> = 152
Positive attitude	100 (66%)
Intermediate attitude	33 (22%)
Negative attitude	16 (11%)
Mostly no opinion	3 (2%)
<i>Nursing Division</i>	<i>n</i> = 84
Positive attitude	56 (67%)
Intermediate attitude	22 (26%)
Negative attitude	5 (6%)
Mostly no opinion	1 (1%)
<i>Hospital Operations and Patient Support Division</i>	<i>n</i> = 18
Positive attitude	8 (44%)
Intermediate attitude	3 (17%)
Negative attitude	4 (22%)
Mostly no opinion	3 (17%)
<i>Finance</i>	<i>n</i> = 11
Positive attitude	1 (9%)
Intermediate attitude	4 (36%)
Negative attitude	3 (27%)
Mostly no opinion	3 (27%)

## Discussion

A majority of the HCWs in RMC had either high or medium overall knowledge on leprosy. Eighty-four percent knew that leprosy is caused by bacteria, 77% knew that brief interactions will not lead to transmission, and 93% knew that leprosy is curable. Our findings may in part be attributed to the stigma elimination campaigns that we conducted in our institution in partnership with the NLCP. In the past years, we conducted lectures, seminars and distributed information, education, and communication (IEC) materials about leprosy. We also conducted activities that allowed patients with leprosy to share their insights and experiences with HCWs.

Despite this, only 19% of our respondents correctly knew that leprosy is transmitted through inhalation. Instead, majority thought that it is transmitted through body fluids, secretions,

**Table 3.** Knowledge on cause and transmission of leprosy

	Frequency (%)
<i>What causes leprosy?</i>	
<b>Bacteria</b>	<b>222 (83.8%)</b>
Genetic	31 (11.7%)
Dirty environment	26 (9.8%)
Poor hygiene	22 (8.3%)
Food or water	6 (2.3%)
Curse	1 (0.4%)
I don't know	12 (4.5%)
<i>How is leprosy transmitted?</i>	
<b>Through inhalation</b>	<b>49 (18.5%)</b>
Through body fluids and secretions	140 (52.8%)
Through open wounds	73 (27.5%)
Through touch	37 (14.0%)
Through food or water	5 (1.9%)
I don't know	20 (7.5%)
<i>Can you acquire leprosy by briefly interacting, such as shaking hands, with a patient with leprosy?</i>	
<b>No</b>	<b>203 (76.6%)</b>
Yes	38 (14.3%)
I don't know	24 (9.1%)
<i>Can a patient with leprosy undergoing treatment transmit the disease?</i>	
<b>No</b>	<b>143 (54.0%)</b>
Yes	75 (28.3%)
I don't know	47 (17.7%)
<i>Should a patient with leprosy undergoing treatment be isolated?</i>	
<b>No</b>	<b>129 (48.7%)</b>
Yes	111 (41.9%)
I don't know	25 (9.4%)
<i>If a patient with leprosy has completed treatment but still has manifestations of the disease, can he/she transmit the disease?</i>	
<b>No</b>	<b>129 (48.7%)</b>
Yes	78 (29.4%)
I don't know	58 (21.9%)

and open wounds. In addition, about half did not know that patients on treatment can no longer transmit the disease and do not need to be isolated, and that patients who have completed treatment but still exhibit manifestations of the disease can no longer transmit the disease.

Most of the HCWs in RMC had positive overall attitudes toward leprosy. More than 70% felt that it was okay to engage in casual interactions with a person with leprosy and that they should be allowed to join activities at work, church, and in the community. Sixty-three percent felt that it was okay to share their workplace with a person with leprosy. This is possibly because most of our respondents knew that brief interactions with patients do not lead to transmission. More than 90% would disclose their condition to family and friends and would seek medical care if they were diagnosed with leprosy.

Fewer respondents in our study had positive attitudes in terms of sharing their living space (60%) and marrying a person with leprosy (55%). Although 88% felt that their relationship will remain the same, only 51% felt that their sexual relationship will remain the same if they found out that their partner has leprosy. Notably, only 32% would use the same set of eating

**Table 4.** Knowledge on clinical manifestations and treatment of leprosy

	Frequency (%)
<i>Which part of the body is affected by leprosy?</i>	
<b>Skin</b>	<b>243 (91.7%)</b>
<b>Hands and feet</b>	<b>127 (47.9%)</b>
<b>Nerves</b>	<b>95 (35.8%)</b>
<b>Eyes</b>	<b>59 (22.3%)</b>
Lungs	18 (6.8%)
Bones	13 (4.9%)
Kidney	12 (4.5%)
Brain	11 (4.2%)
Liver	3 (1.1%)
I don't know	5 (1.9%)
<i>Is leprosy curable?</i>	
<b>Yes</b>	<b>245 (92.5%)</b>
No	7 (2.6%)
I don't know	13 (4.9%)
<i>Is treatment for leprosy available in Rizal Medical Center for free?</i>	
<b>Yes</b>	<b>172 (64.9%)</b>
No	12 (4.5%)
I don't know	81 (30.6%)

utensils used by a person with leprosy. These negative attitudes concerning sexual relationship and sharing the same set of eating utensils with a person affected with leprosy are possibly because most of our respondents thought that leprosy is transmitted through body fluids and secretions, which include semen, vaginal discharge, and saliva.

Our findings show that despite their adequate knowledge on leprosy, our respondents still had misconceptions and knowledge gaps. These are centered mainly on the mode of transmission and transmissibility of leprosy from a patient who is undergoing treatment or has completed treatment. These can lead to inappropriate fear of transmission, which may be exemplified by our respondents' attitudes concerning sexual relationships and sharing the same set of eating utensils with a person affected with leprosy. It may also lead to unnecessary precautions (such as double gloving, unnecessary quarantine) that are stigmatizing behaviors.<sup>15</sup> This fear of transmission is one of the main causes of the stigma associated with leprosy.<sup>7,22</sup> Our future awareness campaigns should therefore address these misconceptions by emphasizing that leprosy is transmitted through inhalation and that patients who are on treatment can no longer transmit the disease.

Studies done in other countries showed that other HCWs had different beliefs and misconceptions on leprosy. Some associated leprosy with dirtiness,<sup>17</sup> while others believed that the disease spreads easily and can be transmitted through casual contact.<sup>9,23</sup> Other HCWs thought that the disease is incurable.<sup>17</sup> This highlights the importance of identifying locally relevant misconceptions and knowledge gaps to be able to design and implement more effective awareness programs.

### Strengths and limitations

Although this is a single-center study, to our knowledge, this is the only study investigating the knowledge and attitudes on leprosy of HCWs in NCR, Philippines, in the last 15 years.

**Table 5.** Attitudes toward persons with leprosy

	Frequency (%)
<i>It is okay to shake hands with a person with leprosy.</i>	
Strongly agree	74 (27.9%)
Agree	122 (46.0%)
No opinion	24 (9.1%)
Disagree	40 (15.1%)
Strongly disagree	5 (1.9%)
<i>It is okay to sit beside a person with leprosy.</i>	
Strongly agree	67 (25.3%)
Agree	136 (51.3%)
No opinion	28 (10.6%)
Disagree	28 (10.6%)
Strongly disagree	6 (2.3%)
<i>A person with leprosy should be allowed to join activities at work, church and in the community like everyone else.</i>	
Strongly agree	93 (35.1%)
Agree	117 (44.2%)
No opinion	30 (11.3%)
Disagree	23 (8.7%)
Strongly disagree	2 (0.8%)
<i>A person with leprosy should be given the same employment opportunities as everyone else.</i>	
Strongly agree	103 (38.9%)
Agree	112 (42.3%)
No opinion	31 (11.7%)
Disagree	16 (6.0%)
Strongly disagree	3 (1.1%)
<i>If I know someone who probably has leprosy, I would encourage him/her to seek consultation.</i>	
Strongly agree	224 (84.5%)
Agree	37 (14.0%)
No opinion	3 (1.1%)
Disagree	1 (0.4%)
Strongly disagree	0 (0.0%)
<i>It is okay to share my workplace with a person with leprosy.</i>	
Strongly agree	68 (25.7%)
Agree	98 (37.0%)
No opinion	47 (17.7%)
Disagree	44 (16.6%)
Strongly disagree	7 (2.6%)
<i>It is okay to share my living space with a person with leprosy.</i>	
Strongly agree	62 (23.4%)
Agree	97 (36.6%)
No opinion	41 (15.5%)
Disagree	53 (20.0%)
Strongly disagree	11 (4.2%)
<i>It is okay to use the same set of eating utensils used by a person with leprosy.</i>	
Strongly agree	37 (14.0%)
Agree	48 (18.1%)
No opinion	45 (17.0%)
Disagree	98 (37.0%)
Strongly disagree	37 (14.0%)

**Table 5.** (Continued)

	Frequency (%)
<i>It is okay for me to marry a person with leprosy.</i>	
Strongly agree	62 (23.4%)
Agree	83 (31.3%)
No opinion	71 (26.8%)
Disagree	42 (15.8%)
Strongly disagree	6 (2.3%)
<i>If I found out that my partner (husband/wife/boyfriend/girlfriend) has leprosy, our relationship will remain the same.</i>	
Strongly agree	147 (55.5%)
Agree	85 (32.1%)
No opinion	21 (7.9%)
Disagree	11 (4.2%)
Strongly disagree	1 (0.4%)
<i>If I found out that my husband/wife has leprosy, our sexual relationship will remain the same.</i>	
Strongly agree	69 (26.0%)
Agree	65 (24.5%)
No opinion	54 (20.4%)
Disagree	67 (25.3%)
Strongly disagree	10 (3.8%)

Therefore, it provides information on the drivers of stigma in our setting. Our study did not include practices since not all HCWs in RMC provide direct medical care to patients with leprosy. Because this is a descriptive cross-sectional study, we cannot investigate associations between variables; instead, we only hypothesized possible associations between knowledge and attitudes.

## Recommendations

To make the results more generalizable, we recommend that similar studies be done in different primary, secondary, and tertiary healthcare institutions in NCR. We recommend designing behavior change communication (BCC) strategy based on our findings. Previous efforts have been centered on information dissemination with most participants from the medical and nursing divisions; we therefore propose the intentional involvement of the non-clinical divisions as a stigmatizing encounter may occur at any point during a healthcare institution visit.<sup>15</sup> In our setting, we plan to involve the institution's working community, as well as people living with leprosy, in generating locally acceptable stigma reduction interventions and institutional policies during a community workshop. The generated interventions can then be implemented as a pilot study. Monitoring studies should be done to evaluate the effectiveness, longevity, and sustainability of this BCC strategy.

We recommend that further studies explore if demographic characteristics such as age, educational background, and years in practice affect the HCWs' knowledge, attitudes, and practices. It may also be of value to examine how cognizant HCWs are of potentially stigmatizing attitudes and practices, as well as how institutional policy can affect these. To gain more understanding of the stigma associated with leprosy, further studies should explore the perspectives of persons affected with leprosy and their families.

**Table 6.** Attitudes toward self if diagnosed with leprosy

	Frequency (%)
<i>I would still have self-confidence even if I were diagnosed with leprosy.</i>	
Strongly agree	73 (27.5%)
Agree	81 (30.6%)
No opinion	41 (15.5%)
Disagree	59 (22.3%)
Strongly disagree	11 (4.2%)
<i>I would tell my family and close friends if I were diagnosed with leprosy.</i>	
Strongly agree	208 (78.5%)
Agree	35 (13.2%)
No opinion	5 (1.9%)
Disagree	16 (6.0%)
Strongly disagree	0 (0.0%)
<i>I would seek consult and undergo treatment if I were diagnosed with leprosy.</i>	
Strongly agree	237 (89.4%)
Agree	26 (9.8%)
No opinion	2 (0.8%)
Disagree	0 (0.0%)
Strongly disagree	0 (0.0%)
<i>I would seek treatment at a health care institution near my place of residence if I were diagnosed with leprosy.</i>	
Strongly agree	213 (80.4%)
Agree	43 (16.2%)
No opinion	3 (1.1%)
Disagree	6 (2.3%)
No	0 (0.0%)
<i>I would join leprosy awareness campaigns and support groups if I were diagnosed with leprosy.</i>	
Strongly agree	188 (70.9%)
Agree	61 (23.0%)
No opinion	12 (4.5%)
Disagree	3 (1.1%)
Strongly disagree	1 (0.4%)

## Conclusion

Our findings show that the majority of HCWs in RMC had either high or medium knowledge about leprosy and a positive attitude towards leprosy. However, we have identified misconceptions and knowledge gaps centered on the transmission and transmissibility of leprosy which should be addressed in our future leprosy awareness campaigns.

## Ethical review

This study was approved by the Rizal Medical Center Institutional Review Board (2019-D-#26-RP-3.1).

## Conflict of interest

AAV-T is the Head of the Philippine Dermatological Society Leprosy Subspecialty Core Group; is the Project Lead for Leprosy Clinical Practice Guidelines, a project of the Department of Health, International Leprosy Association and Cullion Foundation; and was previously employed for research work on leprosy funded by Novartis Foundation. MHPL was previously

employed for research work on leprosy funded by Novartis Foundation. CPC, CEEdG and MJBT declare no conflict of interest.

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## Author contributions

CPC is the guarantor and was involved in the conceptualization, study design, formal analysis, writing the original draft, review and editing of the manuscript, supervision, and project administration.

MHPL was involved in the conceptualization, data collection, formal analysis, writing the original draft, and review and editing of the manuscript.

CEEdG was involved in the conceptualization, data collection, provision of resources, writing the original draft, and review and editing of the manuscript.

MJBT was involved in the conceptualization, data collection, and review and editing of the manuscript.

AAV-T was involved in the conceptualization, review and editing of the manuscript, supervision, and funding acquisition.

## Consent from participants

All participants signed an informed consent form before answering the questionnaire.

## Data availability

The datasets generated during the current study are available from the corresponding author on reasonable request.

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