Knowledge, Attitudes, and Practices of Barangay Health Workers in Marawi City regarding Hansen's Disease

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ABSTRACT

Objective. To assess the knowledge, attitudes, and practices of Barangay Health Workers (BHWs) in Marawi City regarding Hansen's Disease (HD).

Methods. A cross-sectional study was conducted among the Barangay Health Workers of Marawi City. This study was conducted in two phases. Phase 1 was questionnaire development where the knowledge, attitudes, and practices (KAP) questionnaire was formulated and administered to six Barangay Health Workers for pre-testing. Phase 2 of the study included the survey and focus group discussion (FGD). A questionnaire comprising of 27 questions was administered to BHWs to assess knowledge, attitude, and practices regarding HD.

Results. A total of 49 BHWs underwent the Phase 2 survey and six BHWs joined the FGD. The mean age of all the survey participants was 34.9 ± 19.3 years. Among the 49 participants, 40 (81.6%) were females. The knowledge of BHWs was found to be adequate only in six (12%) BHWs. Positive attitude was observed in 12 (24.5%) and adequate practices regarding HD were observed in 33 (67.3%) BHWs. First-hand experience of diagnosing HD patients was significantly associated with adequate knowledge ($p < 0.001$) and positive attitude of BHWs ($p < 0.001$). There was a significant association between > 5 years of experience as BHWs ($p = 0.027$) and first-hand experience in diagnosing leprosy ($p = 0.005$) with adequate practices of BHWs regarding HD. In the FGD, BHWs expressed their lack of training which highlighted the need for refresher courses on HD.

Conclusions. Knowledge about HD is low among Marawi BHWs due to their inadequate training. The attitudes and practices of BHWs are also affected because of deficient knowledge regarding etiology and transmission of HD. There is a need for adequate training and refresher courses on HD to increase the knowledge of BHWs regarding HD.

Keywords: Hansen's disease, leprosy, knowledge, attitudes, practices, healthcare workers, social stigma

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INTRODUCTION

Leprosy, also known as Hansen's Disease (HD) named after the Norwegian scientist, Gerhard-Henrik Armauer Hansen, who discovered *Mycobacterium leprae* in 1873, is deemed alarming by most people due to its reputation to cause deformities and disabilities.[1] It is associated with an immense level of stigmatization and psychosocial suffering.[2] It is caused by *Mycobacterium leprae,* an acid-fast, rod-shaped bacillus with a slow growth rate.[3] It mainly affects the skin, peripheral nerves, mucosa of the upper respiratory tract and eyes.[4] The introduction of Chaulmoogra oil injections in early twentieth century, followed by Promin, a sulphone antibiotic, in the 1940's, Dapsone in 1950's and the revolutionary Multi-Drug Therapy (MDT) in the 1980's, has changed the course of disease altogether.[5,6]

According to the World Health Organization (WHO), elimination of HD was achieved globally in the year 2000. Elimination is defined by WHO as an incidence of less than 1 per 10,000 population.[7,8] Currently it is included in the neglected tropical disease (NTD) list and still occurs in more than 120 countries of the world with more than 200,000 cases, annually.[7] From 2006 to 2010, the global strategy to further reduce the burden of HD was through sustained leprosy control activities. By 2010, HD was regarded as eliminated from 34 countries of the Western Pacific region but cases from the Philippines and China still constitute the majority of new multibacillary cases detected in the region. In 2019, the Philippines was the sole major contributor of HD cases in the region (2,122 cases) followed by China (748 cases) and Papua New Guinea (457 cases).[9] The country's National Leprosy Control Program (NLCP) has helped in bringing the incidence rate of HD from 7.2 (per 10,000 population) in 1986 to a current level of <1 (per 10,000 population).[10] This was achieved through the nationwide implementation of MDT, *Kilatis Kutis Campaign* and household/school screening information drives done by the Department of Health (DOH) together with non-government organizations.[11] Despite these efforts, the Philippines still remains the country with the highest prevalence of HD in the Western Pacific region.

Marawi City is the capital city of the province of Lanao del Sur in Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) region. Located in BARMM, the inaccessibility of the area due to armed conflicts in the surrounding provinces, contributed to the city's relatively poor health status.[12] There are concerns with safe drinking water, toilets, electricity, medical staff shortage, and fewer health facilities.[13,14] It has 96 barangays but reports show that only 15 Barangay Health Centers (BHC) were functioning after the 5-month long armed conflict in Marawi in 2017.[15] The inadequacy of healthcare facilities may be a factor as to why Marawi is one of the cities with high incidence of HD. The Barangay Health Workers (BHWs) working in functioning BHCs have to cater to other barangays without BHCs. Since its formulation in 1986, NLCP has been involved in training medical staff for management of HD. Serving as medical frontliners, the staff of BHCs are the first health workers that HD patients consult. It is therefore relevant to assess their level of knowledge, attitudes, and practices (KAP) regarding HD.

A KAP study conducted in Pasig City, Philippines showed that although majority of the healthcare workers had good knowledge and positive attitude, there were still some misconceptions and knowledge lapses regarding the transmission and management of HD.[16] It is worth noting that the situation in the conflict-ridden city of Marawi may altogether be different. For the BHWs in Marawi, especially the volunteers who are neither nurses nor midwives, their level of knowledge regarding HD could be a factor in determining their type of response to training under leprosy control program. It is therefore, essential to first assess the level of knowledge, attitude, and practices among the healthcare workers of Marawi region so as to have an understanding of the current situation before formulating further strategies for the control of HD.

There are issues and challenges at the primary level, as presented by NLCP, such as: a) failure to reach endemic areas, b) inaccessibility of some endemic areas due to geographic and security situations, c) incomplete recording, d) over-diagnosis of multibacillary cases or under diagnosis of paucibacillary cases, e) under-reporting of children and female leprosy cases due to incomplete documentation of age, sex, and clinical classification, and f) lack of efficient referral system.[17] These issues were addressed by this study by integration into the KAP questionnaire. The aim of the study was to assess the knowledge, attitude, and practices of healthcare workers of Marawi City regarding Hansen's Disease.

METHODS

A cross-sectional study was conducted in June 2016 to September 2017 after obtaining ethical approval from the University of the Philippines Manila Ethics Board (code # OBG 2017-355-01). The study was conducted in two phases. Phase one involved questionnaire development and phase two involved a cross-sectional survey and focus group discussion (FGD).

First phase: Questionnaire Development

The questionnaire was adapted from the study done by Subramaniam et al., on the community knowledge, beliefs, and attitudes on leprosy in Ang Mo Kio, Singapore.[18] Dermatologists were consulted regarding its content. The questionnaire comprised of 27 questions, the first 14 questions were related to knowledge followed by eight statements for attitude and five for practices. A key of correct answers was designed for knowledge questions. Attitude and practices were rated on Likert scales ranging from 1- 4 ("1" referred to lower level of attitude/practices and "4" referred to higher level of attitude/practices). Positive attitude and adequate practices were depicted by a higher score (agree / strongly agree). The questionnaire was then pre-tested on six BHWs and their suggestions were incorporated into the questionnaire before being employed for the main survey. The questionnaire was made available in both English and Filipino, and the participants were provided the option to select their preferred language.

Second phase: Survey and Focus Group Discussion

The participants for the main survey were enrolled through non-probability convenience sampling technique. Invitations were sent to all the 155 Marawi BHWs, through their chief BHW. However, only 49 of the 155 arrived and these enrolled participants signed the informed consent. Due to the current state of recent war in Marawi, survey

meeting was done in Iligan City, a neighboring city nearest to Marawi City. All 49 answered the survey questionnaire.

The FGD was conducted personally by the primary investigator (Figure 1). Six BHWs from the 49 BHWs who arrived were invited to the FGD. We divided the 49 BHWs into two groups, according to years of experience as BHW. Three participants from each category were then chosen by draw lots. The scheme of questionnaire development and data collection is shown in Figure 2.

RESULTS

Demographic profile of study participants

A total of 155 Marawi BHWs were invited to participate in the study. However, only 49 volunteered to participate, giving a response rate of 31.6%. The mean age of the participants was 34.9 ± 19.3 years. Among the 49 participants, 40 (81.6%) were females. Majority were married (57%), and all of them were Muslims. Thirty-two of them (65.2%) had been serving as BHWs for more than five years, yet most of them have remained on volunteer status (89.8%). A volunteer status means that the BHW does not have a permanent government tenure and income depends on the amount given by the barangay chairman of the locality. Many of the participants (40.8%) had very low family monthly income of less than 8,000 pesos. None of the participants had been diagnosed with leprosy or had a family/household member diagnosed with leprosy. Twelve (24.5%) had reported detecting and diagnosing leprosy first-hand. The demographic details of the study participants are shown in Table 1.

Knowledge of Marawi BHWs

Fourteen questions were included in the survey to assess the knowledge of the study participants regarding

Figure 1. Primary Investigator with the participants of FGD.

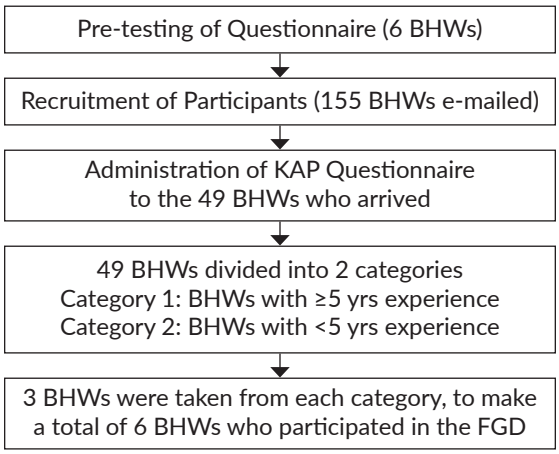

Figure 2. Conduct of data collection.

Table 1. Profile of Study Participants (N=49)

Demographic Factors	Categories	n (%)
Age	18-30 years	12 (24.5)
	31-40 years	15 (30.6)
	≥41 years	22 (44.9)
Sex	Male	9 (18.4)
	Female	40 (81.6)
Civil status	Single	16 (32.6)
	Married	28 (57.1)
	Separated	1 (2.0)
	Widow(er)	4 (8.1)
Religion	Islam	49 (100)
Education	High school graduate	10 (20.4)
	College graduate	38 (77.6)
	Post-graduate/Masters	1 (2.0)
Type of employment	Permanent	3 (6.1)
	Contractual/Casual	2 (4.1)
	Volunteer	44 (89.8)
Monthly total family income (PhP)	>100,000	6 (12.2)
	30,000-50,000	5 (10.2)
	15,000-30,000	11 (22.5)
	8,000-15,000	7 (14.3)
	<8,000	20 (40.8)
Years working as BHW	>10 years	7 (14.3)
	8-10 years	9 (18.3)
	5- <8 years	16 (32.6)
	3- <5 years	8 (16.3)
	1- <3 years	4 (8.2)
	<1 year	5 (10.2)
Experience with leprosy cases		
"Have you ever been diagnosed with leprosy?"	No	49 (100)
	Yes	0 (0)
Has any household/family member been diagnosed with leprosy?	No	49 (100)
	Yes	0 (0)
Have you ever detected or diagnosed leprosy since you worked as a BHW?	No	37 (75.5)
	Yes	12 (24.5)

HD. Only 27 (55%) participants knew the etiologic cause of HD and 22 (45%) considered HD to be incurable. Eleven (22%) correctly knew how HD is transmitted. The diagnostic criteria of HD were correctly answered by only 23 (47%) participants. When knowledge was assessed as a whole, only 6 (12.2%) participants answered ≥75% of the questions correctly and were labeled to have adequate knowledge about HD. Table 2 shows the number of BHWs who were able to provide the right answers to specific knowledge questions.

Attitudes of Marawi BHWs

The results showed that 27 (55.1%) participants agreed or strongly agreed to the statement that persons with HD should not be avoided. Regarding the statement about feeling disgusted if a friend/colleague is afflicted with HD, 34 (69.4%) agreed or strongly agreed that they should not feel disgusted. On the statement about fearing for one's own health if a family member is afflicted with leprosy, 39 (79.6%) agreed or strongly agreed that they should not fear. When asked about the willingness to sit beside an HD patient, 30 (61.2%) agreed or strongly agreed that they are willing to sit beside an HD patient. Overall, positive attitude (agree/strongly agree on ≥75% statements) was present only in 12 (24.5%) BHWs. Table 3 shows the attitude towards HD of Marawi BHWs.

Practices of Marawi BHWs towards HD

The results of the survey showed that 37 (75.5%) participants were, either sometimes or always, following the practice of doing skin check-up even if the patient's complaint was not related to skin. Twenty-five (51%) participants were either sometimes or always, filling out the patient's record

Table 2. Knowledge on Hansen's Disease of Marawi City BHWs (N=49)

Knowledge Question (KQ)		n (%)
KQ 1	Etiologic cause of Hansen's Disease/Leprosy.	27 (55)
KQ 2	True or false: Hansen's Disease is not curable.	22 (45)
KQ 3	How is HD transmitted?	11 (22)
KQ 4	Which of the following is included in the 3 criteria to diagnose HD? Choose 1 answer only.	23 (47)
KQ 5	What is the treatment for Hansen's Disease?	15 (31)
KQ 6	How many skin lesions should a patient have to diagnose Paucibacillary Hansen's Disease?	14 (28)
KQ 7	How many skin lesions should a patient have to diagnose Multibacillary Hansen's Disease?	14 (29)
KQ 8	What is the drug of choice and dose for post-exposure prophylaxis for adults for Hansen's Disease?	18 (37)
KQ 9	What is done to prevent spread of Hansen's Disease?	32 (65)
KQ 10	Which of the following is characteristic of the type 1 Lepra Reaction of Hansen's Disease?	28 (57)
KQ 11	Which of the following is characteristic of the type 2 Lepra Reaction of Hansen's Disease?	12 (24)
KQ 12	What are the common complications (deformities) of Hansen's Disease?	26 (53)
KQ 13	What is the rehabilitation management for foot drop in Hansen's Disease?	7 (14)
KQ 14	Aside from physical deformities, what else should be addressed in management of patients with Hansen's Disease?	28 (57)

Table 3. Attitude towards Hansen's Disease (HD) of Marawi BHWs (N = 49)

Attitudes		Mean + SD	Responses of BHWs, n (%)			
			1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree
A1	Not avoiding a person afflicted with HD.	2.6 ± 1.0	10 (20)	12 (24)	16 (33)	11 (22)
A2	Not feeling disgust if a friend or colleague is afflicted with Hansen's Disease.	2.6 ± 1.0	10 (20)	5 (10)	29 (59)	5 (10)
A3	No feeling of fear for one's own health if a family member is afflicted with leprosy.	2.8 ± 0.8	4 (8)	6 (12)	32 (65)	7 (14)
A4	Willingness to sit beside a leprosy patient.	2.6 ± 0.7	4 (8)	15 (31)	29 (59)	1 (2)
A5	Willingness to shake the hands of a person with HD.	2.4 ± 0.8	6 (12)	18 (37)	22 (49)	3 (6)
A6	Willingness to buy food being sold by HD patient.	2.3 ± 0.7	5 (10)	26 (53)	16 (33)	2 (4)
A7	Willingness to work in same room with a HD patient.	2.4 ± 0.7	4 (8)	24 (49)	18 (36)	3 (6)
A8	Advising suspected Hansen's patient to seek medical attention in my local BHC for prompt proper work-up and management.	3.3 ± 0.5	0 (0)	1 (2)	30 (61)	18 (37)
	Total	2.6 ± 0.4				

fully and completely including the age, sex, and clinical HD classification. Proper referral of a HD suspect to Health Center Nurse, if unsure about clinical classification, was practiced by 39 (79.6%) participants. Overall, adequate practices (sometime/always response to ≥75% statements) were observed in 33 (67.3%) BHWs. The details of practices of Marawi BHWs towards HD are depicted in Table 4.

Factors associated with Knowledge, Attitudes, and Practices of Marawi BHWs

Association of knowledge, attitude, and practices with various demographic and baseline characteristics of participants such as age, educational status, years of experience as BHW, and experience in diagnosing leprosy first-hand was studied. Age, educational status, and years of experience were not associated with level of knowledge. First-hand experience with leprosy was associated with level of knowledge (p <0.001) (Table 5). The association of these demographic and baseline characteristics with attitude of BHWs showed that first-hand experience of diagnosing HD patients was significantly associated with the attitude of the BHWs (p <0.001). No statistically significant association was observed between age, level of education, and experience with the attitudes of BHWs towards HD (Table 6). The association of these parameters with practices of BHWs regarding HD showed that there was a significant association of more than five years of experience as BHWs (p = 0.027) and first-hand experience of leprosy (p = 0.005) with adequate practices of BHWs regarding HD (Table 7).

Results from Focus Group Discussions

All the FGD participants believed that more training was needed to enable BHWs to properly detect HD. They admitted that most of the BHWs lack knowledge about HD and expressed an immediate need for further training. It was observed that participants believe that mode of transmission of HD was not clearly understood by many BHWs. Although the BHWs were afraid of getting HD, they continued to manage their HD patients since they considered themselves frontline health workers. The BHWs also expressed their willingness to work on projects for their local community. The barriers and limitations in managing HD patients at BHC were also highlighted. Table 8 shows the themes and sub-themes from the FGDs.

Table 4. Practices on Hansen's Disease of Marawi BHWs (HD) (N = 49)

	Practices	Mean ± SD	Responses of BHWs			
			1 Never	2 Rarely	3 Sometimes	4 Always
P1	Constant practice to do skin check-up even if patient's complaint is not on the skin.	3.0 ± 1.0	7 (14)	5 (10)	18 (37)	19 (38)
P2	Filling out of the patient's record fully and completely including the age, sex, and clinical HD classification.	2.4 ± 1.5	24 (49)	0 (0)	2 (4)	23 (47)
P3	Proper referral of a HD suspect to Health Center Nurse if unsure of clinical classification.	3.4 ± 1.0	4 (8)	6 (12)	5 (10)	34 (69)
P4	Proper referral to City Health Office if medicines are not available in BHC.	3.9 ± 0.4	0 (0)	2 (4)	1 (2)	46 (94)
P5	Proper practice of wearing protective mask and gloves when examining HD suspect patient.	3.8 ± 0.7	2 (4)	1 (2)	3 (6)	43 (88)
	Total	3.3 ± 0.5				

Table 5. Association of Level of Knowledge of Marawi BHWs with Age, Educational Status, Years of Experience, and First-hand Experience with HD Diagnosis

Variables		Score on Knowledge		*p*-value
		Low Score (<75%) N=43, n (%)	High Score (≥75%) N=6, n (%)	
Age	<40 years (n=27)	25 (58.1)	2 (33.3)	0.388†
	≥40 years (n=22)	18 (41.9)	4 (66.7)	
Educational level	College and post-grad (n=39)	33 (76.7)	6 (100)	0.324†
	High school grad and elementary (n=10)	10 (23.3)	0 (0)	
Years of experience	≥5 years (n=32)	26 (60.5)	6 (100)	0.080†
	<5 years (n=17)	17 (39.5)	0 (0)	
First-hand experience to diagnose leprosy	With experience (n=12)	6 (14)	6 (100)	<0.001*†
	Without experience (n=37)	37 (86)	0 (0)	

** Significant association was found; † Fisher's Exact test was applied where expected cell count in more than 20% of the cells was less than 5*

Table 6. Association of Level of Attitude of Marawi BHWs with Age, Educational Status, Years of Experience, and First-hand Experience with HD Diagnosis

Variables		Score on Attitudes		*p*-value
		Low Score (<75%) N=37, n (%)	High Score (≥75%) N=12, n (%)	
Age	<40 years (n=27)	21 (57.8)	6 (50)	0.683[a]
	≥40 years (n=22)	16 (43.2)	6 (50)	
Educational Level	College and post-grad (n=39)	8 (21.6)	2 (16.7)	0.711[†]
	High school grad and elementary (n=10)	29 (78.4)	10 (83.3)	
Years of Experience	≥5 years (n=32)	13 (35.1)	4 (33.3)	1.000[†]
	<5 years (n=17)	24 (64.9)	8 (66.7)	
First-hand experience to diagnose Leprosy	With experience (n=12)	33 (89.2)	4 (33.3)	<0.001*[†]
	Without experience (n=37)	4 (10.8)	8 (66.7)	

** Significant association was found; [a] Chi square test was applied; [†] Fisher's Exact test was applied where expected cell count in more than 20% of the cells was less than 5*

Table 7. Association of Level of Practices of Marawi BHWs with Age, Educational Status, Years of Experience, and First-hand Experience with HD Diagnosis

Variables		Score on Practices		*p*-value
		Low Score (<75%) N=16, n (%)	High Score (≥75%) N=33, n (%)	
Age	<40 years (n=27)	11 (68.8)	16 (48.5)	0.181[a]
	≥40 years (n=22)	5 (31.2)	17 (51.5)	
Educational Level	College and post-grad (n=39)	6 (37.5)	4 (12)	0.060[†]
	High school grad and elementary (n=10)	10 (62.5)	29 (88)	
Years of Experience	≥5 years (n=32)	9 (56.2)	8 (24.2)	0.027*[a]
	<5 years (n=17)	7 (43.8)	25 (75.8)	
First-hand experience to diagnose Leprosy	With experience (n=12)	16 (100)	21 (64)	0.005*[†]
	Without experience (n=37)	0 (0)	12 (36)	

** Significant association was found; [a] Chi square test was applied; [†] Fisher's Exact test was applied where expected cell count in more than 20% of the cells was less than 5*

Table 8. Themes and Sub-themes from Focus Group Discussions on BHWs of Marawi City

Themes	Sub-themes
Further training is needed	Immediate need for training
	Refresher courses on Kilatis Kutis campaign
	BHWs forgot or lack basic information on HD
	BHWs in other cities are being trained by NLC
Fear of infection	Feelings of fear still persist
	Means of transmission of HD not clearly understood
	Concept that skin to skin transmission occurs
Management of HD patient	As they are first line workers they have to manage HD patients despite fear
	Refer straight away to nurse or physicians as BHWs think they lack knowledge
	Many of the nurses and physicians are also not trained in management of HD
BHWs are willing to cooperate on any project for local population	Most BHWs are volunteers with passion for work and helping their community
	Do not receive adequate salaries, yet they perform duties
	Despite their willingness, BHWs were never invited for any training by DOH/NLCP
Lack of medicine and manpower	Patients often do not come back due to delays and lack of medications
	Lack of knowledge on alternate medicines for HD
	Lack of budgetary support from barangay captains

DISCUSSION

The results from the current study show that the knowledge of BHWs regarding HD was generally poor. Only around 12% of the participants were able to answer 75% of the questions correctly. The knowledge about etiological aspects and transmission of HD was very low among BHWs. A study conducted in Bogra and Moulvibazar districts of Bangladesh showed that healthcare workers had a very poor knowledge (11%) about HD. However, after implementation of the Health System Strengthening (HSS) project, their knowledge increased significantly (88%), thus signifying the importance of capacity building programs.[19] A study from Fatehpur, India, on the knowledge of patients, community members, and healthcare workers regarding HD showed that, although the healthcare workers had better knowledge than other participants, their knowledge was deficient in many aspects of HD, particularly on etiology and transmission.[20] In contrast to these studies, a study from a tertiary hospital in Pasig city showed that majority (almost 70%) of the healthcare workers had adequate knowledge about HD. The authors believed that this higher level of knowledge among the healthcare workers was due to stigma elimination campaigns conducted in collaboration with NLCP.[16] Thus, it may be assumed that the knowledge of healthcare workers differs from region to region, the level of healthcare setting (primary/tertiary), and participation in training programs on HD.

The participants from the focus group discussion admitted their inadequate knowledge regarding HD. When asked about the reasons, they attributed this to lack of training for the DOH *Kilatis Kutis Campaign* (KKC).[11] The KKC program of the NLCP (by the DOH) trains all BHWs on how to conduct cutaneous examination of patients who come in for skin disease consultation and to identify possible leprosy suspects for immediate treatment at the barangay level. Only a few of the BHWs who worked for more than 5 years, were able to train in the KKC and some of those trained in the KKC have already resigned. The few who have remained need to undergo refresher courses. This was obvious from the results of the study as most of them attained very low scores especially in knowledge on HD.

Almost 25% of the participants were not afraid that they will get infected after exposure to leprosy patients. A study from West Bengal, India, showed that there was an immense level of attitudinal crises and stigma related to HD among the patients (46%), relatives (57%), and healthcare providers (33%). The high level of negative attitude among the healthcare providers was believed to be due to lack of training and belief in various myths.[21] Similar results were also observed in a study from Colombo, Sri Lanka, where almost one-fifth of the healthcare providers believed in casual skin to skin transmission, almost 35% admitted to their fear of HD, and 43% did not want to publicly reveal if one of their family members get infected with HD. The authors suggested refresher courses to fill the knowledge gap and rectify the myths.[22]

The results from the FGD showed that the participants were afraid that they can get infected by their patients. They attributed this to lack of proper knowledge about modes of transmission and a widely observed myth that skin to skin transmission can occur. A systematic review of 21 articles from various HD endemic countries showed that the fear of transmission of HD is very common among healthcare workers.[23] It was common for the healthcare workers to avoid HD patients. The attitudes varied between region to region, where the mean attitude scores were lowest in an Indonesian study[24] and highest in a study from Thailand.[25] These attitudes were found to be influenced by the perceptions of fear, considering HD a taboo or even regarding HD patients as witches or those who are ostracized. The authors of the review concluded that the attitudes of healthcare workers are dependent on their level of training, years of experience, their knowledge about HD, and the presence of stigmas and myths in the mind of healthcare workers.[23] The presence of stigma is understandable as it is the result of decades of discrimination of leprosy patients mainly due to the segregation and confinement in leprosarium in the past.[26] The possible solution to this is inculcating in the minds of the people, starting from their childhood, that leprosy is a curable disease and that segregation is not necessary due to availability of effective treatment.

The practices of BHWs regarding HD were assessed through five questions. The results showed that majority of the BHWs (67%) were following adequate practices. These practices included routine skin checkups in those without complaints related to skin, maintaining clinical record, and following proper referral system. Similar results were observed in a study from sub-Saharan Africa where 60% of healthcare workers accepted working with HD patients and 80% accepted living with them.[27] In contrast to these studies, a study from Oromia Region State of Ethiopia showed that less than 7% of the healthcare workers were observing adequate practices in managing HD patients. The authors linked the presence of inadequate practices to the lack of knowledge and organized training of healthcare workers regarding HD.[28] Thus, it is understandable that the knowledge, attitudes, and practices of healthcare workers differ from region to region and from one level of healthcare facility to another. Most of the authors in the above-mentioned studies have pointed out that organized training was the most efficient way to enhance the knowledge and skills, and change the perceptions of healthcare workers regarding HD.

Although the authors have tried to limit bias and structural weaknesses of the study through careful selection of methodological aspects of the research, nonetheless, there were various limitations of the study. There was a low response rate for inclusion into the study. The knowledge, attitude, and practices of the BHWs that were not included could not be assessed. Due to low response rate, the sample

size was also relatively small. A possible implication of this in data analysis was the high degree of uncertainty in finding out the associations of various demographic characteristic with the outcomes due to zero count in one or more cells. Additionally, the sample was taken from one city, which was conflict ridden, the situation elsewhere in the country may be altogether different. There may also be differences in comparison with tertiary care hospitals of the country. For these reasons, generalizability of the results may not be possible. The FGD was performed to augment the results of the survey and to have an overview of the perceptions of BHWs regarding HD. A smaller sample size was thus selected. However, the authors recommended FGD on a larger cohort for in-depth analysis of the perception of BHWs. It may also be worthwhile to include doctors, nurses and other paramedical staff in future studies. The authors recommended conducting further studies in other regions of the country to get a holistic view of the current situation of knowledge, attitude, and practices of BHWs regarding HD.

CONCLUSION

Knowledge of Marawi BHWs is low due to inadequate training of the relatively newer BHWs. Their practices and attitudes are affected due to inadequacy of knowledge regarding etiology and modes of transmission of HD thus leading to fear of transmission. The BHWs are willing to enhance their knowledge and skills related to management of HD patients and to participate in projects for their local population but there are currently no training courses being offered to them. These issues can be addressed by adequate and proper training of those involved in the delivery of leprosy-related services including physicians, nurses, midwives, and BHWs. Recommendations to the local government unit (Marawi City, City Health Office) include allocation of budget for training, increasing the sphere of *Kilatis Kutis Campaign*, and to possibly incorporate educational campaigns on HD among the schools starting from elementary, high school, and college, in order to enhance the awareness of HD at the community level, with a deliberate focus on addressing HD-related stigma and discrimination. Recommendations for health service providers in Marawi are to arrange refresher courses on HD and proper referral system in coordination with the local barangay health centers and city health office. Following these measures can help in curtailing the high incidence of HD in Marawi City. These measures can serve as a guide not only for other cities in the Philippines but also other countries where HD is endemic.

Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

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