The Feasibility of Using Telehealth for Training Health Care Workers and Persons with Disability on Integrated Rehabilitation and Prevention of Impairments and Disabilities of Leprosy, Lymphatic Filariasis, Diabetes, Pressure Ulcers, and Other Chronic Wounds (TeleRPOID Project)

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ABSTRACT

Background. The Philippines has the highest number of new leprosy cases in the Western Pacific Region, with 1,000 to 2,000+ cases detected annually over the past decade. Out of 46 filariasis-endemic provinces in the country, 43 have eliminated lymphatic filariasis. However, many grade 2 disabilities acquired from these neglected tropical diseases (NTDs) remain undetected due to inadequate monitoring during and after treatment. This was further exacerbated by the detrimental impact of COVID-19 on healthcare access. The pandemic prompted initial adoption of teletraining, making a feasibility study necessary.



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Corresponding author: Belen Lardizabal-Dofitas, MD, MSc, PhD Department of Dermatology Philippine General Hospital University of the Philippines Manila Taft Avenue, Ermita, Manila 1000, Philippines Email: bldofitas@up.edu.ph ORCiD: https://orcid.org/0000-0001-5494-9455 **Objective.** This study aimed to determine the feasibility of using telehealth and distance learning to train healthcare workers and patients in the integrated rehabilitation and prevention of impairments and disabilities from leprosy, lymphatic filariasis, mycetoma, diabetes, pressure ulcers, and other chronic wounds.

Methods. Selected rural health units, patients with disabilities, and their caregivers in a leprosy- and lymphatic filariasis-endemic region were recruited. Municipal health officers and leprosy coordinators helped in the conceptualization, planning, implementation, and evaluation of the teletraining program to ensure its acceptability and utilization. Asynchronous and synchronous methods were used. The main reference was the "Ten Steps" guide. Training materials were shared via Google Drive and flash drives sent to each study site. One-day didactics and skills trainings were conducted through live-interactive sessions using online platforms (Zoom or Google Meet). Topics focused on nerve function assessment (for leprosy and diabetes), problems of mobility, lymphedema, wound care, and self-care. Participants practiced and demonstrated their skills on local patients, with mentoring through Messenger

chats. Knowledge and performance assessments were conducted.

Results. The study was conducted from 2021 to 2022 and the actual training implemented within four months of 2022. Two municipalities of Sultan Kudarat province, Mindanao Island group with one rural health unit (RHU) each had participated. All participants (N=16; eight RHU personnel and eight village health workers) attended the synchronous skills training, 12 (75%) submitted return demo videos, and 13 (81.25%) had practicum patients. All participants rated the training as successfully attaining objectives and activities. All were generally satisfied with the teletraining because of improved knowledge and skills gained and were willing to continue it. Efficiency, speed, quality of training, and trainers had high ratings. Teletraining was considered effective in improving the wound care of their patients. Patients were also satisfied with the home care. However, the unreliable internet service in the study sites created difficulties during synchronous sessions and negatively affected appropriateness of teletraining. Finding patients for practicum was challenging. Some supplies were not available in local drugstores and had to be shipped from Manila, raising costs. Overall, the rating of the teletraining was good.

Conclusion. Teletraining of health workers from distant health units on integrated disability prevention and care is feasible in terms of implementation, acceptability, and practicality if stable internet connectivity is available. Larger studies are recommended.

Keywords: telehealth, disabilities, integrated rehabilitation and prevention, leprosy, lymphatic filariasis, pressure ulcers, chronic wounds, diabetes, Skin Neglected Tropical Diseases

INTRODUCTION

Neglected Tropical Diseases (NTDs) continue to pose a significant public health burden in the Philippines, with ten NTDs remaining endemic in all 81 provinces.¹ Skin NTDs such as leprosy, lymphatic filariasis (LF), and mycetoma contribute to chronic disability, disfigurement, social stigma, and economic hardship.² Although the country has made substantial progress toward the elimination of these diseases through national programs and adherence to World Health Organization (WHO) guidelines since 2000,³ challenges persist in disability prevention, rehabilitation, and long-term patient support.

The Philippines reports the highest annual number of new leprosy cases in the Western Pacific Region, averaging 1,000 to 2,000 annually. Forty-three of forty-six LF-endemic provinces have achieved elimination status, yet cases of mycetoma remain underreported and poorly managed.¹ Despite ongoing efforts in case detection and treatment, interventions addressing disability prevention and self-care remain insufficient, especially in rural and resource-limited settings. The COVID-19 pandemic further disrupted access to rehabilitation services, highlighting the need for innovative service delivery models.

Telemedicine has emerged as a promising solution to address these gaps. International evidence demonstrates that telehealth platforms can effectively deliver training and improve disease management outcomes. Vaughan et al. reported high acceptability of telemedicine for community health worker training in diabetes care.⁴ Paixão et al. demonstrated the success of telehealth-based distance education in leprosy management in Brazil, with excellent satisfaction and completion rates.⁵ Macabasag et al. underscored the need to integrate telemedicine into existing healthcare systems in lower-middle-income countries to improve reach and efficiency.⁶

Local studies have similarly shown the feasibility and effectiveness of teledermatology. Lansang et al. and Carpio et al. demonstrated that diagnostic accuracy and patient outcomes in teledermatology are comparable to in-person consultations.^{7,8} Pilot studies at the Philippine General Hospital confirmed that leprosy could be diagnosed accurately using mobile phone images.^{9,10} The Leprosy Alert and Response Network System (LEARNS) further illustrated the potential of mobile technology in improving early leprosy detection.¹¹

LEARNS is the Philippines' first mobile phone-based leprosy detection system.¹¹ Frontline village health workers send messages and photographs of suspected leprosy patients to leprosy experts for opinion. An evaluation was carried out to determine the diagnostic concordance between LEARNS and in-person diagnosis of leprosy showed that LEARNS had 83% sensitivity to correctly identify suspect lesions as leprosy and a 77% specificity to exclude leprosy when the image of the suspect lesions was included. Mobile phone teledermatology has also been used as a research tool to detect cases and to assess clinical responses of T'boli patients with tinea imbricata and Yaws in Southern Philippines.^{12,13}

Telerehabilitation remains a developing field in the Philippines. Leochico et al.¹⁴ identified barriers such as limited internet connectivity and resistance to telehealth adoption, yet small studies on telerehabilitation for amputee care,¹⁵ speech therapy in rural settings,¹⁶ post-arthroplasty rehabilitation,¹⁷ and wheelchair reassessments for community-dwelling patients with spinal cord injury¹⁸ suggest its growing potential.

In response to these identified needs, the TeleRPOID Project was developed to strengthen disability prevention and rehabilitation services for patients with leprosy, LF, mycetoma, diabetes, and chronic wounds. This study aims to evaluate the feasibility and effectiveness of a four-month telehealth-based training program for healthcare workers, informal carers, and patients, focusing on improving case detection, self-care, and patient-reported outcomes.

MATERIALS AND METHODS

Study Design

This pilot feasibility implementation research used a mixed-methods design consisting of quasi-experimental pre–post analysis, cross-sectional surveys, observations, and qualitative interviews. Implementation research applies multidisciplinary approaches to improve health outcomes and strengthen equity, scale-up, and sustainability by integrating policies into real-world settings.¹⁹ This design aligns with the recommendation of the WHO for integrated approaches in managing Skin NTDs.²⁰

Study Setting and Site Selection

The study was conducted in Region 12 in the Southern Philippines (Mindanao Island group), endemic for both leprosy and LF. Sites were selected based on disease prevalence, presence of disability, recommendations from regional coordinators, and internet availability. Nine municipalities were invited to stakeholder orientations, with two (Bagumbayan and Columbio in Sultan Kudarat) agreeing to participate.

Participant Recruitment and Consent

Participants were purposively sampled and nominated by Municipal Health Officers (MHOs). Healthcare workers (HCWs) included licensed health professionals; lay participants were persons with disability or informal carers with at least one year of experience. Inclusion criteria were: ≥18 years old, literate in Filipino and English, and capable of following instructions. Exclusions included psychological issues or geographical inaccessibility. Informed consent forms, translated into local dialects, were provided. Consent for medical photography/video was secured from practicum patients.

Preparation and Course Materials

The research team conducted a series of activities from preparation to implementation and evaluation (Figure 1). The team also developed instructional materials, including 18 learning resources: seven training videos (including wound care and nerve function assessment), two slide sets (English and Filipino), and nine electronic booklets/posters. Reference materials were pre-tested for face validity. The primary reference was the American Leprosy Mission's Ten Steps: A Guide for Health Promotion and Empowerment of People Affected by Neglected Tropical Diseases,²¹ supplemented by the clinical expertise of Dermatology, Rehabilitation Medicine, and Physical Therapy trainers.

Planning and Procurement

Memoranda of Understanding were signed with MHOs, and local coordinators (leprosy or LF program coordinators) were oriented via two online meetings. Course materials, including printed handouts, videos, and clinic supplies, were procured by local health units and investigators.



Figure 1. Flowchart of study activities.

Implementation of the Teletraining Course

For telehealth, a desktop computer or a mobile device (such as a laptop or smartphone) was essential, along with an integrated or external microphone and camera. The internet connection needed to support at least 15 Mbps download and 5 Mbps upload speeds to ensure smooth communication. Clinic supplies included a wash basin, water, soap, cloth, gauze, elastic bandages, petroleum jelly, and minor surgical instruments. Specialized equipment such as the nylon monofilament set for nerve function assessment and rulers / tape measures were also provided. Clinic supplies / equipment not locally available were sourced from Metro Manila and shipped to study sites. The training sessions took place in a conference room at the municipal health office, which offered adequate space and ventilation for the activities.

The course content was enriched with the clinical experience of the trainers. A set of course topics was prepared for health personnel, and another set for informal carers and patients (Appendix A). Teletraining used the following asynchronous and synchronous modalities:

- 1. Asynchronous Learning: Training materials (reading materials, videos, quizzes) were shared via Google Drive and flash drives. Learners completed pre-tests, post-tests, and written examinations.
- 2. Synchronous Training: Live sessions on Google Meet included interactive demonstrations on wound care, edema management, self-care for neuropathic disabilities, and nerve function assessment. Technical checks and venue preparations were completed beforehand (Figure 2).

The synchronous session was divided into four parts:

• Wound Care: Skills on wound antiseptic preparation, wound measurement, cleaning, and honey-impregnated gauze application were demonstrated and practiced.



Figure 2. Teletraining set-up for wound care and nerve function assessment skills training.

- **Rehabilitation:** Training on scar care, manual edema massage, compression bandaging, and mobility exercises was conducted in collaboration with rehabilitation specialists.
- Self-care Training: Participants were taught protective self-care measures for the eyes, hands, and feet, using materials adapted from WHO's community-based LF rehabilitation modules.
- Nerve Function Assessment (NFA): Hands-on training included nerve palpation, motor function testing, sensory testing, and completing the National Leprosy Control Program (NLCP) patient record form.
- 3. **Practicum:** Participants applied learned skills on actual patients with chronic wounds or disabilities in their communities. Video/photo documentation of return-demonstrations and case narratives were submitted via Messenger, with mentorship provided through digital communication.

Study Design and Data Collection

This evaluation used a qualitative approach through key informant interviews and in-depth interviews with Municipal Health Officers (MHOs), local coordinators, and training participants. These interviews gathered feedback on the training's impact on participant attitudes and the feasibility of TeleRPOID. Six participants from Bagumbayan provided written responses.

Feasibility Assessment

Feasibility was assessed based on:

• **Implementation:** training completion rates, passing rates, resource needs, and factors affecting implementation.

- Acceptability: participant satisfaction (via the Telehealth Usability Questionnaire), willingness to continue using teletraining, perceived appropriateness, and alignment with organizational culture.
- **Practicality:** efficiency, quality of training delivery, participant ability to perform intervention activities, and cost per participant.

Participants completed evaluation forms (Google Form or hard copy) with 16 Likert-scale questions and submitted narratives about their practicum experiences. Key informant interviews and written reports were analyzed to assess feasibility.

Outcome Measures

- Effectiveness of Training: Measured via written pre-tests and post-tests, return-demo and practicum assessments using standard OSCE checklists for wound care and nerve function. Passing was set at 70%.
- **Case Detection:** The number of Skin NTD cases with disabilities and other target conditions detected within four months post-training compared to the previous year.
- **Patient Outcomes:** Self-care practices, disability reduction, morbidity outcomes, and the number of trained informal carers capable of health education and home care.

Data Management and Analysis

Test scores and evaluation data were encoded in Excel. Descriptive statistics (means, mean differences, standard deviations, frequencies, and proportions) were used for quantitative data. Recurring themes from interviews and narratives were identified and summarized with representative quotes.

Ethical Considerations

The study protocol followed the National Ethical Guidelines for Health and Health-related Research and the Data Privacy Act of 2012, and was approved by the University of the Philippines Medical Research Ethics Board (UPMREB 2020-0730-01) and the Cotabato Regional and Medical Center Ethics Committee (2021:025).

RESULTS

The study ran from 2021 to 2022. Preparation, originally planned for six months, was extended until July 2022 due to COVID-19-related disruptions. Teletraining was implemented from August to November 2022.

Participants Profile

Sixteen healthcare workers participated (15 females, 1 male), aged 25–59. Their professional backgrounds included

	Municipality of Bagumbayan	Municipality of Columbio
Sex		
Male	1	0
Female	7	8
Highest educational attainment		
Elementary	0	0
High School	1	1
College	4	6
Post-graduate	3	1
Occupation		
Physician	1	1
Nurse	2	1
Midwife	0	3
Barangay Health Worker	5	1
Barangay Nutrition Scholar	0	2

Table 2. Training Output of Participants (N=16)

Activities	Bagumbayan No. (%)	Columbio No. (%)	Total No. (%)
Synchronous session	8 (100.0)	8 (100.0)	16 (100.0)
Return demo videos	4 (50.0)	7 (87.5)	11 (68.8)
Practicum	5 (62.5)	6 (75.0)	11 (68.75)

physicians (2), nurses (3), midwives (3), Barangay Health Workers (6), and Barangay Nutrition Scholars (2) (Table 1). Educational levels ranged from secondary (2), tertiary (10), to postgraduate (4). Only two participants had prior training in leprosy care, and most lacked experience in managing leprosy, filariasis, chronic wounds, or disabilities. Only the physicians were familiar with telemedicine.

Training Outcomes

All participants completed written examinations and attended the synchronous training (Table 2). Most submitted practicum videos and case reports within three months. In Bagumbayan, participants demonstrated NFA and wound care procedures. In Columbio, participants showcased Dakin's solution preparation, NFA, and wound care using honey-impregnated dressings. Across both municipalities, each participant managed at least one patient, totaling eight practicum patients: six with wounds (including leprosyrelated) and two with leprosy without wounds.

Effectiveness of Training

Written Assessments

In Bagumbayan, 75% passed both the pre-test and post-test on the Ten Steps Guide. In Columbio, all participants passed. Formative assessments on wound care and lymphedema showed 87.5% to 100% accuracy. Overall, 87.5% passed the Ten Steps post-test and 93.75% passed wound and lymphedema assessments.



Figure 3. Healthcare worker participant using a ballpoint pen to assess sensory function of the palm (A) and the sole (B) of leprosy patients.



Figure 4. Return-demo of how to prepare **(A)** Dakin's wound antiseptic solution using plain household bleach and clean water; and **(B)** honey-impregnated gauze dressings for a wound (simulation).

Skills Assessments

1. Nerve Function Assessment

Most participants performed palpation, motor testing, and sensory assessments (Figure 3) correctly, though some errors were noted (e.g., incorrect nerve palpation sites and omission of skin surveys).

2. Wound Care

Participants demonstrated key skills such as wound cleaning with Dakin's solution and application of honey dressings (Figure 4). However, hand hygiene and saline rinsing were frequently missed steps.

A total of 10 videos on wound care were submitted and reviewed (Figure 5). The wounds of the patients who participated ranged from abrasions to foot ulcers and sacral ulcers. All participants prepared their wound cleaning supplies on a nearby flat surface before initiating the procedure. Most of the items from the wound cleaning supplies checklist were available; however, all participants did not prepare plain



Figure 5. (A-B) Healthcare worker participant cleaning and dressing a neuropathic ulcer of a leprosy-affected patient. (C-D) Village health worker participant cleaning and debriding a diabetic foot ulcer. (E-F) Healthcare worker participant preparing pure honey-impregnated gauze dressing for a patient with sacral ulcer during a home visit.

saline solution for rinsing the wounds and a bucket or kidney basin over which they could position the wounded area to collect fluid. All participants were able to demonstrate the following core wound cleaning skills: wearing gloves prior to performing the procedure, rinsing the wound with Dakin solution, gently dabbing the wound with gauze, applying a thick layer of petroleum jelly and pure honey over the wound, covering the wound with clean gauze, and taping the gauze in place with paper tape. In addition, one participant successfully performed debridement of the adherent slough on the patient's ulcer using surgical scissors.

Areas for improvement include performing the WHO hand hygiene steps with soap and clean water. Only two participants demonstrated this skill prior to wearing gloves. The step of intermittently rinsing the wound with plain saline solution was also missed by all 6 participants.

Overall, majority of the participants demonstrated proficiency in nerve function assessment and wound care.

Feasibility of the TeleRPOID Training

Appendix B shows the frequency distribution of the responses to each of the items or topics in the evaluation form.

Implementation

Most participants (62.5%) rated the attainment of objectives as good (4/5), and 37.5% rated it very good (5/5). Challenges included unstable internet, difficulty adapting to online training, and scheduling conflicts.



Trainer Effectiveness

Participants rated trainer performance highly, with 56.25% giving a score of 4 and 37.5% scoring it 5.

Detection of New Cases

No new leprosy cases were detected within four months after training.

Acceptability

- **Satisfaction:** Most participants (68.75%) expressed satisfaction with the teletraining platform, with increased confidence in managing disability care.
- Usability: Participants found the system useful and easy to navigate.
- Willingness to Continue: All participants expressed interest in future teletraining.
- Fit and Appropriateness: While participants acknowledged the advantages of online training, poor internet connectivity and limited computer literacy remained barriers.

Practicality

- Efficiency: 87.5% rated the training as efficient. Participants reported noticeable patient improvements.
- **Timeliness:** While most found the pace acceptable, challenges with patient recruitment and scheduling led to delays.

• **Quality:** The majority (93.75%) rated the quality of training as good or excellent.

Patient Outcomes

While objective measures were not recorded, participants reported patient satisfaction and improvements in wound healing. Two cases achieved complete healing. The training contributed to patient well-being by improving both care delivery and psychological support.

Cost

Total project expenditure was USD 14,988.80, or approximately USD 936.75 per participant.

Dissemination

Results were shared with stakeholders through reports and presentations, including at the First Global Meeting on Skin NTDs (March 2023) and the University of the Philippines Faculty Research Forum (November 2023). A policy brief is being developed for the Department of Health.

DISCUSSION

The TeleRPOID study was an implementation research project demonstrating the feasibility of teletraining peripheral healthcare workers (HCWs) and lay carers on disability prevention and rehabilitation for Skin NTDs and chronic wounds. The program combined synchronous and asynchronous teaching, with practical applications, using the *Ten Steps* guide²¹ enhanced by input from Dermatology and Rehabilitation Medicine experts.

Although participants with disabilities or chronic wounds could not be included as planned, written feedback and narratives from HCWs confirmed the training's feasibility in terms of implementation, acceptability, and practicality. The main barriers were weak internet connections and limited local medical supplies.

Practical, Low-cost Approaches

Training emphasized simple, resource-appropriate solutions, including wound measurement with graphing paper, petroleum jelly for wound care, homemade Dakin's solution, and sensory testing using a ballpoint pen. Most materials were locally available, though sourcing pure honey for wound care proved difficult.

Integrated Wound and Disability Care

Participants effectively applied their wound care and nerve function assessment skills, particularly for diabetic and leprosy-related ulcers. This validated the cross-cutting relevance of these skills. However, participants missed out on foot sensory screening for diabetes, highlighting a key focus area for future training. No cases of swelling due to lymphatic filariasis were encountered, limiting practice in edema management.

Comparison with other Teletraining Programs

Unlike WHO's online NTD courses or the Philippine DOH Academy modules, which are asynchronous and lack practical components,²³⁻²⁵ TeleRPOID included telementoring and skill assessments. Similarly, Project ECHO offers telementoring and hands-on learning for cervical cancer screening and served as a good model for this approach.²⁶ However, invasive procedures like sharp debridement still require on-site training for safety.

Cost Considerations

Teletraining reduced costs by eliminating travel and minimizing work absences. Institutional subscriptions to platforms like Google Meet and Drive were used at no cost. While costs were higher than projected due to fewer participants, future adoption by Local Government Units (LGUs) can lower expenses and increase ownership.

Training Mixed-Level HCWs and Lay Carers

Although patients could not participate, trained RHU personnel included them in their practicum, promoting indirect learning. Training mixed-levels of HCWs and lay carers fostered interaction and mutual learning, aligning with Lehman's recommendation for participatory approaches.²⁷

Limitations and Recommendations

The study's small scale (two RHUs, 16 participants), COVID-related delays, and internet connectivity issues limited the ability to assess real-time knowledge and skills. Open-book exams, time constraints, and varying English proficiency levels may have affected test results. Additionally, the absence of structured feedback sessions limited evaluation of training materials.

Despite its limitations, this study showed that teletraining HCWs and lay carers in remote, resource-limited settings is feasible and potentially impactful. Addressing connectivity issues, reinforcing key clinical skills, and including patients more directly in future training will improve outcomes. Table 3 briefly presents recommendations from this study.

CONCLUSION

The 4-month telehealth training program for healthcare workers, informal carers, and patients on the integrated rehabilitation and prevention of impairments and disabilities of leprosy, lymphatic filariasis, mycetoma, diabetes, pressure ulcers, stasis ulcers, and other chronic wounds was found to be feasible and effective by participants of Sultan Kudarat province. The major limitation negatively affecting feasibility of teletraining would be the unreliable or weak internet connection in these communities and the lack of supplies that can be purchased locally.

The teletraining was effective in improving case finding. Participants were able to find patients with target conditions to practice their skills on such as neuropathic foot ulcers

Table 3. Recommendations

For Researchers and Implementers	 Refine course design with formative assessments for each module. Emphasize swelling management and develop clear rubrics for hands-on skills. Increase sample size and extend implementation to 6-8 months for better practicum outcomes. Strengthen feedback mechanisms by reviewing practicum videos in detail.
For Local Government Units (LGUs) and Health Units	 Support ongoing training for healthcare and village health workers on NTDs and disability care. Encourage echo sessions using <i>The Ten Steps</i> guide. Invest in reliable internet, medical supplies, and sustained RPOID services. Conduct local information campaigns to promote early detection and care.
For International and Philippine Health Authorities	 Continue supporting integrated strategies for skin NTDs. Fund capacity-building efforts for regional health workers. Promote teletraining models combining synchronous sessions, asynchronous materials, and telementoring, in collaboration with academic and medical organizations.

(leprosy and diabetes), traumatic wounds, pressure ulcer, and leprosy cases. There were no participants who were patients but trained informal carers were capable of disseminating health information to community members, detect disability, and providing home-based care with improved confidence in their work. Participants reported better wound healing among their practicum patients and patients expressed increased satisfaction with the care demonstrated by the participant health workers.

This study provides a proof-of-concept that TeleRPOID teletraining is feasible in terms of implementation, acceptability, and practicality.

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Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

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REFERENCES

- Leonardo L, Hernandez L, Magturo T, Palasi W, Rubite J, de Cadiz A, et al. Current status of neglected tropical diseases (NTDs) in the Philippines. Acta Trop. 2020 Mar;203:105284. doi: 10.1016/j. actatropica.2019.105284. PMID: 31786109.
- Upputuri B, Srikantam A, Mamidi R. Comorbidities associated with non- healing of plantar ulcers in leprosy patients. PLoS Negl Trop Dis. 2020 Jun;14(6):e0008393. doi: 10.1371/journal.pntd.0008393. PMID: 32598386. PMCID: PMC7351235.
- World Health Organization, OECD, International Bank for Reconstruction and Development, The World Bank. Delivering quality health services: a global imperative for universal health coverage [Internet]. 2019 [cited 2020 July]. Available from: https://www.who. int/publications-detail-redirect/9789241513906
- Vaughan E, Naik A, Lewis C, Foreyt J, Samson S, Hyman D. Telemedicine Training and Support for Community Health Workers: Improving Knowledge of Diabetes. Telemed E-Health. 2020 Feb; 26(2):244–50. doi:10.1089/tmj.2018.0313. PMCID: PMC7044768.
- Paixão M, Miot H, de Souza P, Haddad A, Wen C. A university extension course in leprosy: telemedicine in the Amazon for primary healthcare. J Telemed Telecare. 2009 Mar;15(2):64–7. doi: 10.1258/ jtt.2008.080704. PMID: 19246604.
- Macabasag R, Magtubo K, Marcelo P. Implementation of Telemedicine Services in Lower-Middle Income Countries: Lessons for the Philippines. JISfTeH. 2016 Nov;4:e24. [cited 2020 July];4:e24]. Available from: https://journals.ukzn.ac.za/index.php/JISfTeH/ article/view/168
- Lansang M, Frez L. Teledermatology and clinic-based consultation: Agreement and acceptability in the Philippine setting. J Philipp Dermatol Soc. 2001 May;11(1):43–50.
- Carpio V, Dofitas B, Maano C, Dayrit C, Villena J, Jara M, et al. Store-and-Forward Teledermatology Using Mobile Phones: Clinical Efficacy in a Rural Primary Healthcare Centre Free Clinic Setting. JISfTeH. 2016;4:e28. Available from: https://journals.ukzn.ac.za/ index.php/JISfTeH/article/view/161
- 9. Ramirez A, Jara M, Dofitas B, Maano C. The Validity of Mobile Phone Camera as a Diagnostic Tool for Hansen's Disease: A Pilot Study. 2008. Section of Dermatology, Department of Medicine, Philippine General Hospital.
- Reyes K, Carait P, Dofitas B, Frez M, Maano C. Accuracy and usefulness of mobile phone images in the diagnosis of leprosy [Internet]. J Am Acad Dermatol. 2016 May 1;74(5):AB103. Available from: https://www.jaad.org/article/S0190-9622(16)00534-X/fulltext. https://doi.org/10.1016/j.jaad.2016.02.404
- Novartis Foundation. The Leprosy Alert and Response Network System (LEARNS) [Internet]. Novartis Foundation. [cited 2020 Nov]. Available from: https://www.novartisfoundation.org/past-programs/ accelerating-leprosy-and-malaria-elimination/leprosy-alert-andresponse-network-system-learns
- Eusebio-Alpapara K, Dofitas B, Balita-Crisostomo C, Tioleco-Ver G, Jandoc L, Frez L. Senna (Cassia) alata (Linn.) Roxb. leaf decoction as a treatment for tinea imbricata in an indigenous tribe in Southern Philippines. Mycoses. 2020;63(11):1226–34. doi: 10.1111/myc.13159. PMID: 32779266.
- Dofitas B, Kalim S, Toledo C, Richardus J. Yaws in the Philippines: first reported cases since the 1970s. Infect Dis Poverty. 2020 Jan 30;9(1):
 1. doi: 10.1186/s40249-019-0617-6. PMID: 31996251; PMCID: PMC6990502.

- Leochico C, Espiritu A, Ignacio S, Mojica J. Challenges to the Emergence of Telerehabilitation in a Developing Country: A Systematic Review. Front Neurol. 2020 Sep;11:1007. doi:10.3389/ fneur.2020.01007. PMID: 33013666. PMCID: PMC7505991.
- 15. Mojica J, Bundoc J. Inter-observer reliability in the use of cellphone technology as a community-based limb loss screening tool for prosthesis use. PARM Proc. 2014;6:45–50.
- Ponciano-Villafania J, Odtuhan E, Tria C, Capacite J, Dequiña M, Alano J, et al. Telerehabilitation for Speech-Language Pathology in Community-Based Rehabilitation in the Philippines: A Feasibility Study. PJAHS. 2022;5:7-16. doi:10.36413/pjahs.0502.002
- 17. Leochico C. Telerehabilitation as a teaching-learning tool for medical interns. PARM Proc. 2017 Feb;9:39–43.
- Leochico C, Valera M. Follow-up consultations through telerehabilitation for wheelchair recipients with paraplegia in a developing country: a case report. Spinal Cord Ser Cases. 2020 Jul;6(1):1–6. doi: 10.1038/s41394-020-0310-9. PMID: 32632104. PMCID: PMC7338509
- Simpson H, Mengiste A, Mbonigaba J, Kollie K, Nganda M, Dean L, et al. Research priorities to support the development of integrated national strategies to control skin-neglected tropical diseases. Trans R Soc Trop Med Hyg. 2023 Feb;117(2):132–8. doi:10.1093/trstmh/ trac086. PMID: 36130404. PMCID: PMC9890312.
- WHO TEAM Control of Neglected Tropical Disease. Training module on community home-based prevention of disability due to lymphatic filariasis [Internet]. 2003 [cited 2020 Jul]. Available from: https://www.who.int/publications-detail-redirect/WHO-CDS-CPE-CEE-2003.35

- Lehman L, Geyer M, Bolton L. Ten Steps: A Guide for Health Promotion and Empowerment of People Affected by Neglected Tropical Diseases. USA: American Leprosy Missions, Inc.; 2015. [Internet]. [cited 2020 Jul]. Available from: https://leprosy.org/ wp-content/uploads/2022/02/ALM-10Steps-FULLGUIDE-021816.pdf
- Parmanto B, Allen Nelson Lewis J, Graham K, Bertolet MH. Development of the Telehealth Usability Questionnaire (TUQ). Int J Telerehabilitation [Internet]. 2016 Jul 1 [cited 2020 Jul];8(1): 3–10. Available from: http://telerehab.pitt.edu/ojs/Telerehab/article/ view/6196
- 23. WHO South-East Asia Regional Office. e-Learning Modules on Leprosy | Infolep [Internet]. 2021 [2023 Jan]. Available from: https:// www.leprosy-information.org/resource/e-learning-modules-leprosy
- WHO Implementation Monitoring and Evaluation. WHO Programme Managers' Training Course [Internet]. GSA. 2017 [cited 2023 Jan]. Available from: https://www.eliminateschisto.org/resources/ who-programme-managers%E2%80%99-training-course
- 25. Department of Health. DOH Academy E-Learning Platform [Internet]. [cited 2023 Jan]. Available from: https://learn.doh.gov.ph/
- Lopez M, Baker E, Milbourne A, Gowen R, Rodriguez A, Lorenzoni C, et al. Project ECHO: A Telementoring Program for Cervical Cancer Prevention and Treatment in Low-Resource Settings. J Glob Oncol. 2017;3(5):658–65. doi: 10.1200/JGO.2016.005504. PMID: 29094102. PMCID: PMC5646881.
- Lehman L. Personal experience with self-care training in different settings. Lepr Rev. 2021 Dec;92(4):375–8. doi: 10.47276/lr.92.4.375

APPENDICES

Appendix A. Course Topics

- A. Course Topics for Health Personnel
 - 1. Essential Facts about Skin Neglected Tropical Diseases: Leprosy, Lymphatic Filariasis, Mycetoma, and other causes of disabilities and deformities.
 - 2. The Ten Steps: A Guide for Health Promotion and Empowerment of People Affected by Neglected Tropical Disease. The following chapters were emphasized:
 - Step 5: Care for Skin and Nails
 - Step 6: Care for Wounds
 - Step 7: Care for Scars
 - Step 8: Care for Swelling
 - Step 9: Care for Movement Limitations
 - Step 10: Use of Protective Footwear
 - 3. Leprosy RPOID
 - 3.1. Lepra Reactions and other causes of deformities and disabilities
 - 3.2. Nerve Function Assessment
 - 3.3. Prevention of Impairments and Disabilities (Self-Care) Eyes, Hands and Feet
 - 3.4. Lower Extremity Amputation Prevention (LEAP): Care for the Neuropathic foot (Leprosy & Diabetes)
 - 4. Filariasis: Community home-based prevention of disability due to lymphatic filariasis²²
 - 5. Mycetoma: Recognition, prevention, and primary level care
 - 6. Basic Wound care
- B. Course Topics for Informal Carers and Patients
 - 1. Basic facts on skin NTDs (leprosy, lymphatic filariasis, mycetoma) and common causes of chronic wounds (diabetic foot, pressure ulcers, stasis ulcers)
 - 2. Self-care: skin, wounds, impairments, disabilities, deformities, lymphedema

Appendix B. Written Evaluation of the TeleRPOID Training Course (N = 16)

*(1 – Low rating; 5 – Highest rating)

	Evaluation question/topic	Rating*		Frequency		% of responses		
		Kating	Bagumbayan	Columbio	Total	Bagumbayan	Columbio	Total
l. In	nplementation							
1.	The TeleRPOID training was	1						
	able to accomplish all its objectives and activities	2						
	objectives and activities	3						
		4	4	6	10	50.0	75.0	62.5
		5	4	2	6	50.0	25.0	37.5
2.	I think my knowledge on	1						
	disability care improved	2						
	compared to the start of the TeleRPOID training	3						
	0	4	3	3	6	37.5	37.5	37.5
		5	5	5	10	62.5	62.5	62.5
3.	I think my skills on	1						
	disability care improved	2						
	compared to the start of the TeleRPOID training	3						
	the reference of D training	4	3	3	6	37.5	37.5	37.5
		5	5	5	10	62.5	62.5	62.5
4.	I think there were enough	1						
	materials and resources for	2						
	this TeleRPOID training	3	3	1	4	37.5	12.5	25.0
		4	4	6	10	50.0	75.0	62.5
		5	1	1	2	12.5	12.5	12.5
5.	I think the TeleRPOID	1						
	trainers were effective in	2						
	teaching and guiding me	3	1		1	12.5		6.3
		4	6	3	9	75.0	37.5	56.3
		5	1	5	6	12.5	62.5	37.5
II. A	cceptability		-				01.0	
6.	How satisfied are you	1						
	with the use of online/	2						
	teletraining program?	3	4		4	50.0		25
		4	4	7	11	50.0	87.5	68.75
		5		, 1	1	50.0	12.5	6.25
7.	How confident are you in	1		T	T		12.5	0.20
	performing the skills of	2						
	disability care now?	2						
		4	2	5	7	25.0	62.5	43.75
		4 5	6	3	7 9	75.0	37.5	43.75 56.25
8.	Would you be willing to	Yes	8	8	16	100.0	100.0	100.0
υ.	continue using teletraining for yourself as a healthcare	res No	0	0	10	100.0	100.0	100.0
	worker or patient?	Not sure						
9.	Reason for #8							
10.	Do you think that teletraining is appropriate for the health	Yes	4	8	12	50.0	100.0	75.0
	services in your area?	No						
	,	Not sure	4		4	50.0		25.0

Appendix B. Written Evaluation of the TeleRPOID Training Course (N = 16) (continued)

*(1 – Low rating; 5 – Highest rating)

	F	Rating*	Frequency			% of responses		
	Evaluation question/topic		Bagumbayan	Columbio	Total	Bagumbayan	Columbio	Total
III. F	Practicality							
11.	How would you rate the efficiency of teletraining on disability care?	1						
		2						
		3						
		4	7	7	14	87.5	87.5	87.5
		5	1	1	2	12.5	12.5	12.5
12.	How would you rate the	1						
	speed by which teletraining can accomplish its objectives/activities?	2						
		3	1	1	2	12.5	12.5	12.5
		4	6	6	12	75.0	75.0	75.0
		5	1	1	2	12.5	12.5	12.5
13.	How would you rate the	1						
	quality of implementation of the teletraining?	2						
		3						
		4	8	7	15	100.0	87.5	93.8
		5		1	1		12.5	6.3
14.	What are the positive effects of teletraining on you as a participant?							
15.	What are the negative effects of teletraining on you as a participant?							
16.	Over-all, how would you rate the teletraining in terms of its effectiveness in enabling participants to carry out disability care activities?	1						
		2						
		3						
		4	7	6	13	87.5	75.0	81.3
		5	1	2	3	12.5	25.0	18.8