

Survey on Awareness among Physiotherapists for Prevention and Management of Disabilities in Patients with Leprosy

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Leprosy affects the skin and peripheral nerves, leading to skin lesions, sensory loss, muscle weakness, and joint contractures which can eventually lead to disability, dysfunction, and disfiguration. Role of physiotherapists is considered important in the management of leprosy. The purpose of the present study was to evaluate awareness among physiotherapists' regarding prevention and management of disabilities in patients with leprosy. A descriptive study was conducted among 272 physiotherapists from Mumbai and Navi Mumbai. Data were collected through a self-administered questionnaire regarding prevention and management of disabilities in leprosy patients. The present study reported a high level of awareness among physiotherapists (99.6%) regarding leprosy and importance of physiotherapy interventions in preventing and managing secondary complications. A total of 78.15% of the participants had the knowledge regarding preventive strategies in leprosy and 84.46% of the participants had knowledge about various rehabilitation protocols for disability management in leprosy patients. Findings from the present study demonstrated that physiotherapists in Mumbai and Navi Mumbai are aware regarding leprosy, its prevention and management strategies for managing disabilities in patients with leprosy.

Keywords: Leprosy, Disability, Deformity, Physiotherapy, Rehabilitation, Awareness, Physiotherapists

Introduction

Leprosy, also known as Hansen's disease, is a chronic infectious disease caused by *Mycobacterium leprae* (Gilmore et al 2023). According to the report published by World Health Organization, the prevalence rate of Leprosy is 0.4 per 10,000 population in India (WHO 2022).

World Health Organisation declared Leprosy as a major Health problem as it is known to be associated with disabling deformities of hands and feet. Due to its disabling deformities, Leprosy is responsible for much of the social stigma and social rejection of the patients even with successful treatment. Leprosy stands out among bacterial

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infections because it infects the peripheral nerves and causes damage (Raghavendra et al 2017). The disease is notorious for the deformities and disability it inflicts on its victims (van Brakel et al 2012, Raghavendra et al 2017, Rathod et al 2020). Disability arises not only from reactions that often occur after treatment begins, but also significantly from the gradual progression of the disease (Raghavendra et al 2017). A substantial portion of the disability burden results from the failure to integrate prevention activities using straightforward techniques and patient motivation into leprosy management (Raghavendra et al 2017). The extent and severity of disability in new leprosy cases indirectly gauge disease transmission within the community and the speed of case detection (Raghavendra et al 2017). Among communicable diseases, Leprosy remains a leading cause of peripheral neuropathy and disability in the world. Therefore, the World Health Organisation has launched “Towards Zero Leprosy” as a global initiative to eliminate Leprosy as public Health problem by 2030 (WHO 2021). It is known that even after the disease is eventually eradicated many patients with disabilities will be left with nerve deficits and resultant complications who will require lifelong support from physiotherapists. The disease affects the skin and peripheral nerves, leading to skin lesions, sensory loss, muscle weakness, and joint contractures, this can eventually lead to disability, dysfunction, and disfiguration (White & Franco-Parades 2015). The presence of bacilli in the skin results in the dermatological symptoms of the disease, while nerve infection causes axonal dysfunction and demyelination, resulting in sensory loss and subsequent disability and deformity (White & Franco-Parades 2015).

Nerve damage in leprosy can vary, where the intradermal nerves can be involved in skin patches, or the peripheral nerve trunk can present a large lesion. Leprosy involves the superficial nervous system like the great

auricular, median, ulnar, sural, posterior tibial, and superficial peroneal (Alrehaili 2023). Neuropathy and associated disabilities are the chief medical outcomes of leprosy which is a huge medical concern worldwide. Neuronal injury in Leprosy may present as weakness or may result in silent neuropathy, contracture, or atrophy. Although leprosy is curable and treatment during early stages can prevent disability (Lockwood & Saunderson 2023). Reactions in leprosy pose important challenge to treating physicians and physiotherapists who have responsibility to manage the aftermath of inflammatory damage to nerves, joints, muscles etc. Besides many other known factors including mental stress, hormonal factors and infections, Covid-19 vaccines could trigger lepra reactions (Ramasamy et al 2023). If the reaction and neuritis that occurred by adverse events of immunization are left unmanaged, they can lead to permanent, progressive, and disfiguring disabilities (Bharadwaj et al 2021, Saraswat et al 2022).

Physiotherapists, as frontline healthcare providers, play a crucial role in the prevention and management of leprosy-related disabilities. However, their awareness and understanding of leprosy, its prevention, and effective management strategies may vary, impacting the quality of care delivered to affected individuals. This research aims to explore the current level of awareness among physiotherapists for management and prevention of disabilities in patients with leprosy, identify gaps in knowledge and practice, and propose strategies for enhancing education and training in this critical area of healthcare. By bridging these gaps, we can improve the overall quality of care and support for individuals affected by leprosy, ultimately contributing to the global efforts towards its elimination.

Methodology

The study commenced after approval from the Institutional Ethical Committee, MGM Institute

of Health Sciences, Navi Mumbai. To assess the knowledge of awareness regarding Leprosy prevention and management, a self-administered questionnaire with 17 questions covering various aspects of leprosy was created. These questions were validated by two subject experts focussing on relevant aspects for a physiotherapist. The participants included were physiotherapy practitioners, physiotherapy academicians, and physiotherapists working in hospital and clinics. The participants for data collection were identified from clinics and hospitals. A total of 360 participants were contacted out of which 272 participants responded and filled the survey. A purposive sampling was adopted in this study. The sample size was calculated using the GPower software. The sample size calculated was 260. The responses were collected during March 2024 and April 2024. The informed consent was sought from all participants. The responses were collected via google forms and the language used for data collection was English. After collecting the data, it was verified, errors were removed, and then the results were described. Finally, the analysed data was presented by using pie chart,

frequency tables and narrative texts.

Results

A total of 272 Physiotherapy professionals from Mumbai and Navi Mumbai participated in the survey after seeking informed consent. The mean age of participants was 27.10 ± 2.01 .

The male to female ratio was 1:5 with 84.2% were females. In terms of the educational qualification there were three groups in which 62.9% of the participants were BPT graduates, 35.3% were MPT graduates and 1.8% were PhD professionals. According to job profile of participants 11.4% were academicians, 67.3% were working in clinics and hospital and 21.3% were freelancers. Table 1 summarizes the demographic information of participants.

Table 2 presents responses on awareness among physiotherapists regarding prevention of leprosy. Most respondents (99.6%) were aware of leprosy, highlighting a high level of familiarity with the disease within the surveyed group. The majority 66.9% correctly answered lepromatous, as the severe form of leprosy showcasing a notable understanding of the disease spectrum.

Table 1 : Demographic information of the participants.

Demographic details	Total (n=272)	Percentage (%)	
Gender Distribution	Male	43	15.8%
	Female	229	84.2%
Residence	Mumbai	145	53.3%
	Navi Mumbai	90	33.1%
	Other	37	13.6%
Educational Qualification	BPT	171	62.9%
	MPT	96	35.3%
	PhD	5	1.8%
Job profile	Academicians	31	11.4%
	Clinics	131	48.2%
	Hospital	52	19.1%
	Freelancers	58	21.3%

Table 2 : Questions related to prevention of leprosy.

Questions	Correct answer percentage	Incorrect answer percentage
1. Are you aware about leprosy?	n=271 (99.6%)	n=1 (0.4%)
2. According to you, which is the most severe form of leprosy?		
a. Tuberculoid		n=54 (19.9%)
b. Borderline		n=9 (3.3%)
c. Lepromatous	n=182 (66.9%)	
d. Not sure		n=27 (9.9%)
3. Are physiotherapy interventions essentials for preventing and managing secondary complications, such as contractures in leprosy patients?	n=270 (99.3%)	n=2 (0.7%)
4. In your opinion, is regular screening for early detection of leprosy a crucial step in its prevention.	n=266 (97.8%)	n=6 (2.2%)
5. Which of the following are early symptoms of leprosy? (SELECT MULIPLE)		
a. Muscle weakness	n=203(74.6%)	
b. Skin discoloration	n=193 (71%)	
c. Fractures		n=14 (5.1%)
d. Numbness / Tingling	n=203(74.6%)	
e. Weight loss		n=78(28.7%)
f. Painless wound		n=112(41.2%)
g. Muscle stiffness	n=146(53.7%)	
6. Which is the common deformity seen in leprosy?		
a. Swan neck deformity		n= 9 (3.3%)
b. Claw hand deformity	n=106 (39%)	
c. Dupuytren's contracture		n=8 (2.9%)
d. Club hand		n=15 (5.5%)
e. All of the above		n=134(49.3%)
7. Do you think physiotherapy plays a limited role in the prevention of disabilities in Leprosy affected individuals?	n=202(74.3%)	n=70(25.7%)
8. Do you think regular monitoring and assessment of patients with leprosy are essential to prevent progression of disabilities?	n=270 (99.3%)	n=2 (0.7%)
9. The goal of disability prevention are/is:		
a. To prevent occurrence of any disabilities		n= 19 (7%)
b. To prevent worsening of existing disabilities		n=25 (9.2%)
c. Both	n=228(83.8%)	
d. None		n= 0 (0%)

Additionally, 99.3% agreed on the importance of physiotherapy interventions in preventing and managing secondary complications such as contractures.

The significance of regular screening for

early detection of leprosy was acknowledged by 97.8%, showing the recognition of the importance of proactive measures in disease prevention. Participants showcased varying levels of knowledge regarding early symptoms

Table 3 : Questions related to management of leprosy.

Questions	Correct answer number of respondents (percentage)	Incorrect answer number of respondents (percentage)
1. Physiotherapy can contribute significantly to rehabilitation and functional improvement of patients undergoing treatment for Leprosy	n=270 (99.3%)	n=2 (0.7%)
2. Early initiation of physiotherapy can enhance the overall quality of life for individuals affected by leprosy	n=271 (99.6%)	n=1 (0.4%)
3. Physiotherapy interventions, such as range of motion exercise, are beneficial in preventing joint deformities in patients with Leprosy	n=271 (99.6%)	n=1 (0.4%)
4. Physiotherapy including sensory re-education techniques is crucial for managing neuropathic symptoms in Leprosy patients	n=265 (97.4%)	n=7 (2.6%)
5. Regular physiotherapy interventions can aid in preventing muscle weakness and improving muscle strength	n=272 (100%)	n=0
6. According to you, in which stage of leprosy, physiotherapy plays an important role in managing disabilities:		
a. Early infection		n=38 (14%)
b. Intermediate stage		n=29 (10.7%)
c. Late stage		n=6 (2.2%)
d. All of the above	n=199 (73.2%)	
7. Do you think incorporating physical exercise in the management of leprosy is unnecessary, given the primary focus on medication?	n=133 (48.9%)	n=139(51.1%)
8. What services can a Physiotherapist provide for a Leprosy patient?		
a. Evaluation and prevention of deformities	n=157 (57.7%)	
b. Health promotion / Disease guidelines		n=16 (5.9%)
c. Treatment and reintegration of patients into society		n=61(22.4%)
d. Not sure		n=38 (14%)

of leprosy, a significant proportion correctly answered muscle weakness 77.2%, general skin discoloration 71%, numbness and tingling 74.6%, and muscle stiffness 53.7%.

Regarding deformities associated with leprosy, approximately 39% correctly answered common deformities, showcasing a moderate level of awareness in this area. However, a concerning 74.3% believed that physiotherapy plays a limited role in preventing disabilities in leprosy-affected individuals. Despite this, there was strong agreement 99.3% on the necessity of regular monitoring and assessment to prevent the progression of disabilities in leprosy patients. Lastly, a significant majority 83.8% recognized that the goals of disability prevention include both preventing the occurrence of disabilities and preventing the worsening of existing disabilities.

The findings from the survey on the management of leprosy are presented in Table 3 which highlight the widespread acknowledgment of the significant role of physiotherapy in improving the quality of life of individuals with leprosy. Most of the participants (99.3%) recognized the substantial contribution of physiotherapy to the rehabilitation and functional improvement of patients undergoing leprosy treatment. Similarly, there was strong agreement by 99.6% on the early initiation of physiotherapy to enhance the overall quality of life for individuals affected by leprosy. Moreover, participants acknowledged the effectiveness of physiotherapy interventions, such as range of motion exercises, in preventing joint deformities, with 99.6% expressing support for such measures. Sensory re-education techniques were deemed crucial for managing neuropathic symptoms by 97.4% of respondents, showing a comprehensive understanding of the role of physiotherapy in addressing various aspects of leprosy-related complications.

Remarkably, all participants (100%) recognized the role of regular physiotherapy interventions

in preventing muscle weakness and improving muscle strength, underscoring the unanimous agreement on the importance of ongoing rehabilitation efforts. Regarding role of Physiotherapy in different stages, 73.2% participants reported that Physiotherapy plays an important role in all stages of leprosy while smaller proportions attributed significance to the Early 14% and intermediate stages 10.7%, and only a minority believed physiotherapy was relevant in the late stage of leprosy (2.2%). Despite the overwhelming support for physiotherapy interventions, nearly half of the respondents 48.9% believed that incorporating physical exercise in the management of leprosy is unnecessary, highlighting a potential misconception regarding the holistic approach needed to address the disease.

Lastly, while a majority 57.7% recognized the role of physiotherapists in evaluating and preventing deformities among leprosy patients, there were varying levels of awareness regarding other services provided by physiotherapists, indicating a need for further education on the comprehensive care they can offer in managing leprosy.

Discussion

Prevention and management of disabilities in leprosy continues to be important as highlighted by a recent institution-based study of Rathod et al (2020). The role of physical therapy is globally recognized (Nardi et al 2023). The aim of the present study was to assess the awareness among physiotherapists regarding the prevention and management of disabilities in patients with leprosy. A significant aspect of this study was that the awareness assessment was conducted through open-ended questions, allowing respondents to freely express their views. The survey respondents were predominantly females, reflecting the profession's demographics. It is observed that there are more female

physiotherapists than males among. Overall, the results emphasize the crucial role of physiotherapy in the comprehensive management of leprosy and underscore the importance of continued education and awareness efforts to ensure optimal care for affected individuals. Previous literature suggested that raising public awareness about healthcare facilities and providing adequate training aids in the early identification and management of impairments, thus preventing permanent disabilities (van Brakel et al 2012). The high levels of awareness observed in this study may be attributed to the specialized training and continued professional development that physiotherapists undergo. Educational programs and workshops focusing on leprosy and its management might contribute to the robust understanding observed among participants. Additionally, the predominance of female physiotherapists in the survey population may reflect a higher engagement or interest in areas related to chronic conditions and disability management, as evidenced by gender trends in the healthcare profession (Nielsen et al 2019). Ek (2015) has also reported that women are more interested in health-related information, whether it is related to learning as professionals needs to be researched.

The present study revealed that 78.15% of participants were knowledgeable about preventive strategies in leprosy. This finding is significant as preventive measures are crucial in reducing the incidence of leprosy-related complications and improving patient outcomes. A recent study suggested physiotherapy interventions aid in restoring normal functioning in patients with leprosy by preventing disabilities (Jawade & Jawade 2020). Physiotherapists contribute to rehabilitation by strengthening muscles, preventing contractures, and restoring joint mobility. However, their awareness and understanding of leprosy, its prevention, and effective management strategies may vary,

impacting the quality of care provided to affected individuals (Álvarez & Hans Filho 2020). Preventive strategies are well-documented in the literature, which emphasize the importance of early diagnosis, timely intervention, and patient education in preventing the progression of leprosy and its associated disabilities. The high level of awareness among our respondents regarding these strategies suggests that physiotherapists are well-informed and likely to apply preventive measures effectively in their practice. It would be proper to assess the levels of awareness in physiotherapists in different settings as there could be variations in emphasis in teaching and training in different institutions across the country.

Furthermore, 84.46% of participants demonstrated knowledge of various rehabilitation protocols for managing disabilities in leprosy patients. This is consistent with existing research that highlights the effectiveness of specific rehabilitation protocols in addressing the multifaceted needs of leprosy patients, including those related to physical function, mobility, and quality of life. The strong awareness of rehabilitation protocols among our participants indicates that physiotherapists are not only aware of but are also prepared to implement evidence-based practices in their clinical work.

Physiotherapy plays a crucial role in the recovery of individuals affected by disabilities due to leprosy or in preventing these disabilities altogether. The early signs and symptoms of leprosy, as reported by a majority of respondents, primarily involve painless wounds and numbness. (Govindharaj et al 2021). These indicators align closely with the findings of Srivastava et al, which also emphasized discoloured skin patches, sensory alterations, and ulcerative lesions on the hands and feet as common manifestations of the disease (Srivastava et al 2011). Such recognition of symptoms underscores the importance of

prompt detection in preventing the development of deformities and interrupting the transmission of leprosy within communities.

In addition to awareness, the practical aspect of early diagnosis plays a critical role in mitigating the impact of leprosy. Regular and periodic nerve function assessments help in identifying nerve damage at an early stage (Husain 2011). By implementing such assessments as part of routine healthcare protocols, healthcare providers can detect neuropathy promptly, enabling timely intervention and preventing the progression of disability associated with leprosy. This proactive approach not only improves individual outcomes but also contributes to the broader goal of leprosy control and elimination (Husain 2011). Role of physical rehabilitation programme has also been highlighted by Serrano-Coll et al (2016). By implementing evidence-based strategies, physiotherapist can effectively manage symptoms, prevent complications, and enhance the overall well-being of individuals living with leprosy. Moreover, physiotherapists play a crucial role in educating patients caregivers, and communities about the importance of rehabilitation and self-management strategies, empowering individuals to actively engage in their care and achieve optimal outcomes (Suresh et al 2008, Hasan & Zafar 2023).

The National Strategic Plan 2023-27 underscores the critical role of physiotherapists in the prevention and management of disabilities, particularly in chronic conditions such as leprosy. As outlined in the plan, physiotherapists are essential in providing comprehensive care aimed at reducing the impact of disabilities and enhancing the quality of life for affected individuals (National Strategic Plan 2023-27). The National Strategic Plan highlights the importance of early intervention in preventing disabilities associated with leprosy (National Strategic Plan

2023-27). Physiotherapists are instrumental in this regard, as they possess the expertise to identify early signs of functional impairment and prevent the progression of disability through targeted exercises and therapeutic interventions. Physiotherapists play a pivotal role in the rehabilitation of leprosy patients, addressing issues such as muscle weakness, joint deformities, and sensory loss (National Strategic Plan 2023-27). The strategy plans advocate for the implementation of customized rehabilitation programs, which include strength training, joint mobilization, and functional exercises designed by physiotherapists. This rehabilitation process not only aims to restore physical function but also to enhance patients' independence and participation in daily activities. The National Strategic Plan emphasizes the need for increased awareness and education among healthcare professionals and the public. Physiotherapists are key players in this educational effort, as they are well-positioned to educate patients and their families about the management of leprosy-related disabilities. The plan highlights the importance of a multidisciplinary approach in managing leprosy-related disabilities. Physiotherapists often work alongside dermatologists, infectious disease specialists, and other healthcare professionals to provide holistic care. This collaborative model ensures that all aspects of the patient's health are addressed, from the medical treatment of leprosy to the management of functional impairments. As the National Strategic Plan outlines the need for policy development and advocacy, physiotherapists can contribute by advocating for better resources, training, and support for leprosy care. Approach of focusing on physiotherapy students (Sadhu et al 2022) is likely to be a rewarding strategy.

The role of physiotherapists as defined by the National Strategic Plan 2023-27 necessitates a deep understanding of leprosy and its associated

disabilities. Physiotherapists must be equipped with specialized knowledge and skills to address the unique needs of these patients effectively. The survey on awareness among physiotherapists is therefore crucial in identifying gaps in knowledge and practice. Enhancing awareness and training will enable physiotherapists to fulfil their role more effectively, ultimately leading to better outcomes for patients with leprosy.

Conclusion

Findings of present study shows that physiotherapists in Mumbai and Navi Mumbai are aware regarding leprosy, its prevention and management strategies for managing disabilities in patients with leprosy. With proper teaching and training similar levels of awareness and competence can be achieved all over the India and other parts of world.

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