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Holistic management of a 51-year-old male patient with multibacillary hansen's disease through a family doctor approach

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ABSTRACT

Hansen's disease, or leprosy, is a chronic progressive granulomatous disease caused by Mycobacterium leprae, which primarily affects the skin and peripheral nervous system. This disease remains a public health problem in several regions of Indonesia, including Grobogan Regency. The prevalence rate of leprosy in Grobogan Regency in 2022 was 3 per 100,000 population, and the incidence rate of new cases was 0.7 per 100,000 population. This case report aims to apply the principles of family medicine in the holistic and comprehensive management of leprosy patients, with a patient-centered and family-oriented approach, based on evidence-based medicine. This report uses a case study approach. Primary data were obtained through anamnesis, physical examination, and home visits to evaluate the patient's living environment. The evaluation was conducted comprehensively through a holistic diagnostic approach, covering the initial phase (assessment), the intervention process, and the results. The management of leprosy with a holistic and evidence-based family medicine approach can provide more optimal results, not only in clinical aspects but also in improving the understanding and involvement of patients and their families. This approach supports efforts to prevent disability and improve the overall quality of life of patients.

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INTRODUCTION

Leprosy (Hansen's disease) is a chronic infectious disease caused by the bacterium Mycobacterium leprae. It primarily affects the skin, peripheral nerves, upper respiratory tract, and eyes. Leprosy can cause permanent nerve damage, disability, and social stigma if not treated properly (World Health Organization, 2021)

Globally, leprosy remains a health problem in several tropical and subtropical countries, including Indonesia. According to data from the Indonesian Ministry of Health (2023), Indonesia

ranks third in the world with the highest number of leprosy cases after India and Brazil, with 15,000 new cases per year. In Central Java, approximately 1,200 active cases were reported in 2022, making it one of the provinces with a high burden of leprosy in Indonesia (Kemenkes, 2023; Dinas Kesehatan Provinsi Jawa Tengah, 2022). Meanwhile, Grobogan Regency is an endemic area with 150 new cases in the last five years, indicating high transmission rates and the need for serious treatment (Dinkes Grobogan, 2023).

Delayed diagnosis of MH can lead to serious complications such as permanent disability (paralysis, finger contractures), skin ulceration and secondary infection, nerve damage (sensory/motor neuropathy), and visual impairment or even blindness (World Health Organization, 2021). Physical disabilities caused by leprosy are often misunderstood and considered frightening by the community. (Marahatta et al., 2018; Tabah et al., 2018) This disease is still associated with unwanted social stigma that greatly impacts patients' physical abilities, economy, and social life. (Rao & Suneetha, 2021; Govindharaj et al., 2021). The management of leprosy requires a holistic approach based on evidence-based medicine with the principles of patient-centered care and a family approach in accordance with the Indonesian Medical Competency Standards (SKDI). (Rather et al., 2022; Sserunkuma et al., 2024) This case report aims to analyze the application of family doctor services in the comprehensive management of leprosy, identify risk factors, and evaluate management strategies that cover medical and psychosocial aspects. (Marciano et al., 2018; Nardi et al., 2023) The results are expected to improve the quality of life of patients while strengthening the prevention system at the community level. (Ahmad & Katoch, 2021; Prakoeswa et al., 2025).

The scientific contribution of a holistic approach to leprosy management compared to a medical-only approach lies in achieving comprehensive outcomes beyond bacterial eradication. While pharmacological multidrug therapy (MDT) effectively cures the infection, a holistic approach that integrates medical, psychosocial, and rehabilitative interventions addresses the multifaceted impact of leprosy on patients' lives. Holistic management prevents permanent disabilities through early nerve damage intervention and physiotherapy, tackles social stigma and psychological distress that impair treatment adherence and quality of life, and facilitates social and economic reintegration—factors that medical-only approaches cannot address. As evidence from Rao & Suneetha (2021) and Govindharaj et al. (2021) demonstrates, social stigma significantly impacts patients' physical abilities, economy, and social life, while Rather et al. (2022) and Sserunkuma et al. (2024) emphasize that evidence-based management requires patient-centered care and family approaches. The scientific contribution is therefore that a holistic approach substantially reduces disability-adjusted life years (DALYs), improves long-term quality of life, increases treatment adherence through comprehensive support systems, and prevents the socioeconomic burden of untreated disabilities in endemic communities like Grobogan Regency, whereas medical-only approaches, despite achieving microbiological cure, leave patients with unresolved nerve damage, psychological trauma, and social marginalization that perpetuate disability and community transmission risks.

RESEARCH METHOD

This case report employed a descriptive case study methodology to analyze the comprehensive management of leprosy using a family medicine approach. The study was conducted in Kabupaten Grobogan, Indonesia, where leprosy remains an ongoing public health concern with a prevalence of 3 per 100,000 population. A single patient case with confirmed diagnosis of Morbus Hansen was selected based on clinical presentation and diagnostic criteria consistent with leprosy classification. Primary data were collected through structured interviews and anamnesis to obtain detailed patient history, demographic information, and disease-related characteristics. Comprehensive physical examination was performed to assess skin lesions, peripheral nerve involvement, and

disability status according to WHO leprosy classification standards. Home visits were conducted to evaluate the patient's living environment, socioeconomic conditions, and family support systems, which are essential components of family-centered care. Data collection focused on both clinical and psychosocial aspects, including the patient's understanding of the disease, medication adherence, and family involvement in treatment. A holistic diagnostic evaluation was performed using evidence-based medicine principles, encompassing the initial assessment phase, intervention process, and outcome evaluation. Management was tailored according to WHO multidrug therapy (MDT) protocols while integrating patient-centered and family-oriented approaches. The analysis evaluated the effectiveness of comprehensive management in improving clinical outcomes and quality of life.

The assessment parameters used to evaluate changes in clinical, psychosocial, and quality of life conditions during the intervention process encompass multiple dimensions: clinical parameters including skin lesion characteristics, peripheral nerve involvement measured through monofilament testing and sensory function, WHO disability classification (Grade 0-2), bacillary load via slit-skin smear microscopy, treatment compliance with MDT regimen, and monitoring for lepra reactions; psychosocial parameters including patient's disease understanding and perception, psychological status (anxiety, depression, emotional distress), perception of social stigma and discrimination, level of family involvement and support, identification of medication adherence barriers, and assessment of coping mechanisms; and quality of life parameters encompassing functional ability and activities of daily living capacity, physical disability impact on work and social activities, changes in economic status and employment, social participation and community relationships, psychological well-being and self-esteem, family dynamics and mutual support, and community reintegration and acceptance. Additionally, home visit assessments evaluate the patient's living environment, hygiene and sanitation conditions, socioeconomic circumstances, availability of family support systems and caregivers, and family health literacy regarding leprosy prevention. These comprehensive, multi-dimensional parameters enable systematic evaluation of whether the holistic, family-centered approach achieves not only microbiological cure and clinical improvement but also functional recovery, psychological adaptation, social reintegration, and sustainable quality of life improvements throughout the intervention process.

RESULTS AND DISCUSSIONS

Result

The relationship between home environmental factors, sanitation, and housing density with the risk of disease transmission in leprosy is significant and multifaceted, as demonstrated in Mr. S's case where his home measured only 10 x 12 meters with inadequate ventilation, limited lighting through doors only, plywood partitions with curtains separating bedrooms, uncovered water bathtubs, and a squat toilet draining into a communal septic tank. These suboptimal environmental conditions directly facilitate Mycobacterium leprae transmission through prolonged exposure, as Mr. S admitted to still sleeping with his wife despite his infectious status, and the poor sanitation—including lack of proper ventilation, accumulated trash burned behind the house, and communal waste management—creates conditions where the bacteria can persist in the respiratory secretions and aerosol droplets in the confined household space. Housing density and overcrowding intensify this risk, as the patient's family of four living in close quarters with inadequate room separation increases the frequency and duration of close contact necessary for airborne transmission of M. leprae, particularly in poorly ventilated spaces. Furthermore, low socioeconomic status—as evidenced by Mr. S's family's monthly income of only Rp 800,000 as a farm laborer—limits their ability to maintain proper sanitation, invest in home improvements for better ventilation and lighting, ensure adequate nutrition that strengthens immune function, and access preventive health services, all of which interconnectedly reduce immunity and increase

susceptibility to infection among household contacts. Studies cited in the discussion demonstrate that individuals with low economic status have up to 6.3 times higher risk of leprosy infection compared to those with better economic conditions, and this heightened risk is substantially mediated by poor environmental conditions, inadequate sanitation practices, and high housing density that facilitate prolonged exposure to infectious agents in confined living spaces, highlighting why community-level interventions addressing housing, sanitation, and socioeconomic determinants are essential complements to individual MDT treatment for effective leprosy control and prevention.

Mr. S, 41 years old, complained of red spots all over his body that he had experienced since a year ago. Initially, his skin felt dry, then turned red and became more numerous. The red spots first appeared on his face and then spread throughout his body. When touched, the patient said it felt thick, and his legs and hands felt sore and stiff, causing him to walk like a robot. The red spots produced only a small amount of sweat.

The patient reported that the earlobes appeared thickened and reddened, with occasional fever and decreased appetite, resulting in weight loss. When closing the eyes, the right eyelid could not close completely. The patient denied having blurred vision. Initially, the patient felt that treatment was unnecessary because it was just a common skin condition, but the numbness and pain worsened until sores appeared on both elbows, prompting the patient to seek treatment at the Jumo Auxiliary Health Center. The patient believed that these symptoms were caused by diabetes, but blood sugar tests showed normal results. After several treatments with no improvement, the patient finally consulted the Kedungjati Health Center. The Kedungjati Health Center doctor suspected leprosy and initiated leprosy treatment at the Kedungjati Health Center. The patient stated that five years ago, while working on a project in Jakarta, a colleague on the same project had similar complaints. The patient currently works as a casual laborer.

The patient has no history of hypertension or diabetes mellitus. The patient has smoked since a young age and continues to do so. The patient reports smoking approximately 10 cigarettes per day. The patient denies any history of alcohol or illegal drug use. The patient rarely exercises, and physical activity has become increasingly limited since experiencing pain and stiffness in the legs.

The patient is married and has two children. Currently, the patient is not working due to illness, so his daily needs are provided by his wife, who works as a farm laborer. The patient's first child is 16 years old and the second child is 10 years old. The patient has good relationships with family members and the surrounding community. The patient's family is considered harmonious. Efforts to maintain the health of the patient and his family are still lacking because treatment is only sought when there are complaints. The patient said that when he is sick, he seeks treatment at the Jumo Auxiliary Health Center, which is closer to his home, and usually travels there using his private vehicle (motorcycle). However, if he does not improve, he seeks treatment at the Kedungjati Health Center. The patient and his family's knowledge about leprosy is still lacking, so they do not pay attention to clean and healthy living patterns. During the visit, the patient admitted that he still sleeps with his wife.

Physical examination revealed mild illness, blood pressure 128/72 mmHg, pulse rate 88 beats per minute, respiratory rate 20 breaths per minute, temperature 36.8°C. Weight 55 kg, height 166 cm. Body mass index (BMI) 20 kg/m2 (normal). Dermatological status on the face showed wrinkles and folds with leonine facies, madarosis on the left eyebrow, and cauliflower ear on both earlobes. On the dorsal region of the right and left hands, there were multiple ulcerative efflorescences with clear boundaries, irregular edges, granulation tissue at the base of the ulcer, a diameter of 1-1.5 cm, and covered with a brownish crust. Neurological examination revealed thickening of the left ulnar nerve and the right and left common peroneal nerves, accompanied by tenderness. Sensory examination showed decreased sensation of touch, pain, and temperature in some lesions on the right and left hands.

Figure 1. Patient's initial condition

The patient's family structure is a nuclear family consisting of the patient, his wife, and their two children. Relationships between family members are good and close. Communication between family members is good and unrestricted. The patient and family have a good relationship with their neighborhood. The patient previously worked as a project worker but stopped working since becoming ill. His wife's monthly income as a farm worker is approximately Rp 800,000, which is used to meet their daily needs.

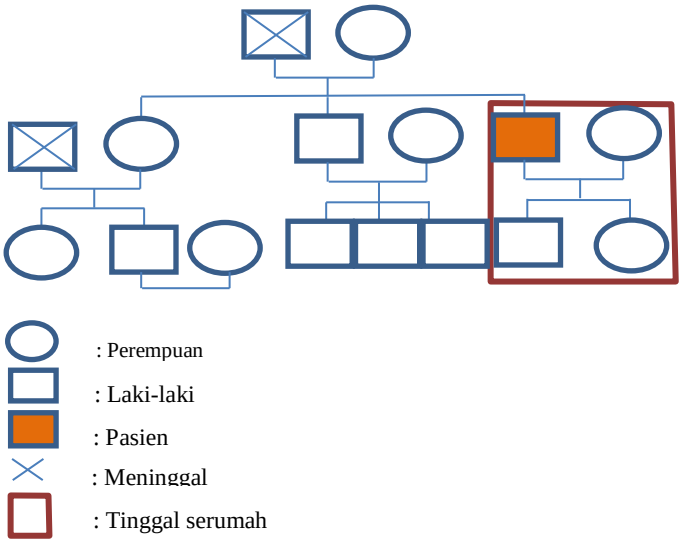

Figure 2. Mr. S's family genogram

The patient's house measures 10 x 12 meters and is shaped like a pyramid. The front and back yards are spacious, with wooden walls and dirt floors. The house has three bedrooms, a living

room, a kitchen, and one bathroom. The rooms are separated by plywood and covered with curtains. Each room appears messy but is reasonably clean. The roof is made of tiles and the ceiling has not been plastered. Lighting is limited to that coming through the doors as there is no ventilation. The house has electricity. Water for bathing and washing comes from a well. Drinking water comes from boiled well water. The bathtub contains uncovered water and the toilet is a squat toilet. Waste is drained into a communal septic tank, and trash cans are located in the kitchen and outside. When the trash piles up, it is burned behind the house.

Figure 3. Mr. S's house plan

Initial Holistic Diagnostics

The patient came to the clinic complaining of red spots appearing on his body with pain and wounds that would not heal. The patient thought these skin problems were caused by his diabetes. He hopes the disease can be treated and he can return to his normal activities. After examination and testing, the patient was diagnosed with Multibacillary (MB) Type Leprosy (ICD-10: A30). The patient did not have enough knowledge about leprosy, including what it is, what causes it, how it spreads, and how to prevent it. He also did not know that leprosy can cause disability. The patient was not aware of the importance of clean and healthy living habits. Because of his illness, he could not work well, which affected his family's income.

The patient's family only sought treatment when sick and did not focus on disease prevention. Family members did not know much about leprosy, including how to care for the patient and how to prevent disability. The community where the patient lives has negative beliefs and stigma about leprosy, which makes it difficult for the patient to accept his illness and follow treatment. The patient's functional level is Grade 2, which means he can still perform light work at home and in the community. This shows that the patient still has some ability to function, but he needs proper treatment to prevent his condition from getting worse.

Intervertion

The interventions provided to patients consist of medicinal and non-medicinal interventions related to leprosy. Medicinal management consists of red MDT drugs (Rifampicin 600 mg/month, Dapson 100 mg/month and 100 mg/day, Clofazimine 300 mg/month and 50 mg/day). Patients must take Rifampicin 600 mg, Clofazimine 300 mg, and Dapson 100 mg in front of a health worker on the first day of each month. Patients then take the remaining medication at home under the supervision of health workers and family members. Treatment lasts 12-18 months depending on the patient's clinical condition. After one week of taking the medication, the patient returned to the health center because the skin on his body was becoming increasingly red. Finally,

the doctor prescribed prednisone 40 mg (8 tablets) per day, which was taken for 2 weeks and then gradually tapered off. Two weeks after treatment, the patient felt better and decided to go back to work collecting freshwater clams in the river. Shortly thereafter, PMO (Medication Intake Monitoring) officers from the Kedungjati Community Health Center found that the patient's feet were covered in severe, wet wounds. The patient was asked to come to the Kedungjati Community Health Center for treatment, where his wounds were treated regularly every three days.

Non-medicinal family-focused interventions take the form of educating the patient's family about the definition, causes, symptoms, treatment patterns, control, and prevention of complications related to leprosy. Encouraging families to play a role in supervising patients when taking medication, reminding them to adopt a healthy lifestyle, and early detection of leprosy germs in families living with patients. Meanwhile, community-oriented interventions are carried out through education on prevention and transmission to others in the patient's neighborhood. Neighbors around the patient's home are given leprosy prophylaxis tablets in the form of 600mg Rifampicin. Eliminating the stigma associated with leprosy and encouraging social support for patients so that they continue to have the opportunity to work and socialize with the community.

Final Holistic Diagnostics

a. Personal Aspects, the patient's complaints have improved, the red spots have decreased, and the skin lesions have dried up. The patient now has a better understanding of his condition, which has reduced his anxiety. The patient has learned that his disease can be cured and controlled with regular treatment and by adopting a clean and healthy lifestyle. The patient hopes to return to work soon to provide for his family.
b. Initial Clinical Diagnosis: MB Type Leprosy (ICD 10-A30), Type 1 Leprosy Reaction
c. Internal Risk Factors, increased patient knowledge about the disease, including its definition, causes, treatment, prevention of transmission, and complications. The patient has begun to realize the importance of attending follow-up appointments at the health service.
d. External Risk Factors, the family has begun to realize the importance of going to a health facility to check their health. Increased family knowledge about the disease in terms of its definition, causes, symptoms, treatment, prevention of transmission, control, and complications. The patient's community understands leprosy and has eliminated the stigma associated with it, providing support to patients to continue participating in community activities.
e. Functional Scale, the patient's functional level is 2, meaning the patient can perform light daily tasks inside and outside the home.

Discussion

Hansen's disease (HD) or leprosy is a chronic infectious disease caused by Mycobacterium leprae, with a primary predilection for the skin and peripheral nerves (LAR et.al., 2023). The characteristic clinical manifestations of this disease are skin lesions accompanied by sensory disturbances to touch, temperature, and pain, which can be partial or total. This impairment occurs due to bacterial invasion and the host's immune response to the peripheral nerves, leading to progressive damage to the structure and function of the nerves (LAR et.al., 2023; Rahmi et.al, 2024).

In addition to skin abnormalities, leprosy patients often experience peripheral nervous system involvement, such as sensory dysfunction in the form of anesthesia, motor disorders such as deformities, claw hand, and drop foot, as well as autonomic disorders characterized by dry skin due to decreased sweat gland function (LAR et.al., 2023; Pratiwi, et.al, 2025). Clinical findings in this patient are consistent with this description, namely the presence of scaly black patches on both legs and feet, accompanied by numbness, thickening and dryness of the skin, darkening of the skin color, weakness of the lower extremities, and pain when walking (WHO, 2021; Mukti, et.al, 2024).

The World Health Organization (WHO) operationally classifies leprosy into two types, namely Pausibacillary (PB) and Multibacillary (MB) (WHO, 2021). Multibacillary leprosy is

characterized by more than five skin lesions, widespread and symmetrical distribution of lesions, skin infiltration or thickening, multiple peripheral nerve involvement, and positive bacteriological examination results. This type has a high bacterial load, resulting in a higher transmission rate compared to the paucibacillary type. (LAR et.al., 2023).

Neurological examination of the patient also revealed sensory disturbances in the form of anesthesia in both legs, as well as enlargement of the common peroneal nerve and bilateral posterior tibial nerves. With the combination of characteristic skin lesions, sensory disturbances, peripheral nerve involvement, and positive bacteriological results, a comprehensive diagnosis of multibacillary Hansen's disease can be made in this patient (LAR et.al., 2023; Rahmi, et.al., 2024).

The main treatment for leprosy is Multi Drug Therapy (MDT), which is a combination of two or more anti-leprosy drugs with complementary mechanisms of action. Rifampicin has a strong bactericidal effect against M. leprae, while dapsone (DDS) and clofazimine are bacteriostatic. This combination aims to prevent drug resistance, reduce the bacterial load, and break the chain of transmission (WHO, 2021; Rahmi, et.al., 2024). This patient was given rifampicin 600 mg per month, clofazimine 300 mg per month followed by 50 mg per day, and dapsone 100 mg per day. The duration of treatment ranges from 12 to 18 months according to WHO guidelines for multibacillary leprosy (WHO, 2021).

The success of therapy is highly dependent on patient compliance with long-term treatment and regular check-ups. Early discontinuation of medication or irregular consumption of medication can lead to treatment failure, disease recurrence, and an increased risk of drug resistance (Mukti et.al, 2024; Rahmi, et.al., 2024Therefore, educating patients about the importance of treatment compliance is a crucial aspect of leprosy management (Rahmi, et.al., 2024; Lukito, et.al 2024). In addition to MDT, this patient also experienced severe type 1 leprosy reaction, characterized by erythematous skin patches that were painful to the touch and accompanied by sensory disturbances. Leprosy reaction is an immunological response to M. leprae antigens and can cause acute nerve damage if not treated properly. In this condition, systemic corticosteroids in the form of prednisone at a dose of 6 × 5 mg per day were administered and gradually tapered off to suppress the inflammatory process and prevent further nerve damage.(5,9) (LAR et.al, 2023; Edelyne et.al, 2024).

Socioeconomic factors play an important role in the incidence and progression of leprosy. (Nery et al., 2019; Kerr-Pontes et al., 2004; Qian et al., 2025) Low economic status is closely related to low levels of education, unhealthy living environments, overcrowding, poor nutritional status, and limited access to health care facilities. (Sampaio et al., 2013; Heidinger et al., 2018) These interconnected social determinants create conditions that facilitate disease transmission and prevent early detection and treatment. (Wagenaar et al., 2015; Darmi et al., 2024) Understanding and addressing these socioeconomic determinants is essential for effective leprosy control and prevention at the community level (Rasolofozafy et al., 2025). Low-income limits people's ability to purchase nutritious food, which leads to a decline in nutritional status and immunity, thereby increasing susceptibility to infection. In addition, limited access due to distance and cost often causes patients to delay treatment or choose inadequate alternative treatments. Studies show that individuals with low economic status have up to 6.3 times higher risk of being infected with leprosy compared to individuals with better economic conditions (Mukti, et.al, 2024; Pratiwi, et.al, 2025).

Adherence to treatment and monthly routine check-ups are key factors in preventing complications and drug resistance. Poor adherence can render treatment ineffective, increase morbidity and mortality, and add to the burden of healthcare costs.6,7 In addition, treatment failure can lead to permanent disability in the form of physical impairment, which has a major impact on patients' quality of life (Pratiwi, et. al, 2025).

Leprosy complications are mainly related to peripheral nerve involvement. Peripheral neuropathy in the extremities is also a common complication, causing loss of fine touch, pain, and

temperature sensation. This loss of sensory protection makes patients susceptible to repeated injuries, secondary infections, and even distal finger amputation. The mechanism of distal tissue loss is not yet fully understood and is thought to involve osteolytic processes due to chronic inflammation and nerve damage (LAR, et.al, 2023; Pratiwi, et. al, 2025).

CONCLUSION

Hansen's disease is a chronic infectious disease that remains a public health problem in Indonesia, especially in endemic areas. This disease not only has clinical effects in the form of skin disorders and peripheral nerve damage, but also causes significant psychosocial, economic, and social stigma if not treated adequately.

This case report shows that patients with multibacillary leprosy have characteristic clinical manifestations in the form of multiple skin lesions accompanied by sensory disturbances, peripheral nerve thickening, and positive bacteriological examination results. A comprehensive diagnosis through a holistic approach enables more targeted treatment planning.

The administration of Multi Drug Therapy (MDT) in accordance with World Health Organization guidelines, accompanied by management of leprosy reactions and strict monitoring of treatment compliance, has been proven effective in improving the clinical condition of patients and preventing disease progression and permanent disability. The success of therapy is greatly influenced by patient compliance, supervision of medication intake, and ongoing education.

A holistic, patient-centered, and family-oriented approach by family doctors plays an important role in improving patients' and families' understanding of leprosy, providing adequate treatment, and reducing stigma in the community. Interventions that cover medical, psychological, social, and environmental aspects have been proven to improve patients' overall quality of life.

Thus, leprosy management through an evidence-based family medicine approach focuses not only on curing the disease, but also on preventing disability, improving social functioning, and empowering patients and families as part of efforts to eliminate leprosy in the community.

The most relevant directions for further research to test the effectiveness of the family medicine approach in leprosy control at the community level should prioritize longitudinal community-based intervention studies comparing holistic family medicine approaches versus standard medical-only treatment with extended follow-up periods tracking clinical, psychosocial, and socioeconomic outcomes; family and household contact studies examining whether comprehensive family education, rifampicin prophylaxis, and family supervision reduce secondary case rates and identify barriers to family participation; community-level stigma reduction research using mixed-methods approaches to assess the impact of community education interventions on stigma, social acceptance, and occupational reintegration of patients; implementation science studies evaluating the feasibility, scalability, and cost-effectiveness of integrating holistic approaches into existing primary health care systems in resource-limited settings; socioeconomic determinant and environmental intervention studies through cluster randomized trials testing how housing improvements, sanitation access, and economic empowerment synergistically enhance outcomes when combined with MDT; patient and family empowerment research developing and testing culturally appropriate educational interventions to improve health literacy, treatment compliance, and disability self-management; integrated health worker training studies assessing the effectiveness of comprehensive training programs for primary health care workers in delivering evidence-based holistic care with measurement of competency acquisition and clinical outcomes; and disability prevention research evaluating early intervention strategies in preventing permanent disability and functional decline. The overarching research question should address how effective a comprehensive, family-centered, evidence-based family medicine approach is compared to standard management in achieving integrated outcomes of disease cure, disability prevention, psychosocial recovery, and community reintegration in

endemic populations, and what critical implementation factors, cost-effectiveness, and scalability requirements are necessary for adoption in resource-limited primary health care systems, thereby translating the demonstrated effectiveness of holistic approaches in individual case management into population-level impact on leprosy elimination in endemic regions like Indonesia.

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