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SYSTEMATIC REVIEW

Leprosy Stigma Post Elimination Era: A Systematic Review

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ABSTRACT

Introduction: Leprosy, an ancient communicable disease, was declared eliminated as a public health programme globally in 2000. However, despite the significant reductions in leprosy cases, and the achievement of post-elimination status in many regions, stigmatisation of leprosy persists despite commendable efforts to address it, which could hamper the road towards 'Zero Leprosy'. Hence, the purpose of this review was to investigate and improve the understanding of leprosy stigma and to develop interventions that can effectively reduce the prevalence of leprosy. **Materials and methods:** To identify relevant articles, we employed the SPIDER framework (Sample, Phenomenon of Interest, Design, Evaluation, and Research type). Our search was conducted on Scopus, PubMed, ScienceDirect, BMJ, and SpringerLink Databases following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The search strategy incorporated Boolean operators "AND" and "OR", connecting keywords leprosy, stigma, and post-elimination. **Results:** The review included five articles and used Joanna Briggs Institute (JBI) Critical Appraisal Tool to appraise. Most articles narrated the three main domains: causes, phenomenon, and impact. The three main attributes discussed were misconception of disease (60%), external stigma (60%) and social impact (100%) as the leading cause of stigma. **Conclusion:** This systematic review still finds and adds a wider aspect to leprosy stigma in the post-elimination era, which could impose severe repercussions in effective disease control programmes towards the goal of 'Zero Leprosy'. It recommends targeted actions aimed at individuals, communities, and institutions to counter stigma, including education, empowering those affected, involving communities, sensitising healthcare workers, and enacting supportive laws.

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Keywords: Leprosy, Stigma, Discrimination, Post-elimination, Systematic review

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INTRODUCTION

Leprosy is an ancient chronic infectious disease caused by Mycobacterium leprae which is transmissible via droplets, from the nose and mouth, during close and frequent contact with untreated cases. The bacillus multiplies slowly and the incubation period of the disease, on average, is 5 years. Symptoms may occur within 1 year but can also take as long as 20 years. Leprosy mainly affects the skin, peripheral nerves, mucosa of the upper respiratory tract and the eyes, and may cause permanent damage if left untreated. The disease is curable with multidrug therapy (1). There were 127 558 new leprosy cases detected globally in 2020, which includes 8 629 children below 15 years. The new case detection rate among the child population was recorded at 4.4 cases per million child population (1).

The introduction of multidrug therapy (MDT) for leprosy treatment in the 1980s substantially reduced the number of new cases, and leprosy was even declared eliminated as a public health problem globally in the year 2000, that is less than 1 case per 10 000 population (2). In the subsequent years, global leprosy strategies focused on reducing the disease burden, in terms of new cases with visible deformities. The ultimate vision of the strategy is to have a world without leprosy but its immediate goal is to further reduce the leprosy burden at global and local, in which the targets include (1) zero disability among new child cases; (2) reduction of Grade 2 deformity among new cases; (3) zero countries with legislation allowing discrimination and stigmatisation on the basis of leprosy (3). The WHO has identified the elimination of leprosy as a key objective and has emphasised the need to combat stigma and uphold human rights as part of this effort. However, these targets might be challenging to meet soon particularly in endemic countries with inadequate healthcare systems. With approximately over 200,000 new cases per year, globally, for the past decade, the disease's distribution is still broad, supporting these worries (4). This is largely because leprosy is still stigmatised and is difficult to diagnose and treat, perpetuating transmission (2). Leprosy is a complex condition as it not only affects patients physically, but it has social and psychological implications that must be considered if a cure is ever to be complete (5). Thus, historically leprosy has so always been linked to stigmatisation and prejudice.

The core focus of disease control programmes, case finding and case detection as well as the efficacy of treatment, are severely hindered by stigma (6). Various efforts have been undertaken to lessen the stigma surrounding leprosy. However, stigmatisation still occurs despite commendable efforts even in this post-elimination era (2,6–8). Therefore, the purpose of this systematic review is to further explore and comprehend the prevailing state of leprosy stigma in the post-elimination era, as well to investigate the overall and wider dimension of leprosy-related discrimination in relation to correlation with the causes, phenomenon and impact among different time and demographical settings to gain valuable insight and generate a better understanding of the current condition. In return, this could contribute to the development of tailored intervention to further reduce and abolish stigma and discrimination related to leprosy, effectively. By addressing this persistent challenge, we hope to facilitate the achievement of 'Zero Leprosy' and ensure that individuals affected by leprosy receive the support, understanding, and respect they deserve.

The aim of this review was to understand the existing state of leprosy stigma in the post-elimination era. The review also intends to investigate the broader dimensions of leprosy-related discrimination, including its causes, manifestations, and impact in various time periods and demographic settings. Through the extensive analysis, valuable insights will be gained, leading to a better understanding of the current situation. The goal is to use these insights to develop targeted interventions that can effectively reduce and eliminate the stigma and discrimination associated with leprosy. By addressing this persistent challenge, we hope to contribute significantly to the achievement of 'Zero Leprosy' and ensure that individuals affected by leprosy receive the support, understanding, and respect they rightly deserve. These efforts are vital for advancing disease control programs and fostering an inclusive society that promotes the well-being and dignity of all individuals affected by leprosy.

MATERIALS AND METHODS

The study approach was a comprehensive evaluation using descriptive reviews of some of the key results from research papers (articles) that address stigma and discrimination associated with leprosy in a post-elimination period. When evaluating and choosing research articles, the author followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. The PRISMA guidelines are a type of tool designed to help authors improve the calibre of the research articles they choose for systematic reviews, which consist of four stages (9).

Search methods

Development, testing and choice of search strategies
The following mnemonic Sample, Phenomenon of Interest, Design, Evaluation and Research type (SPIDER) was used (10). S is defined as leprosy patients as the target population of interest, PI as the aspects of stigma, stigmatisation, discrimination, or stereotypes related to leprosy, and D as questionnaire, surveys, focus groups and population studies as the designated research designs. E for the evaluation specifically focused on the post-elimination period and lastly R for the qualitative, quantitative, and mixed-method types of research. These criteria helped define the search strategy and guide the selection of relevant research articles. The reviewers of the study drafted and refined the search strategies, presumably using appropriate keywords and database-specific search syntax. Table 1 lists the final search methodology for the three databases. The final search results were exported into Excel for managing and organising the retrieved articles.

Source of search information
The following databases of Scopus, PubMed, ScienceDirect, BMJ and SpringerLink were last searched for all the records on 6th June 2022, to identify potentially relevant articles following the PRISMA guidelines.

Search strategy
Using the common Boolean operators "AND" and "OR" and their equivalent words from the Medical Subject Heading (MeSH), the strategy for the literature search included keywords that were connected to the topic and title of the research. The keywords used on the five databases' search boxes, along with the filters applied, are "leprosy" OR "Hansen" AND "disease" OR "stigma" OR "stigmatisation" OR "discrimination" OR "stereotype" OR "social exclusion" OR "negative AND attitude" AND "post-elimination" is used. The following keywords were used on the five database's search box and filtered using the parameters.

Inclusion and exclusion criteria
Articles were included if they were (a) focused on stigma and discrimination related to leprosy, (b) published between 2017 and 2022, (c) written in the English language, (d) had a full-text version of the studies

available, and (e) utilised qualitative, quantitative, or mixed methods.

Articles were excluded if the (a) date of publication before 2017, (b) studies published in languages other than English (while translation software could have been used to translate articles, not in these languages, the authors were not confident of detecting linguistic nuances when reviewing studies in other languages), (c) study protocols, (d) pre-prints or unpublished articles, (e) short communications, letters, editorials or commentaries, and (f) systematic reviews.

These criteria were applied to select articles that met the specific requirements of the study and ensured that the included articles were relevant, recent, and available in English. Excluding certain types of articles, such as systematic reviews or short communications, helps maintain the focus and integrity of the systematic review process.

Search outcome and audit trail

The PRISMA diagram, which has four steps, was used in the article selection procedure in a spreadsheet and categorised them. It is shown in Figure 1. Initially, the research team combined the number of articles from all database searches throughout the identification stage. The authors define the research question and develop a comprehensive search strategy to identify relevant research articles. Two members of the research team (G.G. and S.M.) independently decide at the screening step of the process based on the articles' titles and abstracts. In the screening stage, articles were either included or eliminated depending on whether they satisfied the inclusion criteria. Any discrepancies or disputes were settled through discussion or a third reviewer. The research team chooses among articles with the entire text in the third step of eligibility. The inclusion criteria were met by the articles, while those that weren't were excluded. Additionally, the methodological quality of the publications that had undergone full-text reviews and met the inclusion criteria was evaluated. The reasons for excluding articles were recorded, and the final list of included articles was reported. In the fourth step, systematic reviews of articles that were pertinent to the study's topic and title were conducted (11). For simple data management and to assess the abstract titles, all search result articles were exported to the programme bibliography using Mendeley. Besides that, the included articles were then critically appraised using the appropriate tools. Three other research members (P.D., M.H., and K.N.) separately conducted a re-evaluation of the articles as part of the article selection process, beginning with the identification, screening, and eligibility stages. The next stage was to independently extract the obtained data from each study following the criteria in this systematic review after this procedure was finished and the findings of the studies that met the criteria were received.

Quality appraisal

Two independent researchers (S.M. and P.D.) assessed the quality of all five studies using the Joanna Briggs Institute’s (JBI) Critical Appraisal Guidelines. The team resolved any discrepancies through discussion and consensus. We evaluated the methodological quality of the articles in this systematic review using the JBI Critical Appraisal Tool. This tool assesses the character of a research paper and enables us to appropriately weigh the findings of each study in the synthesis of the results. We use the JBI Critical Appraisal Tool to evaluate the methodology of an inquiry and to establish the extent to which problematic tendencies have been addressed in its strategy, intervention, and inquiry (11). We accorded more weight to studies that met high methodological standards, ensuring a balanced and accurate representation of the available evidence. The JBI Critical Appraisal Tool is customised to match the nature of the research being conducted, including instances like qualitative research that employ a checklist. The JBI tool facilitated the evaluation of factors such as the appropriateness of the research design, the rigour of data collection methods, the transparency of data analysis, the reflexivity of the researchers, and the clarity of the findings. These allowed for an in-depth assessment of the trustworthiness and relevance of the qualitative studies included in our systematic review. We assessed the quality of the articles using ten predetermined checklist items. The criterion assessment is given a score of yes, no, unclear, or not applicable, with each criterion with a yes score receiving 1 point, and the others receiving 0. Each examination score is then calculated and summed up before being graded on a percentage basis. We utilised the JBI Checklist for Cross-Sectional Studies for the qualitative research. We meticulously appraised each selected study to assess the clarity of research questions or objectives, the appropriateness of the study design, the robustness of the sampling method, the adequacy of data collection methods, the appropriate statistical analysis, and the consideration of potential biases. By utilising the tool, we aimed to identify studies with methodological strengths and limitations, which in turn contributed to a comprehensive understanding of the overall body of evidence. A similar criterion assessment score is employed; however, the quality assessment of the articles is conducted using eight predetermined checklist items. This rigorous evaluation using the JBI Critical Appraisal tool contributes to the robustness of our systematic review and strengthens the validity of the conclusions drawn from the collective body of evidence.

RESULTS

The initial search found 131 articles. After eliminating duplicate entries, we identified the titles and abstracts of the remaining records, which we screened for relevancy to the topic, through the searches before removing duplicate records. As a result, 96 articles were excluded based on their lack of relevancy (Figure 1). After completing the screening process, we assessed the remaining five articles for eligibility. Ultimately, we included those five papers for the systematic review since they all satisfied the qualifying requirements.

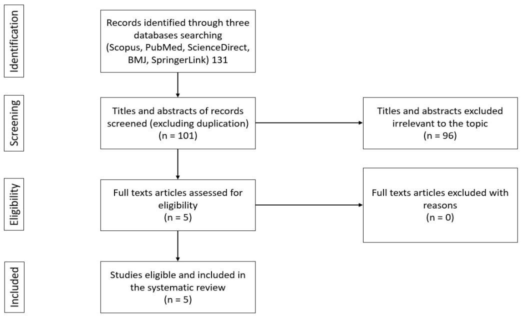

Figure 1: Flow chart of study selection using PRISMA.

The five studies included in this review were published between 2019 to 2022, with a collective focus on leprosy stigma in the post-elimination era. Of the selected five articles, two studies used quantitative methods, two were qualitative studies, and one mixed-method study. Notably, the studies were concentrated in India and Nigeria, reflecting a regional emphasis. The study sample sizes exhibited a range from 47 to 446 participants, contributing to a comprehensive representation of perspectives. Table I summarises the overall features of the five studies general features.

Table I: Overview characteristics of the five studies.

No	Author (year) / Country	Title	Study Design	Instruments	Study Population
1	Reddy et al. (2022) / India	Awareness of Leprosy in an urban slum of Western Maharashtra Post 35 years of the National Leprosy Eradication Program (NLEP)	Qualitative		Community members
2	Ebenso et al. (2019) / Nigeria	Changing stigmatisation of leprosy: an exploratory, qualitative life course study in Western Nigeria	Qualitative	Semi-structured interview	Individuals Community members
3	Shah et al. (2021) / India	Health burden of Hansen's disease in central India: A 4-year retrospective study	Quantitative		Individuals
4	Williams et al. (2019) / India	Study of Clinical Spectrum and Factors Associated with Disabilities in Leprosy: A Ten Year Retrospective Analysis	Quantitative		Individuals
5	Van't Noordende et al. (2019) / India	The role of perceptions and knowledge of leprosy in the elimination of leprosy: A baseline study in Fatehpur district, northern India	Mixed methods		Individuals Community members Healthcare workers

Individuals = people affected by leprosy.

The study employed a theme analytic technique to analyse the stigma and discrimination related to leprosy. These resulted in the identification and classification of themes into domains of causes, phenomena, and impact as shown in Table II. These findings underscore the multifaceted nature of factors contributing to leprosy stigma. Furthermore, all included studies consistently highlighted the profound social impact of stigma connected to leprosy.

Table II: Overview of the domains of the five studies.

No	Author (year)	Domains							
		Causes				Phenomenon		Impact	
		Misconception of disease	Physical disability	Religion and cultural beliefs	Misleading information	External stigma	Internal stigma	Social	Health
1	Reddy et al. (2022)	✓				✓		✓	
2	Ebenso et al. (2019)	✓		✓	✓	✓	✓	✓	
3	Shah et al. (2021)		✓			NA	NA	✓	
4	Williams et al. (2019)		✓			NA	NA	✓	
5	Van't Noordende et al. (2019)	✓		✓		✓	✓	✓	✓

NA = not available.

Stigma and discrimination towards leprosy

Causes

Among all the studies, the misconception of the disease was the most attributed cause of stigma related to Leprosy. One of the studies reported that the disease is caused by an unclean environment and was said to be hereditary. Furthermore, the disease was said to be transmitted also via touching, thus prompting the community to isolate patients with leprosy. Thus, the lack of education and knowledge on leprosy was one of the major drives leading to misconception, which further influence the individual perceived stigma and fear of contagion in the community.

External manifestation or physical disability due to leprosy was mentioned as another type of cause. Leprosy individuals will experience greater stigma, which will be more severe, the more obvious deformities, skin ulcers and impairment they have. People with leprosy are frequently excluded from their communities, public spaces, and transportation when others saw their deformities resulting in low self-esteem and low social interaction.

Two studies also mentioned that the causes of stigma on leprosy were due to religious and cultural misbeliefs. They believed that leprosy was incurable and was brought on by paranormal events, Gods anger or divine retribution for their offences, which resulted in social segregation and trouble interacting.

Interestingly, one study described how the information on leprosy that they were exposed to through health promotion messages embedded in primary school children during their previous years, which mentioned leprosy taboos and behavioural prohibitions that they should adhere to, and also via leprosy campaigns in their earlier years which used strong words to describe leprosy such as dangerous, highly contagious disease via touching, had instilled fear and apprehension towards the disease. Hence, this causes stigma to arise among people with leprosy.

Phenomenon

The phenomenon described in this study refers to the manifestations of stigma which had been broadly categorised into two categories namely external stigma and internal stigma. Leprosy patients and even the people who care for them, according to external stigma, are excluded and avoided by the community. Other people were afraid to be near them. One study mentioned that having leprosy was a symbolic association with filth and immoral behaviour which stains the identity of the community. Leprosy is also seen as the most dreaded condition that threatens communal survival, leading to the exclusion of leprosy patients from the community. Leprosy patients even after initiating treatment, still refuse to visit them as they are unsure how to interact with them. Besides that, higher stigma is related to a person who knew a leprosy patient.

Internal stigma refers to people’s experiences and perceptions of leprosy, particularly their reluctance of exposing their affliction for fear of how others may respond. This is where persons with leprosy anticipate being excluded from the community. They would rather not have others know they have leprosy, as they thought they have less respect due to the illness.

Impact

The impact is the consequences of stigma which can be serious and devastating. All five articles mentioned social impact as the main cause. This includes social isolation, relationship problems including expulsion of family members and relatives especially those who have deformities, and reduced employment opportunities were highlighted. Because of the influence of stigma, persons with leprosy have significantly lower work opportunities, as they were seen as not being able to contribute back to the community, which worsened their already constrained economic condition. Besides that, health is one of the apparent impacts of stigma towards leprosy. And this is mainly seen in their delayed health-seeking behaviour which led to delayed treatment due to the prejudice that they perceived, leading to a higher prevalence of disability among leprosy patients.

DISCUSSION

Overall, this systematic review only elucidated five studies. The generation of a smaller quantity of studies included in this study was due to the inclusivity of the keyword post-elimination. Not many studies emphasised the current phase, programmatically. The selection of a smaller number of articles suggests a focused and targeted approach to address the specific research question which leads to a deeper understanding related to leprosy stigma and discrimination in the post-elimination period. Furthermore, there was a higher homogeneity in terms of the study populations involving individuals with leprosy. Based on the appraisal, the five studies are of high methodological quality and relevance, which had a significant impact on the overall conclusions in a smaller review.

Adhikari et al came to the conclusion that leprosy would gradually lose its social stigma and prejudice over time (12). The findings of this study, however, indicated that stigma related to leprosy is still widely experienced across various temporal regions and cultures between the years 2019 and 2022. Three studies revealed three different manifestations of stigma whereby social impact was highlighted. It's important to note that the reduction of social discrimination and stigmatisation towards leprosy over time can be influenced by a variety of factors, including cultural, social, and economic contexts.

One of the glaring similarities among the studied articles were that the study sites were among the 15 nations with the greatest contributing number of leprosy cases i.e. Nigeria and India (13). Factors such as poverty, overcrowding, inadequate healthcare infrastructure, and limited access to healthcare services can contribute to the persistence of leprosy transmission. However, India and Nigeria have made significant efforts to improve leprosy detection and diagnosis through various programs and initiatives (14,15). As a result, although leprosy stigma still prevails, a larger number of cases may be detected and reported in these countries compared to others with less robust detection systems. In Nigeria, a participatory training intervention was used to design particular skin procedures along with instructional modules for community and primary level healthcare workers for prompt case finding, referral, and management of skin neglected tropical diseases (NTDs) (16). This comprehensive approach that focuses on raising awareness among the community about the signs and symptoms of leprosy, encouraging individuals to seek healthcare promptly when they notice these signs, and ensuring accessible and quality healthcare services for early diagnosis and treatment. This will facilitate early detection and initiation of treatment due to the socioeconomic factors faced there. The training materials were successful in not only raising awareness about NTD symptoms but also in facilitating the referral of individuals to appropriate management facilities for further care. Stigma associated with leprosy can impact individuals' willingness to seek timely diagnosis and treatment. The simplicity of the training materials likely played a key role in their effectiveness. This approach helps to ensure that individuals from diverse backgrounds and educational levels can comprehend the content and retain the knowledge.

This review sheds light on how culture and broader social elements including social structures, legislation and exterior influences affect how different individuals perceive and respond to stigma concerning leprosy. Leprosy may be perceived differently between uneducated and educated leprosy-affected people which highlights the lack of education or knowledge as one of the drivers of misconception of the disease leading to stigma (17–19). The lack of accurate information about the disease, its causes, and its transmission can lead to fear and discrimination. Furthermore, leprosy has a long history of being associated with fear, exclusion, and social ostracism in many cultures. Deep-rooted cultural beliefs and traditions can perpetuate stigmatising attitudes towards people affected by leprosy. Thus, accurate and evidence-based information about leprosy to dispel myths, misconceptions, and fears associated with the disease is the key solution. Educational campaigns can be targeted towards the general public, schools, healthcare providers, and policymakers to promote accurate information about leprosy transmission, treatment, and its curability (20–22). Incorporating leprosy education into the school curriculum to foster understanding and empathy from a young age could be a start (23). Health campaigns including health promotion and education have been one of the mainstreams towards empowering the community, however, providers should be wise and cautious in choosing appropriate terms to avoid misleading information (24). Healthcare workers' sensitisation by training them to deliver accurate information about leprosy to patients and their families in a sensitive manner has proven vital (25). Besides that, encourage healthcare workers to treat leprosy as they would any other medical condition, reducing discriminatory attitudes. The integration of leprosy treatment and care within general healthcare systems to reduce segregation and further promote the participation of individuals with leprosy in community activities and social events (26).

Leprosy can cause visible deformities, such as skin lesions and nerve damage, as well as disabilities can contribute to stigmatisation, as people may fear contagion or view those affected as "different" or "unclean." Although leprosy is not substantially contagious and can be effectively treated with multidrug therapy, the fear of contracting the disease persists. This fear can lead to social avoidance and discrimination towards individuals affected by leprosy (27,28). According to the Community-Based Rehabilitation (CBR) Matrix, there are five interconnected components: inclusive education, livelihood, health, social, and empowerment (29). These components work together to support the overall CBR strategy. For instance, the empowerment component plays a crucial role in raising awareness, advocating for the rights of people with leprosy, and promoting inclusive living. It helps overcome attitudinal barriers within the local community and influences policy development and implementation. This contributes significantly to addressing social barriers and promoting the rights and well-being of individuals with leprosy. The health component of CBR, particularly the provision of assistive gadgets, plays a crucial role in facilitating leprosy patients' recovery and preparation for education. For instance, the availability of a prosthesis can significantly enhance an individual's mobility, independence, and integration into school activities (30). By improving movement capabilities, assistive gadgets contribute to the overall rehabilitation process and support successful educational experiences by enhancing their mobility and autonomy in school settings. Apart from that, the establishment of supportive services like counselling and support groups for individuals affected by leprosy and their families to address mental health and psychosocial needs has proven a success in India (31–33). Furthermore, CBR emphasises the equal partnership of both the community and individuals in the rehabilitation process. It recognizes that the needs, priorities, and resources of the local community and persons with disabilities should be defined at the local level. The key focus areas in CBR include raising awareness to address attitudinal barriers, building the capacity of the local community, promoting participation, and providing referral services (34,35). Community engagement involves community leaders and influencers in awareness to create a supportive and sustainable environment by organising community dialogues and workshops to address stigma-related concerns and promote acceptance (12).

A significant delay in seeking medical attention, it can lead to several negative consequences, including the progression of the disease and the development of disabilities (36). By improving early identification and immediate treatment in leprosy can greatly diminished the impact of the disease and prevent long-term disabilities. Thus, one of the key points is strengthening healthcare systems as seen in India (26). Ensure the availability and accessibility of leprosy diagnosis and treatment facilities at primary healthcare centres and other relevant healthcare facilities. This includes providing them with the necessary skills and knowledge to conduct effective screenings. In addition, ensuring the availability of diagnostic tools and medications, and improving the referral system. Limited access to healthcare facilities, especially in remote or underserved areas, can contribute to patient delay. Factors such as distance, cost, and lack of healthcare infrastructure may hinder individuals from accessing timely diagnosis and treatment services.

Participatory landscape planning should also be included as a focus towards stigma reduction, which emphasises the engagement of local communities and various stakeholders who have a direct interest in or are affected by leprosy (37). This approach recognises the value of local knowledge, perspectives, and experiences, aiming to ensure that the planning and management strategies align with the needs, aspirations, and priorities of the community. Research has indicated that utilizing a Behaviour Change Communication (BCC) approach in development initiatives can empower communities to take ownership of projects, resulting in significant impact at the national level (38). Effective BCC should be research-based, focused on client needs, promote learning, establish connections between services, be professionally developed, and directly linked to behaviour change. Thus, a well-executed BCC approach, rooted in research and client-centric principles, can facilitate community ownership, knowledge transfer, and behaviour change, thereby contributing to broader national development goals. The key principle of participatory landscaping includes facilitating collaboration and partnership among governments, non-governmental organisations (NGOs), healthcare providers, researchers, and affected communities to work together in achieving the goal of ‘Zero Leprosy’. Furthermore, sharing best practices, resources, and experiences can lead to more effective interventions. By working together, resources can be pooled, and efforts can be coordinated to maximise impact.

Human rights are universal, and they apply to all members of the human family, regardless of gender, colour, or disability. There has been notable progress in the advocacy for the implementation and enforcement of policies that protect the rights of individuals affected by leprosy and prohibit discrimination. This includes laws against discrimination, equal access to healthcare, education, employment, and social services (39). By providing information, resources, and skills training to people affected by leprosy, enabling them to advocate for their rights and challenge stigma. The United Nations (UN) has established guidelines and principles, aligned with universal conventions to defend persons’ rights affected by leprosy, such as the Convention on the Rights of Persons with Disabilities (CRPD) (40). This includes their active participation in decision-making processes. Furthermore, the global community's vision for 2030, known as "leaving no one behind," incorporates the eradication of neglected tropical diseases (NTDs), including leprosy, as part of the Sustainable Development Goals (SDGs) (41). Collaboration with international organisations, governments, and NGOs to pool resources and knowledge for effective stigma reduction should be endorsed. Specifically, Goal 3, target 3.3 focuses on combating NTDs. These initiatives emphasise the commitment to eliminate prejudice and promote the participation of leprosy individuals while addressing leprosy eradication within the broader development agenda. Encourage affected individuals to share their personal stories to humanise the condition and counter stereotypes (32).

Lastly, conduct research to understand the root causes of leprosy stigma in different contexts and tailor interventions accordingly (42). Besides that, the regular collection of data on stigma prevalence and attitudes to measure the impact of interventions and to adjust strategies as needed. Overcoming leprosy stigma requires sustained effort, collaboration, and a combination of strategies, including individuals, communities, and institutions.

Limitations

The information contained in a few studies was insufficient to extract, however given the low number of papers available on this subject overall, we decided not to exclude these from the review. Furthermore, constrained by a search of literature produced during the post- elimination era. The inclusion of only English language articles might lead to missed information from other non-English language publications. To offer a comprehensive background of the present status of stigma associated with leprosy, the findings in this research may need to be supplemented by further information from various geographical places. Comments on significant correlation could not be determined due to a lack of analytical aspects in the articles.

CONCLUSION

Despite commendable efforts throughout the decades, there still occur stigmatisation related to leprosy post-elimination era. The findings and new evidence of the main causes, phenomena, or manifestations, and impacts of stigma were identified in this systematic study (review). The leading cause of stigma was the misconception of disease, external or enacted stigma was the main manifestation or phenomenon and often related to poor socioeconomic conditions, with social impact being the main implication of stigma seen in this study. If left unaddressed, stigma and discrimination towards people affected with leprosy could impose severe repercussions towards executing effective disease control programs towards the goal of 'Zero Leprosy'. Therefore, stigma reduction programmes should be tailored to the particular situation, society and individuals concerned. Furthermore, gaps in research on stigma reduction interventions should be a focus. Employment of mixed method approaches among leprosy patients, community, and healthcare workers to better understand and counteract the stigma. The introduction of positive norms or regulations that help those living with leprosy integrate into society should be considered.

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