Review Article

Health Education Method on Leprosy Prevention: Integrative Review

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ABSTRACT

Leprosy is still found mainly in lower-middle-income countries. Breaking the chain of leprosy transmission requires various ways, especially by increasing knowledge of leprosy prevention through health education. Although several studies have mentioned the effectiveness of health education, there is still uncertainty about the best method to use. Therefore, the review question should be answered: what forms of health education have been developed about Leprosy in the community? This review study complies with the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) version 2020. The search for relevant literature involved PubMed, ScienceDirect, ERIC, Cochrane, and ProQuest databases for the studies published in the 2000 to 2023 period with the inclusion criteria such as increasing knowledge, changing attitudes and behavior, and increasing positive stigma. The quality of the study was assessed using the Critical Appraisal Skills Program, and the Risk of Bias using the Cochrane RoB tool. Overall search on databases resulted in a total of 184,681 articles. Only six studies were eligible to be included in this review. Various educational methods were used in the eligible studies, including MH Mobile, the myth or truth on Leprosy game, posters, leaflets, community meetings, tele-education: the web, discussion lists, chats, activity diaries, iconographic 3D videos, classes on video streaming, video conference, case simulation, lecture, and the contact intervention (education, testimonies (direct contact), videos, and comics). All of the methods used had the potential to improve knowledge, attitude, and practice and reduce negative stigma regarding Leprosy. There is no method of health education superior to another on Leprosy prevention.

Keywords: Community, Health education, Leprosy, Patient, Stigma

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1. CONTEXT

Leprosy is an age-old disease described in the literature of ancient civilizations (1–3). This chronic infectious disease is caused by a type of bacteria called *Mycobacterium leprae* (4–6). The disease affects the skin, the peripheral nerves, the mucosa of the upper respiratory tract, and the eyes. Leprosy is curable, and treatment in the early stages can prevent disability. Apart from the physical deformity, persons affected by leprosy also face stigmatization and discrimination (7–9).

Leprosy is a neglected tropical disease (NTD) that still occurs in more than 120 countries, with more than 200,000 new cases reported annually. Elimination of leprosy as a public health problem globally (defined as a prevalence of less than 1 per 10,000 population) was achieved in 2000 (as per World Health Assembly resolution 44.9) and in most countries by 2010. The reduction in the number of new cases has been gradual, both globally and in the WHO regions. As per data from 2019, Brazil, India, and Indonesia reported more than 10,000 new cases, while 13 other countries (Bangladesh, Democratic Republic of the Congo, Ethiopia, Madagascar, Mozambique, Myanmar, Nepal, Nigeria, Philippines, Somalia, South Sudan, Sri Lanka, and the United Republic of Tanzania) each reported 1,000–10,000 new cases. Forty-five countries reported 0 cases, and 99 reported fewer than 1,000 new cases (10).

Breaking the chain of leprosy transmission requires various ways, among which is increasing knowledge of leprosy prevention through health education. Health education is necessary to avoid delayed diagnosis, treatment, and disability, as well as stigma caused by leprosy. The stigma of leprosy in society is still a scourge because it is considered a cursed disease, a disease of witchcraft, disgusting, and so on (11). Leprosy stigma can affect patient compliance with leprosy treatment. This stigma makes patients reluctant to seek treatment because of the fear of being ostracized by the society. This shows the importance of education about leprosy in supporting the leprosy elimination program (12). By conducting health interventions on all matters related to leprosy, it is hoped that it can change the community's negative perception (13).

Health education interventions are expected to increase knowledge, reduce disease burden, and promote health education to identify leprosy in the community. These interventions can be in the form of providing information about signs and symptoms, diagnosis, transmission, treatment, side effects, complications, and finding a place for treatment if suspected and stigmatized (14). Health education interventions, apart from providing the latest information, are also expected to develop or enhance existing knowledge. Leprosy health education interventions can be carried out in various forms, such as workshops, games, seminars, posters, community meetings, and more. The forms are tailored to the type of target (individual, group, or both), level of education, aspects to be achieved, methods used, and existing resources. The practice of health education is still the most important action in controlling leprosy (15,16).

However, effective health education for adolescents requires a multifaceted approach. Studies describe educational practices with adolescents involving workshops with educational games, which take into account the peculiar characteristics of this age group and make it possible to obtain knowledge in a relaxed way, enabling the communication and expression of ideas, promoting discussion and reflection among participants and strengthening the teaching and learning process (17,18).

This review is organized based on the question: what forms of education have been developed about Leprosy in the community.

2. Data Collection

Protocol

This review study complies with the Preferred Reporting Items for Systematic review and Meta-analysis (PRISMA) version 2020 (19).

Eligibility Study

The studies included in this study for analysis must comply with inclusion criteria, which include focusing on community groups or adults in groups or groups, demonstrating results on knowledge, attitudes, practices, and positive stigma. Only studies with intervention design, published in the 2000 to 2023 period, and in English were included. The feasibility of the study was prepared based on the questions and statements of the PICO statements as shown in Table 1.

Table 1. PICOS statement

Problem/patient/Population	Communities facing the Leprosy problem in their groups
Intervention	Health education about Leprosy to increase public knowledge and awareness using various learning methods/media
Comparison	Comparison with other methods of increasing public knowledge for changing stigma
Outcomes	Increasing knowledge, changing attitudes and behavior, increasing positive stigma
Study Design	All types of experimental studies (Randomized Trial, Quasi, Case-control)

Information Source

The search for relevant literature involved five databases commonly used for search, which have been recognized as reputable databases, including PubMed, ScienceDirect, ERIC, Cochrane, and ProQuest. A search of all databases was carried out from November 2022 to January 2023. Hand searching was carried out by browsing the bibliography of the relevant literature obtained.

Search strategy

Based on the research questions and the PICOS statement, the general keywords used to search each database consisted of Community, Leprosy, Health education, knowledge, attitude, practice, and awareness. The search for each database can be seen in Table 2. The arrangement of keywords in each database follows the MeSH terminology, and it will be different for each database. Boolean operators are used to complete keywords and make searching the database easier. The keywords used and the results obtained in each database can be seen in Table 2.

Selection Process

Two writers independently screened the titles and abstracts to suit the inclusion criteria, and in case of obscurities, they started reading the main text. No automation tools were used in the selection of the literature. A summary of the screening process is shown in Figure 1.

Data Extraction

To extract the required data, we followed the McMaster Critical Review Form-Quantitative Studies (version 2.0) and added some information that we thought was important. The extracted data included authors, countries, outcomes, study designs, participants, interventions, evaluation methods, and main findings. Two authors performed data extraction independently. The finalization of the extraction process was read and endorsed by the first author.

Quality Assessment

Study quality was assessed by two authors independently using the Critical Appraisal Skills Program (CASP) for the Randomized Controlled Trial (Critical Appraisal Skills Program, 2022). This tool consists of 11 items, which are divided into four sections with the choices of Yes, No, and Can't Tell checklist columns. We categorized the quality of studies into High, Medium, and Low. High-quality studies if you have answers YES 10–11/11, medium quality if you have answers YES 7–9/11, and Low quality if you have answers YES ≤ 6/11.

Risk of Bias Assessment

We assessed the risk of bias using the Cochrane ROB-2 tool (20), which uses the following five domains: randomization process, deviation from intended interventions, missing outcome data, outcome measurement, and selection of the reported result. The overall risk of bias rating is derived from the five individual ratings and determined by the ROB2 algorithm. The categorization of bias assessments for each domain includes High, Moderate, and Low. The presentation of the results of the bias assessment is displayed in the form of a traffic light plot from the RoB Visualization Tool.

Table 2. Search string in databases

Database	Keywords
PubMed	(((((("health education"[MeSH Terms]) OR ("education/prevention and control"[MeSH Terms])) OR ("education"[MeSH Terms]) AND ((y_10[Filter]) AND (ffrft[Filter]) AND (randomized controlled trial[Filter]) AND (fft[Filter]))) AND ((("leprosy"[MeSH Terms]) OR ("hansen disease"[Title/Abstract])) OR ("hansen disease patients"[Title/Abstract]) AND ((y_10[Filter]) AND (ffrft[Filter]) AND (randomized controlled trial[Filter]) AND (fft[Filter])))) AND (((((("knowledge"[MeSH Terms]) OR ("attitude"[MeSH Terms])) OR ("behavior"[MeSH Terms])) OR ("perception"[MeSH Terms])) OR ("stigma"[Title/Abstract]) AND ((y_10[Filter]) AND (ffrft[Filter]) AND (randomized controlled trial[Filter]) AND (fft[Filter])))) OR (community[MeSH Terms])
Sciencedirect	health education OR health campaign AND Leprosy OR Hansen disease AND Knowledge AND stigma
ERIC	(((((("health education"[MeSH Terms]) OR ("education/prevention and control"[MeSH Terms])) OR ("education"[MeSH Terms]) AND ((("leprosy"[MeSH Terms]) OR ("hansen disease"[Title/Abstract])) OR ("hansen disease patients"[Title/Abstract]) AND (((((("knowledge"[MeSH Terms]) OR ("attitude"[MeSH Terms])) OR ("behavior"[MeSH Terms])) OR ("perception"[MeSH Terms])) OR ("stigma"[Title/Abstract]) AND (community[MeSH Terms])
Cochrane	Health education OR Health campaign OR Education AND Leprosy OR Hansen disease AND Patient OR Community
Proquest	Health education OR Health campaign OR Education AND Leprosy OR Hansen disease AND Patient OR Community

3. Results

Overall, a search of databases resulted in a total of 184,681 articles. After removing 1,097 articles for duplication, ineligibility, and other reasons, 16,335 articles were left ready for screening. In the end, six articles were eligible to be included in this review study after removing 12 articles for reasons (e.g., non-intervention studies and case studies). The process of searching for studies is presented in Figure 1.

Characteristics of the Eligible Studies

We have collected six studies from several countries in the publication period from 2000 to 2023 (Table 3). The collected studies were intervention studies with various approaches. We focused on models or strategies developed to increase knowledge, attitudes, and practices, including increasing positive stigma among sufferers and society. We found that most of the studies came from Brazil (n=3), Indonesia (n=2), and India (n=1), respectively. The number of participants involved in the included studies was 1,803, from various backgrounds, ranging from leprosy patients and families to health workers caring for leprosy patients (Table 3).

Results of Study Quality and Bias Assessment

All the selected studies were screened against the eleven items forming the CASP method. The results of the screening are outlined in Table 4. From these results, all the eligible studies are in the medium quality category (7-9/11) (Table 4).

Based on the results of risk of bias analysis using the Cochrane RoB2 tool (20), two studies were found to be in the High Risk of Bias category, and the rest were in status with some concerns (Figure 2).

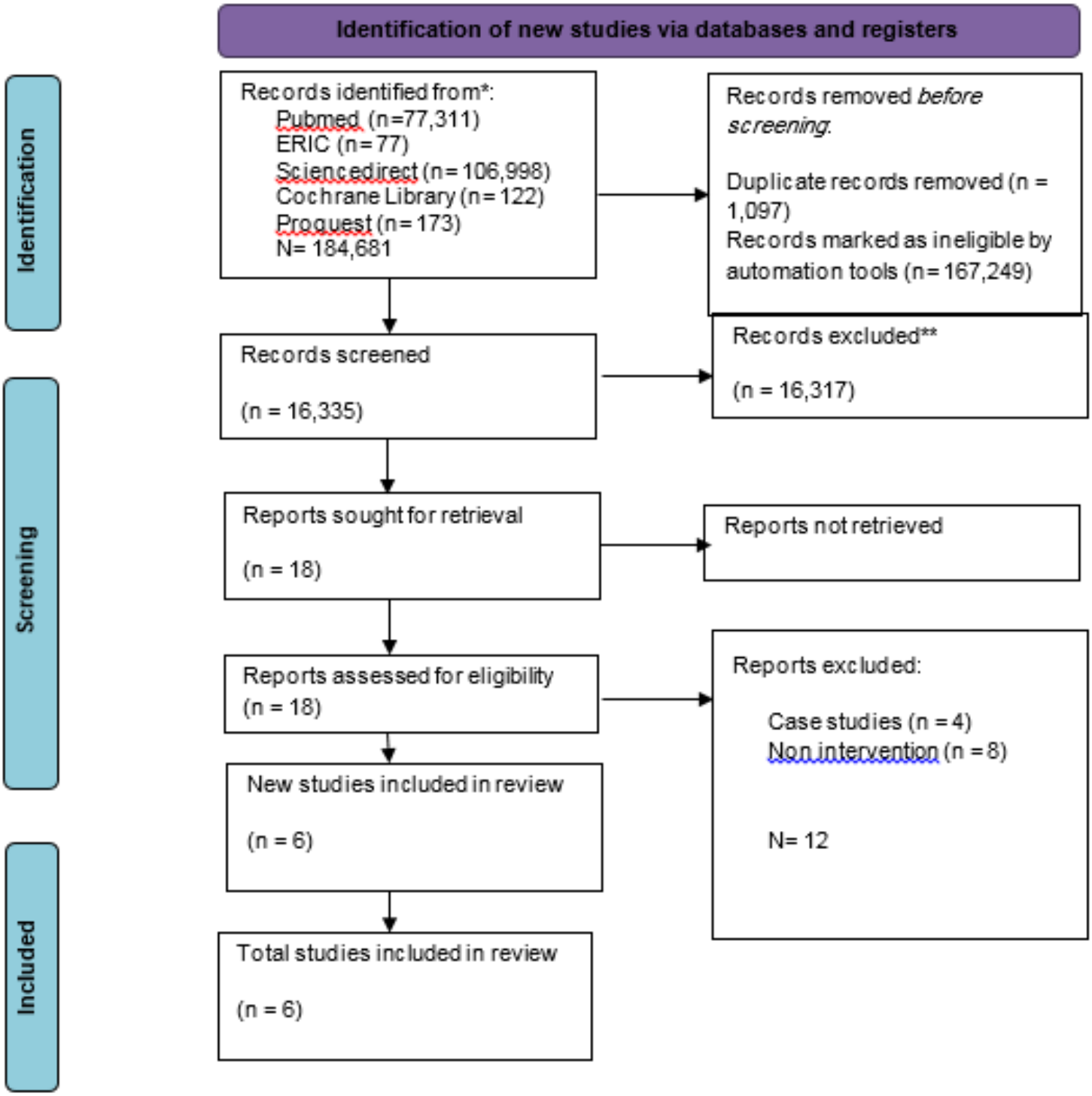

Figure 1. PRISMA Flow Diagram

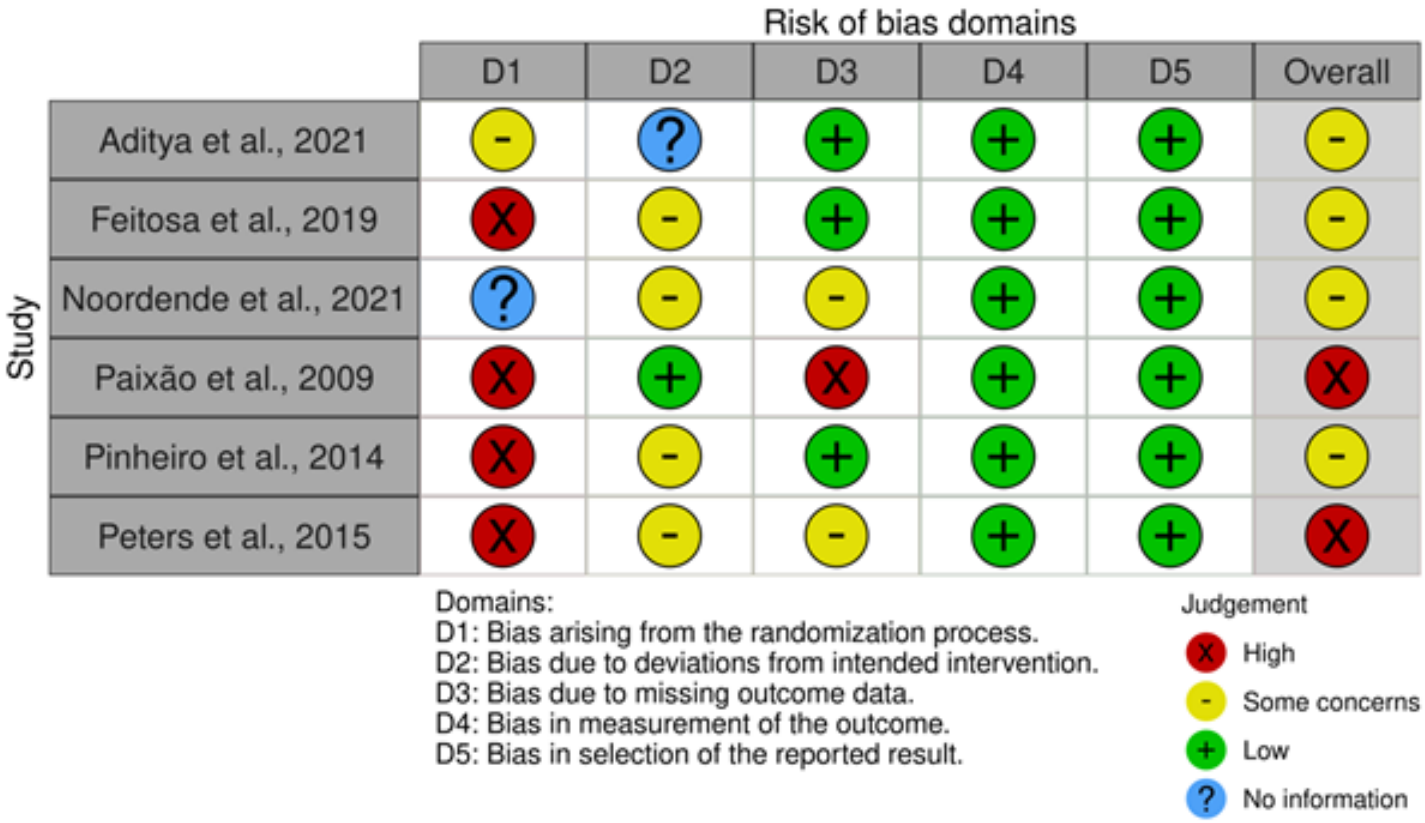

Figure 2. Traffic Light Plot for Risk of Bias Assessment

Health Education Intervention in Leprosy

Based on information from eligible studies included in this study, some of the interventions used were MH Mobile (21), the myth or Truth on Leprosy game (22), posters, leaflets, community meetings (13), tele-education: the web, discussion lists, chats, activity diaries, iconographic 3D video, classes in video streaming, video conference, case simulation (23), lecture (24), the contact intervention: education, testimonies (direct contact), videos, and comics (25). The health education strategy analyzed in each of the studies included in this study targets participants from leprosy sufferers, families or close contacts of sufferers, and health workers who were directly related to the treatment of leprosy sufferers. In general, implementing existing interventions increases knowledge, attitudes, and practices and changes the stigma about leprosy.

Effectiveness of the Health Education Model

In using MH Mobile, a significant increase was seen in knowledge (P=0.00) compared to the control group, who used books in the form of modules (P=0.006) (21).

The same was found in studies that conducted interventions using posters, leaflets, and community meetings. These interventions could increase the knowledge, attitudes, and practices of sufferers and families (13). Other studies using the lecture method and the contact intervention also showed increased knowledge and attitudes and reduced the negative stigma in society (24,25). Overall, no model or method was superior to other intervention methods in the several studies included in this review. All methods showed positive potential to increase knowledge, attitudes, and practices against leprosy, including changing the negative stigma among the community. This systematic review focused on the models or methods of delivering health education about leprosy developed in the last two decades. The intended outcome is an increase in knowledge, attitudes, and practices, which can then positively influence the positive stigma of leprosy sufferers. We managed to collect six health education intervention studies from several developing countries around the world. The search was conducted using several reputable databases to obtain high-quality studies. Based on search results from 2000 to 2023, health education intervention studies in leprosy cases are not being developed much anymore, even though this disease still cannot be erased from health report data worldwide, especially in countries with middle and lower economies.

Table 3. Data extraction of eligible studies

Author	Outcome	Design	Participant	Health education		Evaluation Method	Main Findings
				Intervention	Control		
Aditya et al., 2021, Indonesia	increase the knowledge and compliance	Quasi-experimental	35 intervention groups and 35 as control groups	MH Mobile	Book/module	Questionnaire	the MH Mobile significantly increased knowledge of participants (P value =0.000)
Feitosa et al., 2019, Brazil	preventing the disease and reducing stigma	pre-experimental study without control group	43 adolescents	The "Myth or Truth" on leprosy game	None	Educational Material Adequacy Questionnaire	increase in knowledge about leprosy (P 0.001)
Noordende et al., 2021, India	knowledge, attitudes and practices (KAP), stigma	pre/post intervention study	1067 participants in the first survey and 843 participants in the second survey	Posters, leaflet and community meetings	None	the Explanatory Model Interview Catalogue Community Stigma Scale (EMIC-CSS); the Social Distance Scale (SDS); in-depth interview	Increase knowledge, attitude and practices (P 0.001)
Paixão et al., 2009, Brazil	Motivational aspect of Family Health Team	Quasi-experimental	48 healthcare professionals, family health team	Tele-education: the Web, discussion lists, chats, activity diaries, iconographic 3D video, classes in video streaming, videoconference, and case simulation	None	The Web Site Motivational Analysis Checklist (WebMAC)	High motivational scores.
Pinheiro et al., 2014, Brazil	Knowledge	pre/post intervention study	200 high school students	Lecture: Health education in the classroom	None	Questionnaire	Increased in knowledge
Peters et al., 2015, Indonesia	Knowledge and attitude, reduce stigma	Cluster-randomized controlled intervention study	375 participants	The contact intervention: education, testimonies (direct contact), videos and comics	None	the Explanatory Model Interview Catalogue Community Stigma Scale (EMIC-CSS), social distance scale (SDS), 6-question questionnaire, FGD	knowledge about leprosy increased and that negative attitudes reduced (P<0.001)

Table 4. Summary of quality assessment

Questions	Aditya et al., 2021	Feitosa et al., 2019	Noordende et al., 2021	Paixão et al., 2009	Pinheiro et al., 2014	Peters et al., 2015
Did the study address a clearly focused research question?	Y	Y	Y	Y	Y	Y
Was the assignment of participants to interventions randomised?	Y	N	N	N	N	N
Were all participants who entered the study accounted for at its conclusion?	Y	Y	Y	Y	Y	N
Were the participants 'blind' to intervention they were given?	N	N	N	N	N	N
Were the investigators 'blind' to the intervention they were giving to participants?	N	N	N	N	N	N
Were the people assessing/analysing outcome/s 'blinded'?	N	N	N	N	N	N
Were the study groups similar at the start of the randomised controlled trial?	N	N	N	N	N	N
Apart from the experimental intervention, did each study group receive the same level of care (that is, were they treated equally)?	Y	CT	CT	CT	CT	CT
Were the effects of intervention reported comprehensively?	Y	Y	Y	Y	Y	Y
Was the precision of the estimate of the intervention or treatment effect reported?	N	N	N	N	N	N
Do the benefits of the experimental intervention outweigh the harms and costs?	Y	Y	Y	Y	Y	Y
Can the results be applied to your local population/in your context?	Y	Y	Y	Y	Y	Y
Would the experimental intervention provide greater value to the people in your care than any of the existing interventions?	Y	Y	Y	Y	Y	Y

Health education is a dynamic process of behavior change, where the change is not just a process of transferring material or theory from one person to another but a set of procedures or changes due to awareness within the individual, group, or society (26). Health education is given to the community in every life cycle (27). Health education interventions can be provided to all age groups to increase knowledge and change behavior in the community. Knowledge is a fact, truth, or information obtained through experience or learning that is known and realized by a person (28). Health education about leprosy is expected to increase knowledge so early diagnosis and appropriate treatment can be achieved to prevent disability and remove the stigma in society. Lack of knowledge about leprosy makes the prognosis worsen, especially because many infected people were misdiagnosed or did not seek treatment (29). Various ways of interventions are used in health education, such as posters, leaflets, conventional lectures, games, modules, and mobile MH, which are proven to increase knowledge and attitudes in societies. Posters and leaflets as learning media are commonly used in helping the learning process. Posters and leaflets as learning media are commonly used to help the learning process. A poster is a publication in the form of an image or text or a combination of both with a larger size than a leaflet. Posters can explain or express a concept or idea and deliver messages, ideas, and science-related issues (30). Several things need to be considered to get good results in making these various media, including the words, phrases, and tittles should be in a way to attract the readers' attention, and the display should contain attractive colorful images (31). The study by van 't Noordende et al. (32) reported that interventions using posters and community meetings could increase knowledge about leprosy and could change personal and community attitudes towards stigma or negative views of people with leprosy. The present study also explains that community meetings and group discussions yielded better results than the use of posters in terms of changing perceptions about leprosy and how to prevent it. There is a positive relationship between the number of posters seen and the level of knowledge and positive attitudes towards people who have experienced leprosy. If the public sees more posters, their knowledge increases and their attitudes become more positive. Leaflets as learning media are simpler and more concise than posters, can be distributed on various occasions, and do not require a long time to read. The drawback is that there are not too many writings, few supporting images, and limited information (16). In contrast with posters and leaflets, the module is a unified learning material that can be studied independently because it already contains clear contents and instructions so that it can be studied without needing a teacher. In modular teaching, the instructor is more of a facilitator and resource than just a conduit for passive knowledge transfer. Integrated modular teaching can be an effective addition to providing theoretical and practical knowledge to students (33). This is also showed in the research conducted by Aditya et al. (21) that using modules as learning media can improve knowledge. Other health education media related to technological advances such as educational games has also been widely used. Many previous studies have explained that motivation and learning efficiency can be increased through educational games. Most game-based studies focus on digital game-based learning (34). Feitosa et al. (22) explained that knowledge increased after intervention with board games on students. Similar to the study conducted by Sabirli & Coklar (35) that using educational games significantly increased students' knowledge. In addition to gaming technology, in modern times, Android technology has also developed widely. Almost everyone already has an Android device. Android application continues to grow rapidly worldwide, including in areas with minimal resources (36). Various kinds of android applications have been created and are increasingly relied upon by doctors, residents, and health educators in medical practice (37). These android applications facilitate providing information about leprosy to the public and shorten or reduce complicated procedures in public health services, especially during this COVID-19 pandemic. In the study conducted by Aditya et al. (21), a significant increase was observed in knowledge and medication compliance in the group using Mobile MH. The increase in knowledge was seen from the difference in the results of the pretest and posttest. This finding is in line with research conducted by Ratiyun et al. (38) and Alifariki et al. (39), which also showed a significant increase in knowledge after respondents were given health education through reading an e-book. Knowledge about leprosy is an important factor influencing the behavior of individuals, families, and even communities (40). Learning media is one of the benchmarks for learning success. It was unable to determine which interventions were more effective because of the limited number of journals, small number of respondents, and there is no long-term evaluation since the data were collected one time only during the time of the study. Ideally, educators are able

to create variety in delivering health education. This literature review only summarized six studies using health education interventions about leprosy; therefore, the conclusions presented by this study cannot determine which intervention is more effective and cannot be generalized due to the limited number of the included studies. It is necessary to carry out a long-term evaluation to see the effectiveness of each of these interventions because the assessment is carried out only once during the assessment.

4. CONCLUSION

Leprosy education interventions in the community resulted in increased knowledge, attitude, and practice about leprosy. This increased knowledge has been seen in general aspects of the diseases such as signs and symptoms, etiology, transmission, treatment, side effects, disease complications, seeking help in case of leprosy suspicion and helping in improving medication adherence, and eliminating stigma. An intervention is selected based on material, relevant topics, right on target, relatively inexpensiveness, and being easy to imitate. The combination of educational interventions provided needs to be considered which might give better results. Further and larger research is still needed to be conducted on the effectiveness of these interventions to increase knowledge about leprosy in the community.

Further research is needed, larger, and more in-depth on health interventions and the effectiveness of each of these interventions to increase knowledge, attitude and practice about leprosy in the community.

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Authors' Contribution

M.D contributed to data search, extraction, and analysis, and then drafted and revised this paper.

A.J contributed to data extraction.

S.H advised on data analysis and revised the paper.

G.P initiated the research, revised the paper, and approved the final manuscript.

Ethics

We hereby declare all ethical standards have been respected in preparation of the submitted article.

Conflict of Interest

The authors declare that they have no conflict of interest.

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