Review Article

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Analysis of interventions to reduce stigma related to mental disorder: a critical systematic review

Análise de intervenções para reduzir o estigma relacionado ao transtorno mental: uma revisão sistemática crítica

Análisis de las intervenciones para reducir el estigma relacionado con los trastornos mentales: una revisión sistemática crítica

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ABSTRACT:
Objective: This review aimed to find and assess mental disorder stigma management solutions. **Methods:** The PROSPERO review ID is CRD42022369853 and followed the PRISMA protocol. This review recruited language-neutral publications from Scielo, Medline (via PubMed), and Google Scholar from 2019 to 2023. Three psychiatrists helped with selection, data collection and analysis, risk of bias assessment, and methodological quality rating. The ROBIS instrument assessed systematic review bias, while the Cochrane Handbook for Systematic Reviews of Interventions assessed CT bias. Use the Oxford Centre for Evidence-Based Medicine's 2011 Levels of Evidence to evaluate methodological quality. Following peer review. **Results:** Thirteen articles addressed stigma therapies for mental diseases like depression, anxiety, bipolar affective disorder, and schizophrenia. Audiovisual tools, theoretical and practical classes, and clinical case discussions reduced stigma, with evidence levels of 2–3. Studies found various drawbacks: a) some research did not focus on stigma reduction; b) data reporting was restricted. **Conclusions:** These findings show that stigma-reduction treatments must be continual and successful across varied intervention groups.

Keywords: stigma, intervention, mental disorders, systematic review, psychoeducation

RESUMO:
Objetivo: Este estudo teve como objetivo encontrar e avaliar soluções para o gerenciamento do estigma em transtornos mentais. **Métodos**: O estudo PROSPERO ID é CRD42022369853 e seguiu o protocolo PRISMA. O

estudo recrutou publicações de linguagem neutra do Scielo, Medline (via PubMed) e Google Acadêmico de 2019 a 2023. Três psiquiatras auxiliaram na seleção, coleta e análise de dados, avaliação do risco de viés e classificação da qualidade metodológica. O instrumento ROBIS avaliou o viés de revisão sistemática, enquanto o Cochrane Handbook for Systematic Reviews of Interventions avaliou o viés de TC. Utilizamos os Níveis de Evidência de 2011 do Oxford Centre for Evidence-Based Medicine para avaliar a qualidade metodológica. Após revisão por pares. **Resultados**: Treze artigos abordaram terapias de estigma para doenças mentais como depressão, ansiedade, transtorno afetivo bipolar e esquizofrenia. Ferramentas audiovisuais, aulas teóricas e práticas e discussões de casos clínicos reduziram o estigma, com níveis de evidência de 2 a 3. Estudos encontraram várias desvantagens: a) algumas pesquisas não se concentraram na redução do estigma; b) o relato de dados foi restrito. **Conclusões**: Essas descobertas mostram que os tratamentos para redução do estigma devem ser contínuos e bem-sucedidos em diferentes grupos de intervenção.

Palavras-chave: estigma, intervenção, transtornos mentais, revisão sistemática, psicoeducação

RESUMEN:
Objetivo: Este estudio tuvo como objetivo encontrar y evaluar soluciones para la gestión del estigma en los trastornos mentales. **Métodos**: El estudio PROSPERO, con su ID CRD42022369853, siguió el protocolo PRISMA. Se reclutaron publicaciones de lenguaje neutro de Scielo, Medline (vía PubMed) y Google Académico entre 2019 y 2023. Tres psiquiatras colaboraron en la selección, la recopilación y el análisis de datos, la evaluación del riesgo de sesgo y la calificación de la calidad metodológica. El instrumento ROBIS evaluó el sesgo de las revisiones sistemáticas, mientras que el Manual Cochrane para Revisiones Sistemáticas de Intervenciones evaluó el sesgo de las revisiones de TC. Se utilizaron los Niveles de Evidencia de 2011 del Centro de Medicina Basada en la Evidencia de Oxford para evaluar la calidad metodológica. Tras la revisión por pares, se obtuvieron resultados. **Resultados**: Trece artículos abordaron terapias para el estigma en enfermedades mentales como la depresión, la ansiedad, el trastorno afectivo bipolar y la esquizofrenia. Las herramientas audiovisuales, las clases teóricas y prácticas, y las discusiones de casos clínicos redujeron el estigma, con niveles de evidencia de 2 a 3. Los estudios encontraron diversas desventajas: a) algunas investigaciones no se centraron en la reducción del estigma; b) el reporte

de datos fue limitado. **Conclusiones**: Estos hallazgos muestran que los tratamientos para la reducción del estigma deben ser continuos y exitosos en diversos grupos de intervención.

Palabras clave: estigma, intervención, trastorno mental, revisión sistemática, psicoeducación

Introduction

Stigma, from a historical and theoretical perspective, originates from the ancient Greek verb "stizo," meaning "to mark as a sign of shame, punishment, or disgrace," representing a socially undesirable characteristic. In contemporary society, stigma remains a prevalent issue, leading to discrimination and, consequently, a loss of dignity for individuals with mental disorders [1, 2, 3, 4, 5, 6, 7, 8]. This discrimination undermines the right to health, especially in nations with limited investment in mental health care, where people with mental disorders face higher morbidity and mortality rates compared to the general population [1, 2, 3, 4, 5, 6, 7, 8, 9].

Stigma negatively impacts mental health outcomes, including access to treatment, acceptance of therapeutic interventions, quality of life, and social inclusion. Societal and cultural stereotypes further perpetuate the marginalization of individuals with mental disorders, reducing their life expectancy and worsening their overall well-being. Research has shown that in countries with higher awareness of mental health, individuals are more likely to seek treatment [1, 2, 3, 4, 5, 6, 7, 8, 10].

Conversely, in low-resource settings, cultural beliefs and stigma contribute to a lack of recognition of mental health needs, preventing individuals from seeking the necessary care [1, 2, 3, 4, 5, 6, 7, 8]. Given the persistent nature of mental health stigma and its detrimental effects on individuals and society, this review seeks to address a crucial question: What are the most effective interventions for reducing and eliminating stigma associated with mental disorders? Understanding and implementing these interventions is essential for improving mental health care and reducing the social and economic burden of mental illness.

Then, the objective of this review is to identify and evaluate the effectiveness of interventions aimed at reducing and eliminating the stigma associated with mental disorders. This research aims to look at different methods that have been used to fight stigma in mental health by reviewing

existing studies, with the goal of offering ideas that can help create effective and widely applicable solutions to improve mental health results and lessen social discrimination.

Methods

This systematic review was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines and was registered in the PROSPERO database (CRD42022369853). The aim was to identify effective strategies to reduce the stigma associated with mental disorders.

Eligibility criteria: The inclusion criteria for the review encompassed systematic reviews with or without meta-analyses and clinical trials (CTs) published between January 2019 and December 2023. These studies had to focus on practical interventions for managing the stigma associated with mental disorders, providing statistical measures such as p-values, Odds Ratios (OR), Relative Risk (RR), and/or confidence intervals (CI). The exclusion criteria were other types of studies other than systematic reviews and clinical trials.

Search strategy, selection process, and data collection process: The search for relevant articles was conducted across multiple databases, including PubMed (via MEDLINE), Scielo, and Google Scholar. The primary search terms used were "stigma," "mental disorders," and "intervention." The selection process was carried out by two independent reviewers, with disagreements resolved by a third reviewer.

Data items and effect measures: type of intervention and reduction of stigma (reduction in stigma, measured by specific scales, attitudes, or behaviors).

Study risk of bias assessment and quality of evidence: The risk of bias was assessed using the ROBIS tool (Risk of Bias in Systematic Reviews) and the Cochrane Handbook for Systematic Reviews of Interventions. Additionally, the Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence was used to evaluate the methodological quality of the studies included.

Synthesis methods: Data were registered by population (individuals with mental disorders or those affected by mental health-related stigma), type of intervention (strategies/interventions aimed at reducing stigma), and

outcome (reduction in stigma, measured by specific scales, attitudes, or behaviors).

Results

Figure 1 (PRISMA flow diagram) illustrates the identification, screening, and inclusion process: Records identified: n = 1,021; records screened: n = 44; Studies included: n = 13. Risk of bias analysis is presented in Tables 1 and 2. Characteristics of excluded studies are presented in Table S1. Details about synthesis can be seen in Tables S2, S3, and S4.

The systematic review included 13 studies that examined interventions aimed at reducing the stigma associated with mental disorders, including depression, anxiety, bipolar disorder, and schizophrenia. The interventions were diverse, ranging from psychoeducation programs to biomedical message delivery and contact-based strategies.

Interventions on the stigma of mental disorders

Selected studies are presented in the Table 3.

A systematic review with an evidence level of 3 included articles that evaluated mental health literacy from non-randomized studies. In these studies, no outcome measurement methods were presented, providing little value for this part of the analysis [11].

A systematic review (SR) of small clinical trials (CTs) with interventions for mental health literacy and stigma among Latino adults in the USA showed that photo-novels on depression can increase knowledge and aim to reduce stigma and increase help-seeking intentions for treatment. In this study, participants were randomly recruited to read a photo novel or a text pamphlet, then answered a questionnaire (on reducing the stigma of mental healthcare) before and 1 month after. Better results were reported for the photo-novel intervention, with significantly greater reductions in mental health care stigma. In the post-test, the photo-novel group ($t = 2.01$, $p < 0.05$) and slightly, but not significantly, the text pamphlet group ($t = 1.45$, ns). At the 1-month follow-up, mental health stigma further decreased in the photo-novel group ($t = 3.03$, $p < 0.05$) and regressed toward baseline in the text pamphlet group, resulting in a significant difference between groups at the 1-month follow-up ($t = 2.59$, $p < 0.05$) [12 - 13].

Regarding the evaluation of the effectiveness of a school intervention aimed at improving mental health literacy and reducing stigma, an SR of CTs with an evidence level of 3 recruited 21 studies on mental health

literacy for primary and secondary school students from Western countries and the USA [14]. Studies with interventions involving video or contact with people who had experience with mental disorders reported a reduction in stigma among participants. The results presented after the intervention showed a statistical significance (p=0.03), but there was no difference at the 2.5-month follow-up, suggesting that the effects of the intervention were not sustained post-intervention [14].

Chisholm *et al.* [15], in their research with an evidence level of 2, recruited only CTs and included students aged between 12 and 13 years, who were allocated into two interventions: a) mental health education with contact with a young person with lived experience of mental illness; b) mental health education without contact. Measures were taken three weeks before, two weeks before, and six weeks after the intervention. Of the three topics addressed, only one was about mental illness stigma, and the Reported and Intended Behavior Scale (RIBS) was used to assess stigma-related behavior toward mental illness. Chisholm reported that they found a positive change in stigmatizing attitudes at follow-up but did not present statistical results [15].

Ojio *et al.* [16] presented a study on a CT conducted in Tokyo, Japan, with a total of 179 high school, undergraduate, and graduate students. In the first stage, video lessons were used on the following topics: definition of mental illness and psychological symptoms, and then two groups were allocated to watch 10-minute video lessons. For one group, biomedical messages (BMM) and a film addressing the 'biological mechanisms of mental illnesses,' 'pharmacological mechanisms,' and 'gene-environment interaction.' For the other group, recommended messages (RCM) covered the following topics: a) high prevalence of mental illnesses; b) recovery-oriented messages; and c) messages on social inclusion/human rights [16]. The Mental Illness Understanding Scale (MIDUS) was used in this study. The primary outcome was the effect of BMM on the reduction of useful knowledge about stigma related to mental illness, with an effect from the start until the post-test survey. Both groups showed improvement in MIDUS scores in the post-test survey, with similar effects [F (1.177) =160.5, p<0.0001, n2=0.48]. The effects of the interventions continued until the 1-year follow-up survey (B [95% CI] = -2.56 [-4.27, -0.85], p<0.01) and showed no difference between the groups [16].

A clinical trial conducted at the Guangzhou Psychiatric Hospital in China with senior community mental health professionals (unspecified occupation) participated in a training program that included three modules:

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1st course, 2nd clinical practice, and 3rd combined public health perspective, stigma, and discrimination, adding WHO guidelines, ICD-10, and current policies. Li *et al.* [17] reported that the following scales were used for evaluation: a) Mental Health Knowledge Schedule (MAKS), which assesses mental health knowledge related to stigma; b) Mental Illness: Clinicians' Attitudes Scale (MICA), which assesses stigmatizing attitudes; and c) Reported and Intended Behavior Scale (RIBS), which assesses reported and intended behavior related to mental health. Evaluation occurred before, after, 6 months after, and 12 months after the intervention. Regarding stigma in the pre-assessment, the scales showed no statistical difference between the intervention and control groups. The MAKS scale score increased more in the intervention group at 6 months and 12 months ($p<0.05$), 6 months 24.45 (2.37); 12 months, 24.17 (2.48) 95% CI. On the MICA scale, the intervention group decreased more than the control group (pre-test 49.79 and post-test 47.13), 6 months 44.21 (8.83), 12 months 45.20 (8.95) with 95% CI. After training, at 6 and 12 months, average RIBS scores increased more in the intervention group than the control group ($p<0.001$), posttest [15] 13(2.71), 6 months 16.21 (2.89), 12 months 16.43 (3.28) 95% CI.[17]. For more details, see Table 3.

Interventions to Address the Stigma of Depressive Disorder and Anxiety
Selected studies were inserted in the Table 4.
In a digital intervention aimed at mental health literacy for a specific subgroup, a systematic review (SR) study that included clinical trials (CTs). Its qualitative assessment reported that telehealth for depressive symptoms and stress evaluation had an acceptability rate of 95.2% among participants. The results showed that digital health interventions are effective through current digital technologies, leading to an improvement in young people's mental health. The results did not show a reduction in stigma as a primary outcome. In another CT study recruited for this SR, the result was $p = 0.005$ between pre- and post-test with online cognitive behavioral therapy (CBT); however, the primary outcome was depression reduction [18 – 19].

Mental Health First Aid Program Interventions: a) psychological first aid; b) suicide intervention skills training. These were applied in the public and private sectors to healthcare professionals, first responders, public servants, maintenance staff, government employees, housing association staff, managers, leaders, and the hospitality industry. In countries:

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Canada, Australia, Great Britain, Germany, Sweden, Spain, and Japan [20, 21].

In a CT study recruited for this SR, an online psychoeducation program focused on depression and anxiety was evaluated, presented in a simple multimedia format containing graphics, videos from consumers with lived experiences of depression and anxiety, and exercises [20 – 21].

The statistical results revealed that for the intervention group compared to the control group participants, there was a decline in depression and anxiety stigma scores. Customized contrasts revealed a decline in depression and anxiety stigma scores for MH-Guru compared to control group participants from baseline to post-test and from baseline to 6-month follow-up (post-test: depression $t = 6.4$, $p<0.001$; anxiety= 5.5, $p < 0.001$). 6 months: Depression ($t = 2.8$, $p = 0.005$); Anxiety ($t = 4.1$, $p < 0.001$). There were moderate effect sizes between the groups for depression and anxiety stigma at post-test ($d = -0.56$ and $d = -0.42$, respectively) and at 6 months ($d = -0.47$ and $d = -0.42$, respectively), where the negative effect corresponded to a reduction in stigma for the MH-Guru group [20 – 21].

Arthur *et al.* [22] report the effectiveness of a mental health literacy program for community leaders in southern Ghana. A CT study with a total of 128 participants was divided into groups where the first part presented a) videos on myths and beliefs in mental disorders; b) real-life experiences of a person with depression and schizophrenia; c) a PowerPoint presentation of signs, symptoms, and treatment for depression and schizophrenia; and d) exploration of participants' prior knowledge about depression.

In the second part: problem solving and exercises, a depression vignette was presented where participants had to describe the image and what was happening behind it, functioning as a story. The control group received a basic leaflet on mental health issues written in simple language. A stigma questionnaire was administered (personal stigma and perceived stigma) [22]. For personal stigma, the mean difference in personal stigma scores between groups at follow-up was 1.18 (95% CI: 3.51 to 1.14), and the size of the differences in mean scores was small (Cohen's d = 0.15, 95% CI: 0.22 to 0.53).

For perceived stigma, the mean difference in change in perceived stigma scores between the groups was 3.10 (95% CI: 5.63 to 0.57), and the

magnitude of the difference in mean scores was (Cohen's d = 0.51, 95% CI: 0.13 to 0.89) [22]. Table 4.

Interventions on the stigma of bipolar disorder and schizophrenia
Selected studies are presented in the Table 5.
Heim *et al.* [23], regarding contact interventions, the results were mixed. In one of the studies reviewed, a contact intervention was examined where a young person with schizophrenia was presented, along with a video featuring different individuals with schizophrenia. Despite reporting a statistically significant change in the pre-intervention and 1- month follow-up, the same results were not observed [23].

In another recruited CT, a face-to-face contact intervention was compared with a video-based contact intervention for mental health literacy among medical students [23]. Both groups received an educational lecture before the contact intervention. A significant time effect emerged on the total score of the Opening Minds Stigma Scale for Health Care Providers ($p < 0.001$, partial $\eta^2 = 0.49$), but there was no statistically significant difference between the two conditions (video versus face-to-face) [23].

A CT was recruited for an RS study aiming to examine general practitioners' views and attitudes toward schizophrenia and the changes in their attitudes after anti-stigma education. A sample of 54 general practitioners began the session with interactive training and a slide presentation on the course, treatment, impact of stigma, and the role of the general practitioner [23, 24]. Another session followed with case discussions. A 16-item questionnaire focusing on doctors' opinions and attitudes toward schizophrenia was completed by participants before and after the intervention. Regarding the course of schizophrenia, 83% of general practitioners responded that patients with schizophrenia would recover their functionality. This number rose to 92.5% after the training sessions. Responses concerning a negative course decreased from 13.2% before the training to 7.5% ($p = 0.2$) during follow-up [23 – 24].

Kaur *et al.* [25] highlighted a level 1 evidence study, an RS of studies with data collection, involving all types of stigma-related interventions in the mental health domain. Nine studies were included in this RS from regions of India, with participants being a) community members, b) healthcare workers, c) patients with schizophrenia and caregivers, d) women living with HIV/AIDS, and e) mental health professionals.

The interventions were a) case demonstration lecture, b) role play, c) mental health education workshops, and d) patient transport programs to specialized care [25].

There was no reduction in stigma as a primary outcome, but the results showed [25]:

- Improved attitude among healthcare workers.
- Improved knowledge and attitude toward depression.

Fujii *et al.* [26] reported on a CT with N = 115 that developed a scale for evaluating stigma in schizophrenia among community pharmacists in Aichi Province, Japan. The intervention group, consisting of 56 participants, underwent an educational program, attending a 60-minute lecture by a psychiatrist covering topics such as the concept, epidemiology, symptoms, the impact of the disease on social activities, diagnosis, and treatment. Another group of 59 participants engaged in the following activities: a) team presentation; b) lecture on mental disorder-related stigma; c) management of patients with schizophrenia; d) discussion to clarify patients' experiences; e) interview with a patient; f) discussion on the pharmacists' learning from patient experiences.

The evaluation used a stigma scale for schizophrenia among community pharmacists (SSCP), administered before the lecture (t1), after the lecture (t2), and after communication with diagnosed patients (t3). The effects of the contact-based educational program on reducing stigma were Factor I: Social distancing in professional pharmacy services and Factor II: Attitudes toward patients with a diagnosis of schizophrenia [26].

The total SSCP score was 9.0 (16.0 – 5.0) in the contact-based intervention group and 3.0 (7.0 – 1.0) in the educational lecture group (improvement rates of 15.5% and 5.2%, respectively; $p < 0.001$) [26]. The improvement rates for each factor in the contact-based intervention and educational lecture groups were Factor I: 18.3% and 7.1%; Factor II: 23.0% and 4.5%; Factor III: 5.0% and 6.7%; Factor IV: 1.0% and 0%, respectively, revealing significant improvements in the scores for Factors I and II ($p = 0.001$ and $p < 0.001$, respectively) [26]. Table 5.

Discussion

The present work, containing a critical analysis of systematic reviews and clinical trials, aimed to synthesize the main interventions for managing the stigma of mental disorders.

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Practical interventions for managing stigma are, from a public health perspective, important strategies to reduce the social and economic burden of mental disorders [26]. Stigma is a barrier to help-seeking that contributes to the gap in mental health treatment, making effective strategies to reduce stigma vital [25].

Most of the studies combined education strategies with practical activities in addition to practical problem-solving activities [22]. Educational interventions on mental health literacy are effective in improving individuals' attitudes toward people with mental illness, which, in turn, may lead to better outcomes for these individuals [22].

Other strategies observed were videos, presentations, problem-solving, professional training, demonstration lectures, role-play, mental health education workshops, and a patient transport program to specialized care [20, 22, 25, 27, 28].

Despite its limitations, this systematic review indicates that combined interventions can be effective in reducing stigma related to mental disorders. When analyzing methodological quality, level of evidence, and bias risk of the articles recruited for analysis, it was possible to find interventions with satisfactory results for training, literacy, and mental health education. To be effective, the intervention needs to be tailored to the targeted group (health professionals, community leaders, students, and families of people with mental disorders).

Moreover, the findings indicate that stigma is not restricted to a particular group of individuals; it exists even among those who work with people with mental disorders. The combination of training with theoretical and practical models showed positive results in all studies presented, regardless of the level of evidence and risk of bias.

Data showed results in long-term follow-up, with assessment periods ranging from the post-test to six months after the intervention. The importance of constant assessment and combining strategies over time to increase statistical robustness and effectively recognize the intervention's impact is clear. Given the results, it becomes evident that there must be a constant implementation of interventions aimed at reducing stigma, ensuring they are effective and replicable in various intervention groups.

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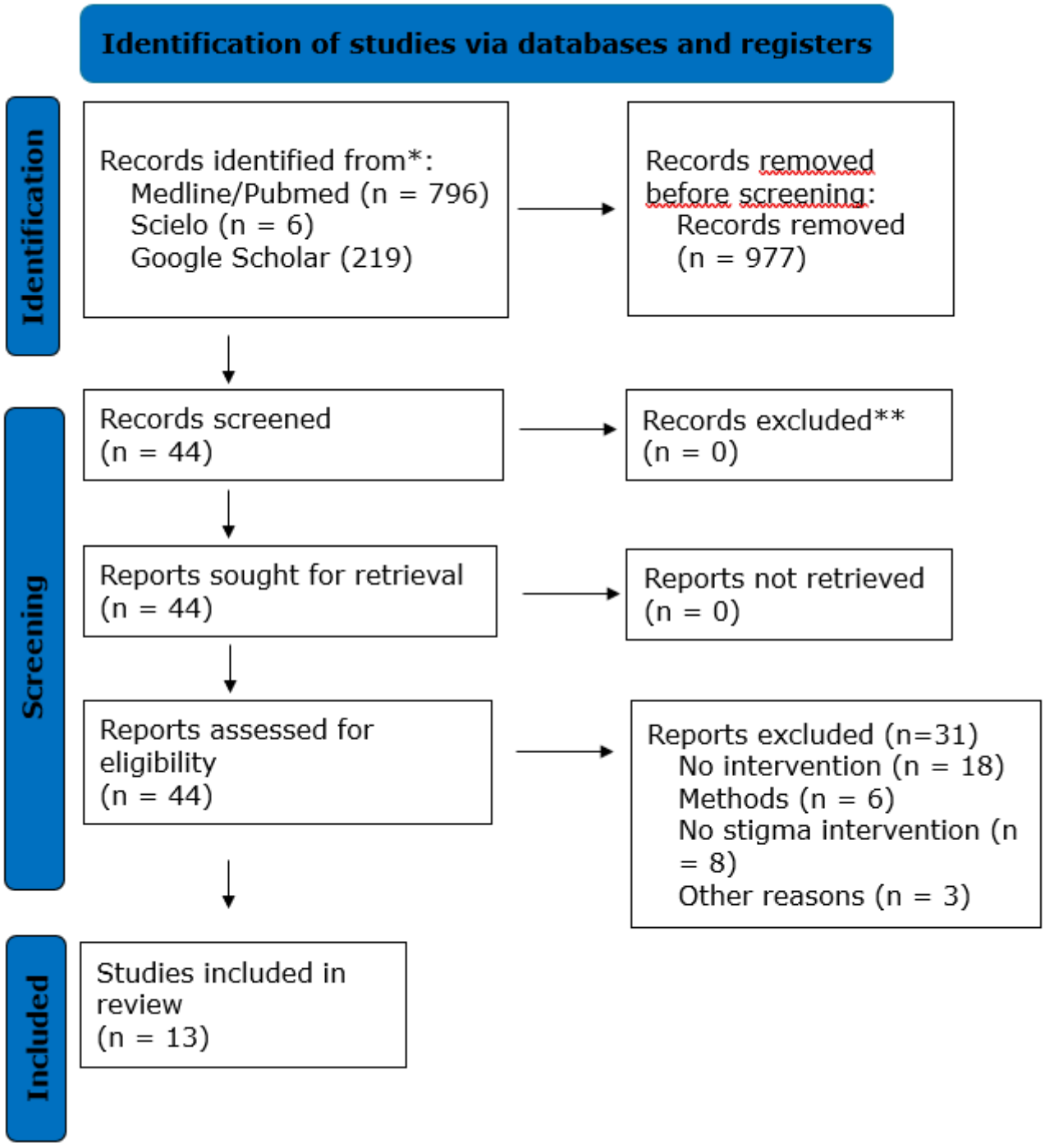

Figure 1. Flow chart

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Table 1. Risk of bias for systematic reviews.

Study	Study eligibility criteria	Identification and selection of studies	Data collection and study evaluation	Synthesis and findings	Risk of bias in the review
Munawar *et al.* 2020	Low	Low	Low	Low	Low
Liu, Y *et al*. 2023	Low	Low	Low	Uncertain	Uncertain
Pérez-Flores, N, J. et al. 2021	Uncertain	Uncertain	Low	Uncertain	Uncertain
Toth, M, D. et. al. 2022	Uncertain/low/low	Low	Low	Low	Low
Heim *et al.* 2020	Low	Low/uncertain/uncertain	Low	Low	Uncertain
Heim *et al.* 2020	Low	Low/uncertain/uncertain	Low	Low	Uncertain
Yan Ma, Anderson and Queimadura 2023	Low	Low	Low	Low	Low
Kaura *et al.* 2021	Low	Low	Uncertain	Uncertain	Uncertain

Table 2. Risk of Bias for Clinical Trials.

Study	Random Sequence Generation	Allocation Concealment	Blinding of Participants and Personnel	Blinding of Outcome Assessors	Incomplete Outcome Data	Selective Reporting	Other Sources of Bias	Overall
Chisholm *et al.* 2012	Low	Low	Low	Low	Low	Low	Low	Low
Yam *et al.* 2020	Low	Low	Low	Low	Low	Low	Low	Low
Ojio *et al.* 2020	Uncertain/Low/Uncertain	Low	Low	Low	Low	Low	Low	Low
Fujii *et al.* 2021	Low	Low	Low	Low	Low	Low	Low	Low
Li *et al.* 2015	Low	Low	Low	Low	Low	Low	Low	Low

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Table 3. Interventions to reduce stigma related to mental disorders.

Reference Type of study	Intervention Description	Analysis
Munawar *et al*., 2020 / SR	Mental health literacy: - Stigma. - Approach of seeking help for the treatment of mental disorders. knowledge of mental health.	- Level 3 evidence. - No intervention with statistical value.
Pérez-Flores; Cabassa, 2021 / SR	Mental health literacy: - Photo novels to increase knowledge about depression and reduce stigma.	- Level 2 evidence. - Effective in post-test ($t=2.01$, $p<0.05$) after one month ($t=3.03$, $p<0.05$).
Yan Ma *et al*., 2023 / SR	Mental health literacy: - Videos or contact with people who had experienced mental disorders.	- Level 3 evidence. - Reduction in stigma in post-test ($p=0.03$), sustained at 2.5 months.
Chisholm *et al*., 2012 / CT	Mental health literacy: - Mental health education, with contact with a young person with lived experience of mental illness.	- Level 2 evidence. - No statistical value.
Ojio *et al*., 2020 / CT	Video lesson (10 minutes) with biomedical content on the biological mechanism of mental disorders, pharmacology, and gene-environment interaction.	- Level 2 evidence. - Significant effect in post-test ($F(1, 177) = 160.5$, $p<0.0001$, $n2=0.48$), continuing in the one-year follow-up study (B [95% CI] = -2.56 [-4.27, -0.85], $p<0.01$).
Li *et al*., 2015 / CT	1st course; 2nd clinical practice; 3rd public health perspective, stigma, and discrimination, incorporating WHO guidelines, ICD-10, and current policies.	- Level 3 evidence. - The MICA scale GI decreased more than the CG. ($P < 0.001$). Pre-test 49.79(8.29), post-test 47.13 (7.50), 6 months 44.21(8.83), 12 months 45.20(8.95). 95% CI.

Table 4. Interventions to reduce stigma related to depressive and anxiety disorders.

Reference Type of study	Intervention Description	Analysis
Liu *et al*., 2023 / SR	Digital intervention for mental health literacy - Online CBT intervention, 8 sessions.	Digital intervention for mental health literacy - Online CBT intervention, 8 sessions.
Tóth *et al*., 2022 / SR	Online psychoeducation focused on depression and anxiety, delivered in a simple multimedia format. 2 modules: the 1st with graphics and videos from consumers sharing their lived experiences with depression and anxiety; the 2nd with exercises.	Online psychoeducation focused on depression and anxiety, delivered in a simple multimedia format. 2 modules: the 1st with graphics and videos from consumers sharing their lived experiences with depression and anxiety; the 2nd with exercises.
Arthur *et al*., 2020 / CT	1st part: Videos about myths and beliefs in mental disorders; real-life experience of a person with depression and schizophrenia; PowerPoint presentation on signs, symptoms, and treatment for depression and schizophrenia; exploration of participants' prior knowledge about depression. 2nd part: Problem-solving and exercises (a vignette of depression was presented, where participants had to describe the image and what was happening behind it, functioning like a story).	1st part: Videos about myths and beliefs in mental disorders; real-life experience of a person with depression and schizophrenia; PowerPoint presentation on signs, symptoms, and treatment for depression and schizophrenia; exploration of participants' prior knowledge about depression. 2nd part: Problem-solving and exercises (a vignette of depression was presented, where participants had to describe the image and what was happening behind it, functioning like a story).

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Table 5. Interventions to reduce stigma related to schizophrenia and bipolar disorder.

Reference Type of study	Intervention Description	Analysis
Heim *et al.*, 2019 / SR	Contact intervention: A 2-hour lecture addressing mental health and psychiatry (Causes of stigma associated with schizophrenia; common myths about schizophrenia and the relationship between violence, aggression, and independence); - A young person with schizophrenia then shared and discussed their experiences with the students.	Contact intervention: A 2-hour lecture addressing mental health and psychiatry (Causes of stigma associated with schizophrenia; common myths about schizophrenia and the relationship between violence, aggression, and independence); - A young person with schizophrenia then shared and discussed their experiences with the students.
Heim *et al.*, 2018 / SR	Classroom session on the impact of stigma in schizophrenia; - Clinical case session.	Classroom session on the impact of stigma in schizophrenia; - Clinical case session.
Kaur *et al.*, 2021 / SR	Case demonstration lectures, dramatization, mental health education workshops, and a patient transport program to specialized care.	Case demonstration lectures, dramatization, mental health education workshops, and a patient transport program to specialized care.
Fujii *et al.*, 2021 / CT	- Educational lecture with a psychiatrist on schizophrenia; - Activities: team presentation; lecture on mental disorders related to stigma; patient management with schizophrenia; discussion to clarify patient experiences; patient interviews; discussion of pharmacist learning from patient experiences.	- Educational lecture with a psychiatrist on schizophrenia; - Activities: team presentation; lecture on mental disorders related to stigma; patient management with schizophrenia; discussion to clarify patient experiences; patient interviews; discussion of pharmacist learning from patient experiences.

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Table S1. Characteristics of excluded studies.

N	Study	Reasons for Exclusion
1	Sacco; Camilleri; Eberhardt; Umla-Runge, and Newbury-Birch, 2022	No intervention (addresses practical interventions for managing the stigma of mental disorders)
2	Gurung; Poudyal, and Wang, 2022	No intervention (addresses practical interventions for managing the stigma of mental disorders)
3	Cosh; Mcneil, and Jeffreys, 2023	No intervention (addresses practical interventions for managing the stigma of mental disorders)
4	Görzig; Ryan, 2022	No intervention (addresses practical interventions for managing the stigma of mental disorders)
5	McLaren, Peter, 2021	No approach to stigma
6	Ayuso, 2023	No approach to stigma
7	Le; Eschliman; Grivel, 2022	No intervention (addresses practical interventions for managing the stigma of mental disorders)
8	Petersen & Lund, 2011	No intervention (addresses practical interventions for managing the stigma of mental disorders)
9	Johnson; Sanghvi, and Mehrotra, 2022	Methodological rigor
10	Tay; Klainin, 2018	Methodological rigor
11	Beattie; Smilenova, and Krishnaratne, 2020	No intervention (addresses practical interventions for managing the stigma of mental disorders)
12	Cossu; Cantone, and Pintus, 2015	No intervention (addresses practical interventions for managing the stigma of mental disorders) and low methodological rigor
13	Lievens; Vacaru, and Kruithof, 2021	No approach to stigma and mental disorder
14	Holzinger; Dietrich, and Heitmann, 2008	Methodological rigor
15	Campos; Dias; Duarte, and Veiga, 2018	Methodological rigor
16	Jimenez & Reynolds, 2015	Methodological rigor
17	Van Kerkhof, 2010	No approach to stigma

N	Study	Reasons for Exclusion
18	Jensen & Morthorst, 2015	No primary intervention (addresses practical interventions for managing the stigma of mental disorders)
19	Munson; Cole, and Stanhope, 2016	No direct intervention for stigma
20	Wang: Hedley, and Bury, 2020	No direct intervention for stigma
21	Hall; Morey, and Beckham, 2020	No direct intervention for stigma
22	Yan Ma, Anderson, Queimadura, 2023	No primary intervention (addresses practical interventions for managing the stigma of mental disorders)
23	Hartman *et al.*, 2023	No approach to stigma
24	Gureje *et al.* 2017	No intervention for stigma
25	Srinivasan *et al.* 2018	No intervention for stigma
26	Borràs *et al.* 2009	No intervention for stigma
27	Hanlon *et al.* 2016	No direct intervention for stigma
28	Ito-Jaeger, S., *et al.* 2022	Methodological rigor
29	Cossu, G., *et al.* 2015	No intervention (addresses practical interventions for managing the stigma of mental disorders)
30	Hanlon *et al.* 2016	No intervention (addresses practical interventions for managing the stigma of mental disorders)
31	Barbosa *et al.* 2023	No intervention (addresses practical interventions for managing the stigma of mental disorders)

Table S2. Interventions to reduce stigma related to mental disorders.

Author, Year	Population (Number and Setting)	Assessment / Intervention	Study Type	Comparator / Measures	Outcomes	Main Statistical Findings
Chisholm *et al.*, 2012	Students aged 12–13	Two conditions: - Contact with a young person with lived experience of mental illness and education. - Mental health education without contact.	CT, pre-and post-intervention	- Reported and intended behavior scale (RIBS) - Mental health knowledge scale (MAKS) - Wagnild & Young resilience scale - Brief schizotypal personality questionnaire (SPQ)	- Reduced stigma related to mental illness - Mental health literacy - Mental health promotion	**Level 2 evidence** Contact intervention showed positive change in stigmatizing attitudes immediately and at 6-month follow-up (no statistical value reported).
Munawar *et al.*, 2020	Mixed method: qualitative/CT/quasi-experimental / cross-sectional Total: 59	No detailed sample size. Focused on: - Stigma - Help-seeking behavior - Mental health knowledge	Systematic Review	Medical and non-medical populations Autistic and non-autistic individuals Standardized instruments not referenced for	- Reduced stigma - Less discriminatory attitudes - Improved referrals - Increased empathy	**Level 3 evidence** No evaluation of intervention studies. No % values. Lack of psychometric tools made it difficult to assess mental health knowledge.

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Author, Year	Population (Number and Setting)	Assessment / Intervention	Study Type	Comparator / Measures	Outcomes	Main Statistical Findings
				validity or reliability		
Pérez-Flores *et al*., 2021	Total: 7 studies Sample sizes from 41 to 4,122 Mean sample: 142	Mental health interventions: - Individual sessions - Printed materials - Group sessions	Systematic Review	Latino adults in the U.S. Latino scale for stigma toward antidepressants	- Greater knowledge about depression with brochures - Improvement with photonovela - Psychoeducation increased psychosis knowledge	**Level 2 evidence** Statistically significant stigma reduction with photonovels vs. brochures. No % reported. The psychoeducation program showed lower knowledge among community members vs. caregivers.
Unger *et al*., 2013	Latino Americans from community schools in Los Angeles N = 57	Efficacy of a photonovel to: - Increase depression knowledge - Reduce stigma	Randomized controlled longitudinal trial	Hispanic participants - Photonovela reading - Text-based leaflet	Questionnaire: Concerns about mental health care stigma	- Increased depression knowledge - Reduced stigma toward mental health care **Post-test (t=2.01, p<0.05)** **After 1 month: t=3.03, p<0.05**

Author, Year	Population (Number and Setting)	Assessment / Intervention	Study Type	Comparator / Measures	Outcomes	Main Statistical Findings
Yan Ma, Anderson, Queimadura, 2023	21 studies 15 on literacy and stigma Countries: Europe, Canada, Australia, USA Populations: Elementary and high school students Sample size: N=27,122	Mental health literacy interventions, including in-person or video contact with people who had mental illness	Systematic Review	Pre- and post-intervention Attribution questionnaire (Corrigan, Markowitz, Watson, Rowan, Kubiak)	- Interventions with live contact significantly reduced stigma (p=0.03); no effect at 2.5-month follow-up - Statistically improved stigmatizing attitudes and beliefs (p < 0.0001 to 0.034) - Reduced stigma toward mental illness (p=0.014), not toward severe mental illness (p=0.892)	**Level 1 evidence** Improvement in mental health stigma, attitudes, and beliefs.

Table S3. Interventions to reduce the stigma related to depression and anxiety disorders.

Author, Year	Population (Number and Configuration)	Assessment / Intervention	Study Type	Comparator	Forms of Measurement	Outcome / Main Findings
LIU *et al*., 2023	15 studies; 78 participants (LGBTQ+ youth)	Digital mental health interventions: telehealth, web/mobile apps, serious games, social networks, and online groups	Systematic review (CT/qualitative/quantitative)	—	Qualitative impressions: quantitative results not statistically presented	**Level 1 evidence**: Structured and formal intervention showed reduced depressive symptoms compared to waitlist control. No statistical value found.
Craig *et al*., 2021b	78 participants	8-session online CBT	CT	Waitlist control	Beck-II, COPE, adolescent stress measure, Hope Scale	**Depression:** b = -5.30, p = 0.005, d = 0.60 **Stress:** b = 0.51, p = 0.005 **Coping resources:** b = 0.27, p = 0.059
TÓTH *et al*., 2022	22 studies (9 RCTs, 13 quasi-experimental); employees, managers, and business owners	Interventions: Mental Health First Aid, Psychological First Aid, Suicide Prevention Skills Training delivered online, in person, or mixed	Systematic review	With and without intervention	Personal/perceived depression stigma scale, mental health knowledge, open-mindedness scale, knowledge/efficacy scales, discrimination/devaluation scales	**Level 3 evidence**: 1-hour online training for government employees (n=507): reduced stigma. 12-hour in-person training (n=199): reduced personal stigma lasting 2 years. Mixed format to health workers (n=192): long-lasting stigma reduction.

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Author, Year	Population (Number and Configuration)	Assessment / Intervention	Study Type	Comparator	Forms of Measurement	Outcome / Main Findings
Griffiths *et al.*, 2016	507 government employees (Australia)	MH-Guru online psychoeducational induction (2 × 30-minute modules)	CT	Waitlist control	DSS-Personal; GASS-Personal	**Post-test**: - Depression: t (421) = 6.4, p < 0.001 - Anxiety: t (416.6) = 5.5, p < 0.001 **6-month follow-up**: - Depression: t (339.8) = 2.8, p < 0.005 - Anxiety: t (326.3) = 4.1, p < 0.001 **Level 2 evidence**: Significant reductions in stigma.
Arthur *et al.*, 2020	128 community leaders (Southern Ghana)	Mental health literacy with problem-solving approach using videos and real-life narratives (depression, schizophrenia), PowerPoint, exercises	CT (Pre-post)	—	Stigma questionnaire (personal and perceived stigma)	**Level 2 evidence**: Public stigma perceived as high. Personal stigma: 1.18 (95% CI: 3.51–1.14) Perceived stigma: 3.10 (95% CI: 5.63–0.57)

Table S4. Interventions to reduce stigma related to schizophrenia and bipolar disorder.

Author, Year	Population (Number and Configuration)	Assessment / Intervention	Study Type	Comparator	Forms of Measurement	Outcome / Main Findings
Fujii *et al*., 2021	115 community pharmacists, Aichi—Japan	Lecture by psychiatrist (n=56) vs. contact-based group interacting with patients with schizophrenia (n=59)	CT (pre-post)	SSCP (Stigma Scale for Community Pharmacists)	The contact group improved significantly more than lecture group	**Level 2 evidence** Total improvement: 15.5% (contact) vs. 5.2% (lecture), $p<0.001$ Factor I: 18.3% vs 7.1% ($p=0.001$) Factor II: 23.0% vs 4.5% ($p < 0.001$) Effective for evaluating and reducing pharmacist stigma toward schizophrenia
Heim *et al*., 2018	18 studies; nursing and medical students from low- and middle-income countries; N = 44–205	Anti-stigma interventions (lectures, videos, patient interviews, practical placements)	Systematic review	Control vs intervention group Stigma and attitude scales (including WPA and custom tools)	Improved professional performance in dealing with people with mental illness	**Level 2 evidence** Significant change with brief intervention ($p<0.001$). Favorable attitudes from clinical placements in specialized services ($p=0.04$). No significant difference between live and video contact interventions (both improved stigma, $p<0.001$).
Kaura *et al*., 2021	Nine studies; India Populations: community	Lectures, dramatizations, case demos, workshops,	Systematic review (pre-post)	Interventions not clearly described	Better attitudes and knowledge	**Level 1 evidence** Improved attitudes; no p-values reported. Health workers (n=63) showed

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	members, health workers, patients with schizophrenia, caregivers, women with HIV/AIDS, mental health professionals	patient transport programs			about mental disorders	belief change after 4-day training. The intervention group (n=333) had better depression knowledge and lower stigma than the control group.
Li *et al*., 2014	99 mental health professionals, Guangzhou, China	Training on mental disorders, stigma, and personal testimony from instructor	CT (pre-post)	Author's questionnaire, RIBS, MICA	Improved diagnosis recognition and reduced stigma	**Level 2 evidence** Stigma attitude (MICA): t=6.64, $p<0.001$, $d=0.48$ Behavioral discrimination (RIBS): t=-5.44, $p<0.001$, $d=0.34$
Uko *et al*., 2006	106 general practitioners, Turkey	Educational anti-stigma session on schizophrenia and case-based discussion	CT (pre-post)	Author's questionnaire	Reduced belief in negative course of schizophrenia (from 13.2% to 7.5%)	**Level 3 evidence** Educational sessions may help change attitudes when combined with practical approaches: not statistically significant (p=0.2)

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