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Reducing human immunodeficiency virus stigma: a scoping review of intervention strategies

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ABSTRACT

Stigma has become one of the aspects closely associated with human immunodeficiency virus (HIV) and (acquired immunodeficiency syndrome (AIDS), causing adverse effects for those affected. The primary goal of this scoping review is to identify various intervention models aimed at reducing HIV-related stigma. This review follows the PRISMA 2015 guidelines and utilizes sources from three online journal databases: PubMed, ScienceDirect, and Scopus. Search criteria include articles published in the last five years, from 2018 to 2023. Out of the initially retrieved 1,084 articles, 9 articles meeting inclusion criteria were selected for a more in-depth review. Most interventions typically employ a mix of strategies, incorporating diverse degrees of social-ecological involvement. Interventions employing dual strategies and extended durations with multiple sessions have the potential to more effectively reduce stigma. Supporting HIV-safe spaces and encouraging community involvement to understand the link between HIV stigma and the spread of HIV/AIDS in their surroundings can effectively reduce HIV stigma. Overall, most studies included in this review indicate fairly satisfactory outcomes. However, when implementing interventions, it remains crucial to tailor them to the specific location, considering that stigma is a social construct. The development of instruments to measure intervention effectiveness needs to be pursued to comprehensively identify significant intervention impacts.

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1. INTRODUCTION

The issues surrounding the human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) pose a significant obstacle to achieving the sustainable development goals (SDGs) by 2030 [1]–[3]. For several years, HIV and AIDS have been a primary focus of health programs because they not only impact physical health but also affect the mental well-being of those affected. In terms of physical health, HIV transmission induces a decline in the immune system, heightening vulnerability to opportunistic infections and various diseases and complications [4], [5]. The progressive nature of the disease can lead to disruptions in organ function and significantly detrimentally impact the quality of life for individuals, notably through opportunistic infections [6]. A study also elucidates menstrual dysfunction in women with HIV due to the necessity of antiretroviral (ARV) consumption [5], [7]. Beyond the direct impacts on physical health, psychosocial aspects emerge as crucial considerations [8], [9]. The persisting stigma and discrimination against individuals living with HIV/AIDS can trigger social isolation and serious psychological consequences [9].

Stigma is closely associated with HIV and AIDS, causing adverse effects for both sufferers and their surrounding environments [3], [10]. According to the Joint United Nations Programme on HIV and AIDS (UNAIDS), HIV stigma is described as a phenomenon where individuals living with HIV and AIDS, or associated with it, are perceived as inferior [11]. According to the human rights fact sheet 2021, more than 50% of individuals aged 15-49 hold discriminatory attitudes towards people living with HIV and AIDS (PLWHA) [12]. According to the Stigma Index analysis, in 7 out of 11 countries where data is available, more than half of the instances of job loss are associated with discrimination linked to HIV [13].

The numerous efforts made to mitigate the impact of stigma on PLWHA have not yielded significant results, as evidenced by the high prevalence of ongoing stigma incidents [14]. Stigma continues to persist and remains a significant barrier to HIV control [15]. Stigma can lead to various health impacts through three different mechanisms: anticipated stigma, internalized stigma, and enacted stigma. Anticipated stigma interprets how someone may expect individuals with HIV and AIDS to be treated unfairly and is estimated to be one of the most impactful stigmas affecting PLWHA's adherence to antiretroviral therapy (ART) and other treatments [16]. In certain occupational environments, individuals may harbor concerns about the potential impact of disclosing their HIV status on their career trajectory. They may fear potential repercussions such as termination, ostracization, or workplace discrimination. Internalized stigma with HIV/AIDS can lead to feelings of being undervalued or having less worth than others, causing mental health issues [17]. Institutionalized HIV stigma reflects society's negative views on those with HIV, contributing to lower adherence to ARV treatment. As for enacted stigma, it manifests in the ostracism and intolerant treatment by others [18]. Examples include discrimination among health workers such as restricting individuals with HIV/AIDS from accessing specific health services, stereotypes, and negative prejudices from others due to suffering from HIV.

HIV stigma can have negative impacts on PLWHA as well as the surrounding community. Many PLWHA conceal their HIV status and refrain from undergoing ART due to the fear of experiencing unequal treatment from their environment [19]. This reluctance is the beginning of an increase in HIV-related deaths. Additionally, HIV stigma can affect the broader community through the fear of virus transmission, originating from misconceptions about HIV itself [20]. This fear leads communities to involuntarily sever ties with PLWHA without accurate information about HIV and AIDS. Stigma further isolates PLWHA, and the general public lives in increasing fear. Numerous HIV stigma reduction programs have been identified, targeting different populations and utilizing various approaches [21]. UNAIDS argues that knowledge alone does not automatically lead to a reduction in stigma [22]. Based on the framework proposed by Earnshaw [16], the HIV stigma framework posits that mechanisms of stigma against PLWHA manifest in three main ways: stereotypes (cognitive), prejudice (affective), and discrimination (behavioral) against PLWHA. Therefore, in addition to increasing knowledge about HIV, stigma reduction programs should also aim to improve multidimensional attitudes toward PLWHA [23], [24]. The goal of this scoping review is to examine and map the forms of HIV stigma reduction interventions that have targeted one or more levels of social ecology in reducing stigma, promoting supportive environments, positive behaviors, and positive impacts on individuals exposed to HIV. Additionally, this scoping review can provide insights for healthcare professionals in designing HIV stigma reduction interventions and directions for further research.

2. METHOD

The scoping review method is employed for mapping the current state of interventions in reducing HIV stigma. This method can identify current approaches and uncover gaps in the literature. The research method follows the stages of scoping review as outlined by Arksey and O'Malley in Peters *et.al* [25], [26] and is supplemented by the preferred reporting items for systematic reviews and meta-analyses (PRISMA) [27]. The PRISMA diagram flow is shown in Figure 1.

2.1. Identifying relevant studies

This research focuses on identifying interventions to reduce stigma at various levels and across different countries. Thus, the research question for this scoping review is, "Which interventions can effectively reduce HIV stigma?". Mapping current research on intervention strategies to reduce HIV stigma can identify existing gaps and serve as a reference for shaping future stigma reduction strategies.

A systematic search was conducted on three electronic databases for instance PubMed, Scopus, and ScienceDirect, to identify potentially relevant analyses. The search used MeSH terms such as "Intervention" or "Strategy," "Stigma" or "Social Stigma," "Reduce" or "Reduction," "HIV," as well as non-MeSH terms outside PubMed. This search was conducted on September 15, 2023. Reference lists were also analyzed to identify potentially relevant articles not included in the initial search. The selected articles are research papers found in the database search.

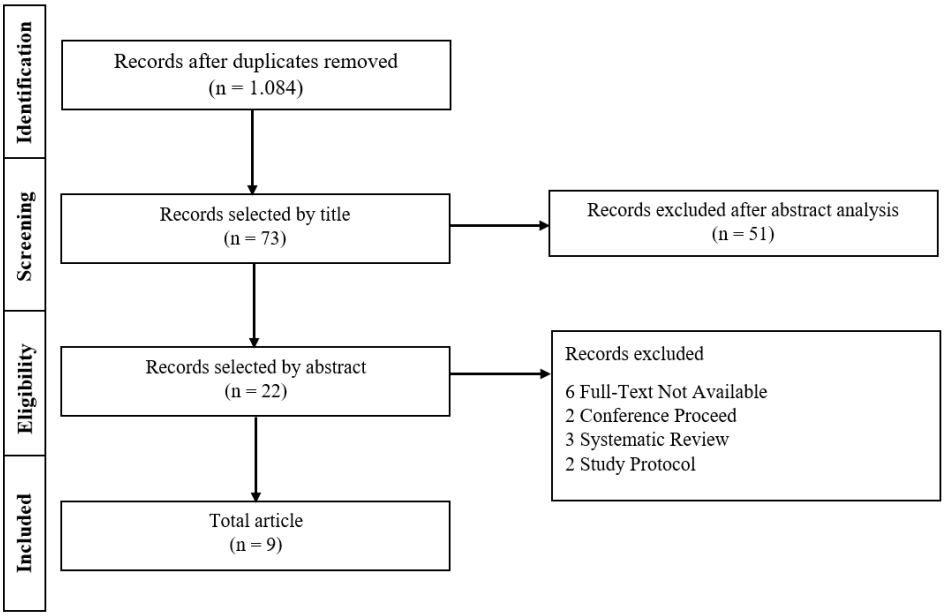

Figure 1. The flow diagram on identifying HIV AIDS-related stigma reduction intervention the literature

2.2. Study selection

After conducting the search and eliminating duplicate articles, a three-stage review process was undertaken. In the first stage, a review of titles and abstracts was conducted to identify and exclude irrelevant material based on predefined criteria. After reviewing the abstracts, a full-text review was performed to ensure that the articles truly met the established criteria. Articles were included in this scoping review if they met the following two criteria: First, the research must report on how interventions reduce incidents of HIV stigma. An article was considered to report on interventions to reduce HIV stigma if the study described activities aimed at changing the knowledge, attitudes, and/or behaviors of a specific population or addressed social factors influencing HIV stigma incidents. Second, articles were published within the last five years, specifically between 2018 and 2023. Articles published in languages other than English and those without full-text availability were excluded. Additionally, non-original articles or proceedings from seminars were also excluded.

For all selected studies at the abstract stage, data were extracted using an instrument designed for this research, including characteristics (type, location, and level of intervention), methodology (study design, study population, framework), and outcomes (effectiveness of interventions in reducing HIV stigma). Out of a total of 1,084 articles identified through database searches, 73 studies were selected as potentially relevant for this analysis based on the article titles. From these 73 articles, 22 were selected based on abstracts. Subsequently, 12 other studies were excluded based on exclusion criteria. Finally, 11 studies on interventions to reduce HIV stigma were identified, accessible, and published in English.

3. RESULTS AND DISCUSSION

3.1. Study characteristic

In this review, a total of 9 articles have been included, with each article serving as a sample and outlining various interventions aimed at reducing HIV stigma. Table 1 provides an overview of the related interventions, including details about the geographical regions where they were implemented, target groups, and the frameworks used. The most frequently targeted group is healthcare workers, primarily due to their high level of direct interaction with people living with HIV (PLHIV), increasing the risk of stigma and discrimination. Information-based interventions emerge as the most commonly used intervention method. Table 2 provides a representation of sample intervention activities categorized at various levels within the social context.

Overall, only two articles focus on the intrapersonal level of intervention, involving comprehensive care for PLHIV both physically and mentally. The other seven studies describe interventions aimed at changing factors outside the individual to create an environment that supports sustained changes in individual behavior, knowledge, and attitudes. Essentially, these articles integrate interventions from various levels, but

the categorization above is determined based on the initial objectives of the respective studies. These studies were conducted in five different regions, with three studies from the Americas, two from Africa, two from South Asia, one from Europe, and one from Australia. Out of all these studies, six were conducted in low- to middle-income countries according to the World Bank's definition [28].

Table 1. Description of articles included in review

Authors	Study origin	Intervention approach	Intervention target	Framework	Level
[29]	USA	Providing comprehensive patient-oriented	PLWH diagnosed with mental health/substance use disorders homeless	Patient-centered medical home framework	Intrapersonal, community
[30]	New York, USA	CHANGE: Comprising community organization workshops, five pop-up events & campaign	General Public	stigma and critical race theories	Community
[31]	India	The DriSti (DRIve against STIgma) Interactive intervention for healthcare providers	Nursing Student	Social cognitive theory	Organizational
[32]	South Africa	Training healthcare workers as change agents in and supported by a social marketing campaign	HCWs	theory of Diffusion of Innovations	Organizational
[33]	Maharashtra, India	Integrated Counselling and Testing Centre	Patient, HCWs	-	Intrapersonal organizational
	North Carolina, USA	HealthMpowerment: online forum conversation based	18-30 years man	Giddens's structuration theory	Interpersonal
[34]	South Africa	Educational Approach (U=U) Educational message delivery, public campaigns, counseling support, community involvement, evaluation.	Adolescent age 15-18	Undetectable Equals Untransmissible	Interpersonal
[35]	Australia	The intervention utilizes videos based on the social norm theory	HCWs	Social norms theory	Organizational
[36]	Rusia	SCRIPT (Stigma Coping to Reduce HIV Risks and Improve substance use Prevention and Treatment)	PLWH past-30-day injection drug use	Acceptance and commitment therapy (ACT)	Intrapersonal

Table 2. Categorization of HIV AIDS stigma reduction intervention across social ecological levels

Socioecological level	Examples of activities and targets identified in review
Intrapersonal	The focus is on meeting the well-being needs of PLHIV, ranging from medical requirements to support from the surrounding environment, and addressing internalized stigma.
Interpersonal	Discussion for participants involved in the intervention; providing education resources specifically targeted to the target participants; encouraging broader discussions on HIV prevention and testing within the participant group.
Organizational	Development of norms related to HIV stigma at the institutional level; training based on the Social Norms Theory.
Community	Increasing community awareness of HIV; empowering PLHIV organizations by involving them in community-wide activities.

The objective of this scoping review is to map intervention efforts focusing on reducing HIV-related stigma and targeting one or more levels of the social ecology in stigma reduction. Mapping the types of interventions focused on reducing HIV stigma can provide an alternative in shaping health programs to achieve one of the SDG's goals by 2030, namely "Good Health and Well-Being." The application of an ecological model in health problem research and intervention practice has significantly increased in recent years because the social ecological model is considered comprehensive, involving various layers of the population to change behavior that can reduce serious and common health issues [37]. The core concept of the ecological model is that behavior has various levels of influence, often involving intrapersonal (biological, psychological), interpersonal (social and cultural), organizational, community, physical environment, and policy factors. In this scoping review, a number of articles on interventions in reducing HIV stigma are mapped using the social ecological model to transparently analyze the population coverage or ecological levels implemented.

3.2. Intrapersonal: healthcare and patient well-being

Interventions at the intrapersonal level aim to reduce HIV-related stigma by focusing on meeting the needs of PLHIV both physically and mentally [38]. Providing personalized medical care for individuals with HIV helps reduce both internal and external stigma, promoting better health and well-being [29]. Meeting the needs of PLHIV not only has the potential to improve their quality of life but also to mitigate internalized

stigma by providing equal healthcare services to PLHIV [36]. Patient care interventions for HIV patients also have the potential to reduce external stigma by changing societal perceptions, humanizing the patient experience, and increasing awareness of the realities of HIV. Although the focus is on patients, the outcomes can stimulate empathy, provide positive behavioral models, and reduce uncertainty in society [39].

Two studies have involved interventions emphasizing the improvement of well-being for PLHIV by providing support for both medical and daily needs [29], [36]. Maskay *et al*. [29] developed an intervention based on the patient-centered medical home framework focusing on care development for PLHIV. The primary target of this research is PLHIV diagnosed with mental health issues or substance disorders experiencing homelessness or at risk for homelessness, as they are considered at high risk of stigmatization and discrimination. The intervention involves care for PLHIV within this population, ranging from medical treatment to providing stable housing. The intervention by Maskay *et al*. [29] focuses on reducing internal stigma from PLHIV themselves and reducing the likelihood of external stigma through direct intrapersonal interventions with PLHIV. Although this intervention focuses on the development of health and well-being for PLHIV, its steps, and implementation involve multiple parties. In addition to providing health coordinators in each area, partnerships between HIV service providers and housing providers are established, and behavioral health services are integrated into HIV services. The provision of care and well-being for PLHIV is considered capable of reducing both internal stigma because they easily access medical care, counseling, and positive support regarding their housing situation. On the other hand, over time, external stigma perceptions related to HIV, mental health disorders, drug use disorders, and homelessness are expected to decrease for PLHIV enrolled in this intervention [29]. In Luoma *et al.* [36] study, they conducted a similar intervention, caring for individuals with HIV who got exposed through drug use. While the intervention did not change stigma or drug use behavior, it did improve how individuals with HIV responded to treatment.

Healthcare services in the care of PLHIV are believed to play a significant role in reducing or preventing emotional contamination [40]. Aligned with the patient-centered medical home (PCMH) model, which can significantly support interventions to reduce stigma against individuals with HIV/AIDS [41]. In the context of PCMH, coordinated healthcare services, strong doctor-patient relationships, and effective patient information management form the basis for a holistic approach to the care of PLHIV. Through this model, PLHIV can receive care that not only considers medical aspects but also supports their psychosocial well-being [41]. A study contributing to the SDGs states that the PCMH model is one of the comprehensive supports to achieve the "Good Health and Well-Being" goal [42]. Effective coordination among healthcare teams helps reduce the potential gaps in care, decreasing internal stigma that may arise from disjointed care experiences. With a patient-centered approach, PLHIV also feel more attended to, reducing internal stigma and boosting confidence in dealing with their HIV condition. Moreover, patient empowerment emphasized by PCMH gives PLHIV control over their care, assisting in overcoming internal stigma. Thus, PCMH integration not only enhances the holistic care of PLHIV but also has the potential to be a catalyst for reducing stigma, both internal and societal [29]. The impact of the PCMH model on HIV stigma interventions varies across types of healthcare services, necessitating more efforts to investigate these changes, especially for mental health services [42].

3.3. Interpersonal: improving knowledge, attitudes, group norms, and behavior

Reducing stigma at the interpersonal level means working to improve understanding, lessen prejudice, and encourage positive relationships between individuals and those with HIV [43]. Interpersonal-level interventions aim to strengthen positive relationships, reduce stigmatization among involved individuals, create an environment supportive of individuals with HIV, and diminish the negative impact of stigma on their psychological well-being [44]. Two articles provided detailed reports on efforts to enhance knowledge, attitudes, and behaviors in each individual. Blackburn [45] utilized an online platform called HealthMpowerment as a space for discussing HIV and AIDS. The intervention adopted a type of two-way communication through an online platform in communities at high risk of HIV exposure. Conversations were built based on communication habits in the North Carolina region with prevailing norms. In this study, intervention staff sought to increase engagement and build knowledge by initiating conversations and correcting misinformation, playing an integral role in the online community [46]. This research emphasizes interventions through communication methods and norms existing in the region. Meanwhile, the study by Agaku *et al.* [34] was conducted through educational messaging, public campaigns, counseling support, community engagement, and evaluation for adolescents aged 15-18 years.

Effective stigma reduction programs that enhance positive attitudes towards PLHIV at the interpersonal level generally involve sessions of sufficient duration, described not only in a single meeting [47]. Interventions involving more than one session tend to be more intensive because participants have the opportunity to understand and apply the skills and knowledge, they learned in previous meetings [48]. Long-

duration interventions can be implemented not only in the form of workshops or training programs but also in weekly activities in a region over several months. This aligns with research protocols regarding the reduction of HIV and AIDS stigma in children using an art and culture-based approach [47]. This activity spans 24 weeks, comprising education and knowledge enhancement for students, the implementation of theater as a form of culmination from previous educational activities, and concluded with a group discussion forum regarding the performances of each group.

Additionally, a crucial consideration in implementing interventions at the interpersonal level is the intervention location [39]. Stigma is a product of social and cultural factors within society. Therefore, stigma reduction interventions for HIV that have been implemented may not necessarily be applicable in other countries due to differences in communication styles, cultures, social norms, and other local factors [47]. Interventions closely tied to social norms are developed through social norms theory and implemented in intervention strategies [35], [45]. The type of communication in the intervention is based on the formation of social norms through tools that can increase knowledge, regulate behavior by encouraging adherence to what is considered appropriate behavior by the majority of social group members [49].

3.4. Organizational: enhancement of services and prevention strategies for institutions

Interventions at the institutional or organizational level aim to reduce HIV-related stigma within the context of policies, practices, and culture within an institution or organization [50]. This involves efforts to change rules, regulations, and social norms that may contribute to stigma against HIV. Interventions at the organizational level can create a stigma-free environment, promote fair treatment for individuals with HIV, and transform organizational culture to better support those affected by HIV and their well-being [37]. Four articles selected as samples in this study focus on interventions at the organizational level, targeting a similar audience, namely healthcare workers. Interventions at this level are directed at enhancing the knowledge and attitudes of healthcare workers through workshops and training [31]–[33], [35]. Healthcare workers are a group of individuals who have frequent direct contact with PLHIV.

Interventions at the organizational level can be developed through workshops to educate healthcare workers on reducing stigma among their colleagues and social marketing campaigns to help reinforce and disseminate key anti-stigma messages in the workplace. Some campaign forms emphasize slogans such as 'Let's Stop Stigma-Be kind to yourself and others.' 'Be kind to yourself and others' [32]. Additionally, there are interventions focused on developing counseling facilities for PLHIV visiting Integrated Counseling Testing Care centers as interview subjects regarding stigma, using a 33-item questionnaire to measure the program's effectiveness [33]. Organizational-level interventions can also use promotional media as an intervention tool, such as video-based interventions based on social norms theory, specifically on how misperceptions of colleagues' attitudes can influence the professionalism and service quality provided by healthcare workers [35].

An intervention approach that has a significant impact on reducing HIV stigma is the interactive intervention for nursing school students in India [31]. The intervention consists of several sessions, each session comprising four modules that incorporate videos narrated by a narrator, interactive exercises, content reflection, and summary of key points. Additionally, there is a specific session involving around 15 intervention participants facilitated by intervention staff and a PLHIV sharing their experiences with HIV diagnosis and both positive and negative experiences with the healthcare system [32]. Organizational-level interventions primarily focus on enhancing the institution's knowledge, awareness, and empathy regarding events, namely, the stigma against PLHIV.

The effectiveness of an intervention program can be influenced by the intervention's target, setting, and the number of intervention sessions [51]. Interventions conducted on healthcare workers tend to have a significant impact on improving participants' attitudes toward PLHIV in studies both with and without a control group [31]–[33], [35]. Intervention models for healthcare professionals go beyond just increasing HIV knowledge. They also provide training to develop positive attitudes and social support, addressing stigma against individuals with HIV. This approach tends to be effective in reducing stigma. It aligns with the social cognitive theory framework used in developing interventions for healthcare professionals, emphasizing how individuals' beliefs, attitudes, and knowledge develop and change in a social context [31], [52]. By applying this theory as a foundation, stigma reduction programs can be built by considering how individuals process information, respond, and interact in situations involving HIV-related stigma or similar conditions [53]. This has the potential to enhance program effectiveness by addressing cognitive and social factors that influence stigma. Stigma reduction intervention programs for healthcare professionals can be considered promising as they are primary service providers for PLHIV during medical care and often have direct contact with PLHIV [54]. Stigma reduction intervention programs for healthcare professionals like these should be developed more widely among healthcare professionals globally [55].

3.5. Community: collaboration between organizations and sectors to increase awareness of HIV and AIDS

Interventions at the community level aim to reduce HIV-related stigma in a broader social context [43]. This involves efforts to change perceptions, attitudes, and social norms within the HIV-related community. Strategies to address HIV stigma at the community level can create an environment that is supportive, inclusive, and free from stigma towards HIV across the entire community [56]. These interventions encourage communities to play an active role in addressing stigma, increasing knowledge, and supporting individuals with HIV in achieving better well-being [56]. One community-level intervention model that builds public awareness of HIV and AIDS uses the challenge HIV stigma and gain empowerment (CHHANGE) strategy. This strategy includes a multi-component anti-HIV/AIDS stigma intervention at the community level designed to reduce HIV stigma and improve access to HIV prevention and treatment [30]. The CHHANGE intervention includes three main components: events and activities based on providing spaces for people living with HIV, such as weekly events; workshop/training curricula; and bus stop advertising campaigns. In each component, activities are designed to interrupt the process of stigmatization.

Stigma reduction interventions can be designed using the psychoeducation approach as it generally presents four types of model structures consisting of individuals, families, groups, and communities [57]. In general, psychoeducation focuses on therapy compliance, illness, treatment, and rehabilitation. This scoping review focuses on awareness and education about the disease and support from the surrounding environment [58]. Bright and Hayward argued that providing knowledge through a psychoeducational approach to reduce public stigma against HIV/AIDS can encourage help-seeking attitudes and aims to replace unfounded beliefs, such as misunderstandings about the causes, danger levels, and prognosis related to HIV/AIDS. Community-level interventions through recommended psychoeducational approaches can include public education about the recovery of mental illnesses and the availability of effective treatments, as well as sympathetic and accurate media portrayals of people with mental disorders, to increase knowledge and foster positive attitudes [59], [60].

Effective psychoeducation involves interactive education techniques, the use of multiple teaching aids, eliciting relative experiences and understanding, and avoiding confrontation [61]. The CHHANGE concept implemented by Frye *et al*. proves that a psychoeducational approach to community intervention is a suitable choice. One intervention activity carried out within the CHHANGE concept is organizing a social event called "Walk in Our Shoes," where usable shoes are exchanged for new ones to engage residents and the community of PLWHA [30]. Social activities within a community can play a crucial role in strengthening relationships among community members and reducing stigma towards PLWHA. Active participation and involvement of PLWHA in social activities not only create opportunities to better understand the experiences of PLWHA but also foster stronger emotional bonds among community members [62]. Advocating for the recognition of HIV-related "spaces" as stigma-free community resources and providing opportunities for residents to interact with targeted groups and understand the connection between HIV stigma and the prevalence of HIV/AIDS in their environment may be the key to the success of anti-stigma and discrimination programs.

Psychoeducation is closely related to training aimed at empowering PLWHA to reduce stigma within their communities by increasing awareness and proactive engagement [57]. The training, workshops, and materials delivered in these workshops aim to recognize and validate fears of the disease and transmission with adaptive responses, provide accurate information about HIV/AIDS, challenge stereotyped and deviant beliefs, increase contact with PLWHA, and build empathy [30]. These activities align with the components of psychoeducation methods that emphasize interactive education. In line with research by Ceylan and Koç [63], which states that the use of interactive educational methods can create a space for easy discussions about HIV and AIDS, which are culturally considered taboo, thereby increasing public knowledge about HIV and AIDS.

The use of multiple teaching aids in psychoeducation is also an effective technique [61]. Another intervention that can be implemented at the community level, in line with the psychoeducation approach, is public campaigns because they can intensively raise public awareness to end stigma surrounding HIV and AIDS [64]. The psychoeducation approach to the CHHANGE concept is implemented through brief periodic presentations on misconceptions about HIV in barber shops, beauty salons, and community-based organizations. Additionally, bus advertising campaigns use posters with messages stating that HIV stigma is detrimental to society [31]. Although there is ample research stating that psychoeducation approaches can positively impact community-level interventions, some existing studies still cannot adequately measure the effectiveness of psychoeducation in behavior change. One study note that research subjects are still under-researched or lack well-validated behavioral measures [65].

3.6. Challenges and gaps

Based on the mapping of the selected articles, it can be identified that there are already numerous efforts to intervene and reduce stigma among PLWHA, although not significantly developed [66]. Nevertheless, this scoping review examines various sample and study characteristics as potential influencers of intervention outcomes. According to the analysis results, intervention programs with the goal of reducing HIV stigma have a significant positive impact, albeit on a small scale. The impact includes an increase in participants' knowledge and positive attitudes towards PLWHA from before to after the program implementation [20]. Consistent with the research by Mak *et al*. [51], stating that stigma reduction programs generally have the potential to improve knowledge about HIV and positive attitudes towards PLWHA when the programs are implemented. Findings from this scoping review illustrate the need for health promotion interventions to reduce HIV stigma to go beyond the intrapersonal level and consider broader social and structural contexts to influence health and well-being, as depicted by the social ecology model. This approach can be a powerful asset in achieving the "Good Health and Wellbeing" goal, which is one of the SDG indicators.

In this scoping review, no direct research has been found that describes HIV stigma reduction interventions based on public policy, despite the fact that, in the concept of health promotion itself, the policies of a region have a significant impact on the behavior of its population [67]. Healthy behavior is considered optimal when the environment and policies support healthy choices, and individuals are motivated and educated to make those choices [68]. Educating the community to make healthy choices when the environment does not support it can only yield short-term and weak effects, which is a common occurrence. Therefore, a combination of interventions at the individual and environmental/policy levels is needed to achieve significant changes in health behavior [37]. The primary strength of a health promotion strategy lies in focusing on various levels of influence that expand intervention options. Policy and environmental changes are expected to have a broader impact on society, unlike interventions that only reach individuals or select groups who choose to participate [69]. Policy-oriented interventions in this context refer to efforts to change existing rules and incentives in an environment or community with the aim of supporting better behavior change related to HIV stigma. Therefore, policy and environmental interventions seek to create norms, rules, or incentives that can persist over a longer period.

Based on the findings of this scoping review, a common challenge often faced is the less comprehensive identification of intervention impacts, often measuring only one aspect. In reality, HIV reduction interventions can have broader impacts such as increased HIV testing, better understanding of HIV, or even improved access to HIV-related health services, but these impacts are often not specifically identified [30]. Therefore, it is crucial to develop evaluation systems that cover various aspects to comprehensively measure the impact of interventions, including indirect or secondary impacts. Additionally, more detailed measurements of factors influencing the reduction of HIV stigma need to be developed. Some studies still struggle to identify the most crucial factors in reducing HIV stigma [29]. Therefore, instruments need to be developed to enhance the understanding and measurement of the effectiveness of various interventions as credible tools in assessing intervention impact.

The developed instruments should aim to depict changes in behavior, attitudes, and knowledge relevant to HIV and measure the potential positive impacts that may occur in the targeted community or society. Improving the understanding and measurement of the effectiveness of various interventions becomes crucial in efforts to reduce HIV stigma and enhance the well-being of PLHIV [21], [70]. Valid and reliable measurements will facilitate the evaluation of each intervention aimed at reducing HIV stigma, allowing intervention designs to evolve significantly and contribute to the well-being of both individuals living with HIV and the surrounding community.

4. CONCLUSION

HIV stigma reduction programs have shown positive outcomes by increasing knowledge about HIV and improving attitudes toward individuals living with HIV. Both quantitative and qualitative evidence supports the effectiveness of these programs in reducing HIV-related stigma through various components and methods. The success of interventions depends on targets, settings, and duration, taking into account social and cultural factors since stigma is influenced by social constructs. Recognizing the negative impact of stigma on HIV prevention and care, there is a need to develop stigma reduction programs, especially at the policy level. However, this scoping review has limitations, such as focusing on common types of stigma and intervention targets. Future reviews could benefit from a more detailed exploration of specific groups, utilizing rigorous research designs and outcome measurements. This is aimed at advancing comprehensive HIV stigma reduction programs and achieving the SDGs by 2030.

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