



Public Health Strategies Against Social Stigma in the Mpox Outbreak: A Systematic Review

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Authors' contributions

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ABSTRACT

Background and Aim: In May 2022, the emergence of an outbreak of the Mpox virus was observed across multiple countries, precipitating swift global dissemination. The present Mpox outbreak exhibits unusual characteristics in contrast to antecedent occurrences. A salient peculiarity is the noteworthy incidence of confirmed cases among men who have sex with men. The aim of this research is to discern, within the current scientific literature, the most pertinent and efficacious public health strategies for preventing or mitigating Mpox-related social stigmatization.

Methods: Employing the PRISMA model, a systematic review was conducted utilizing PubMed, SciELO, and Google Scholar databases, encompassing articles published from January 2022 to January 2024. Public health strategies to prevent or mitigate Mpox social stigmatization were systematically recorded and summarized for subsequent analysis.

Results: Seven articles were identified and analyzed. None of the evaluated articles presented a comprehensive approach concerning public health strategies to counteract social stigmatization amid the Mpox outbreak scenario. The examined studies emphasize the pivotal role of interventions within three axes for public health strategies: awareness and training of healthcare professionals, targeted and sensitive communication addressing the needs of different affected groups, and medical care measures ensuring anonymity and respect for patients.

Conclusion: Confronting the proposed strategies with the key issues that trigger stigmatization, it becomes evident that a nuanced calibration of these strategies is required for optimizing the efficacy of public health guidelines implementation. Furthermore, attention to the mental health of Mpox patients is a crucial dimension that cannot be overlooked, given the psychological vulnerability of these individuals, arising from both the disease itself and social stigmatization.

Keywords: Mpox; monkeypox; social stigmatization; public health strategies; risk groups.

1. INTRODUCTION

In May 2022, a Mpox virus outbreak was identified across several countries, rapidly achieving global dissemination, as reported by the World Health Organization [1]. The Mpox virus, originally identified in 1958 during an outbreak affecting captive research monkeys in Denmark, garnered the designation "monkeypox." Human cases were first documented in 1970 in the Democratic Republic of the Congo. Subsequently, the disease has been observed in human populations within Central and West African countries [2]. Since 1970, sporadic cases and localized Mpox outbreaks in humans have been recorded in nine African countries: Cameroon, Central African Republic, Congo, Ivory Coast, Democratic Republic of the Congo, Gabon, Liberia, Nigeria, and Sierra Leone [1,3,4].

The Mpox virus is a double-stranded DNA virus belonging to the *Orthopoxvirus* genus within the Poxviridae family, the same family that includes the human smallpox virus. This viral entity is classified as a zoonosis, with the natural host yet

to be conclusively identified. Incidences of Mpox virus infections have been documented in squirrels, Gambian pouched rats, dormice, various monkey species, and other mammals [1]. Genomically, the Mpox virus is classified into two discernible clades originating in Africa. The Central clade (clade I), predominantly found in the Congo River basin, is correlated with heightened clinical severity and primarily zoonotic transmission. Conversely, the Western clade (clade II) is characterized by milder disease manifestations and is the origin for the genetic lineage responsible for the ongoing human outbreak (clade IIb) [5,6,7,8,9].

The transmission of the Mpox virus occurs through direct or indirect contact with blood, bodily fluids, skin lesions, or mucous membranes of infected animals. Furthermore, secondary person-to-person transmission may occur, involving close contact with infected respiratory secretions, skin lesions of an infected individual, or through contaminated objects and surfaces [5,6,7]. Droplet transmission requires close and prolonged contact between the infected individual and others, such as unprotected

healthcare professionals, family members, and other close contacts. The incubation period of the Mpox virus exhibits variation, typically spanning from 6 to 16 days but potentially extending up to 21 days [5,6,7]. Human-to-human transmission was considered rare until recently, requiring frequent physical contact with the infected individual for viral transmission to occur. The transmission dynamics of this disease in short-duration intimate contacts entails further studies to understand the details of this outbreak, requiring systematic data collection on new cases [1]. The clinical presentation of the classic form of the disease begins with an initial febrile period, characterized by symptoms such as fever, headache, myalgia, fatigue, back pain, and generalized lymphadenopathy. Subsequent to this phase, cutaneous lesions manifest, starting as a generalized rash on the face and rapidly disseminating across the body. Predominantly affected anatomical regions include the face, palms of the hands, soles of the feet, oral mucosa, genitalia, conjunctiva, and cornea. Lesional progression follows a sequential trajectory from macules to papules, vesicles, pustules, and crusts. While most instances exhibit a self-limiting course, pregnant, those with chronic dermatologic conditions, children, and immunocompromised subjects may experience a more severe clinical trajectory. In the conclusive stage of the disease, post-crust resolution, the individual ceases to pose a risk of virus transmission and can be released from isolation, typically occurring two to four weeks following crust detachment and skin restitution, albeit often with residual scarring [5,6,7,10]. In the most recent outbreak, individuals with HIV infections were globally disproportionately impacted, and tended to manifest more severe forms of the disease [11,12,13].

The ongoing Mpox outbreak exhibits distinctive features in comparison to previously documented occurrences. While the causes of the current outbreak remain unclear, hypotheses under consideration include diminished population immunity stemming from the accumulation of unvaccinated individuals post the conclusion of human smallpox immunization campaigns, unique ecological conditions, high-risk behaviors among men who have sex with men, or genetic mutations in the virus potentially facilitating human-to-human transmission [14]. A salient characteristic is the notable prevalence of confirmed cases among bisexual individuals or men who have sex with men [15, 16]. The latest report from the Pan American Health

Organization, as of March 2023, disclosed that 48,651 (96%) of confirmed cases in the Americas are male. Predominantly affecting individuals between 20 and 45 years old who identify as men who have sex with men, Brazil ranks second in case numbers, with 10,825 cases and 15 deaths reported by March 2023 [16]. In a comprehensive review of official records, Benito et al. [17] reported 13,915 Mpox-infected individuals in Brazil from January to October 2022. Although World Health Organization recognizes over 30 Sexually Transmitted Infections, including Mpox [18], this Health Authority initially avoided associating the disease with sexual practices at the onset of the current outbreak. Categorizing the disease as a Sexually Transmitted Infection would add another layer of social stigma to infected people and risk groups [19]. Nevertheless, the disproportionately high incidence among men who have sex with men prompted the World Health Organization to issue targeted recommendations for this population group, emphasizing the sexual dimension. This triggered various adverse consequences for their lives and health, enabling stigmatization by other societal sectors [20,21].

Recent research, employing genetic sequencing and epidemiological analysis, affirms that the clade IIb of the virus in the current outbreak is associated with sexual contact [22,23,24,25]. The classification of certain diseases as sexually transmitted infections poses challenges [22], and transmission dynamics often vary based on circumstances or strain-specific characteristics. Contemporary shifts in sexually transmitted infections transmission patterns are observable, exemplified by Mpox, previously primarily zoonotic and now linked to sexual transmission. Conversely, the bacterium *Haemophilus ducreyi*, traditionally considered an Sexually Transmitted Disease, is presenting a new challenge to public health authorities in its non-sexually transmitted form [26]. Human behavior, multifaceted in its influence, plays a central role in the dynamics of infectious disease outbreaks [27]. Acknowledging the association between the Mpox outbreak and sexual practices is essential for tailoring specific public health measures to prevent the disease. This recognition highlights the need for nuanced adjustments in health education and information dissemination strategies to avoid stigmatizing affected individuals or those belonging to risk groups.

In November 2022, the World Health Organization opted to revise the official nomenclature of the disease from "Monkeypox" to "Mpox." This decision was prompted by the recognition that Western media was employing imagery featuring individuals of African people and African descent in its coverage of the disease, nevertheless the current outbreak being primarily prevalent in Caucasian and Western-origin nations. The World Health Organization's decision was substantiated by the acknowledgment of the stigmatization faced by the Black population and the racist undertones associated with the "monkey" archetype. The primary objective of this nomenclature adjustment is to mitigate the stigma surrounding the disease and counteract the unfounded linkage to individuals of African origin or descent, who are erroneously pointed as high-risk groups. This underscores the enduring presence of discrimination and racism as contributing factors to social stigmatization, further exacerbated by information disorders within the context of the Mpox outbreak [28,29,30].

In order to prevent the stigmatization of individuals infected with the Mpox virus, risk groups, or populations erroneously associated with the disease, it is imperative to implement public health policies and public health strategies aimed at prevent or mitigate the discriminatory impact on these segments of the population. In this context, international organizations and public health authorities formulate comprehensive policy guidelines to address health issues at the population level. These guidelines encompass the establishment of objectives, priorities, and the allocation of resources to contend with specific challenges, such as the ongoing Mpox outbreak. To attain these overarching goals, concrete public health strategies are devised, encompassing specific action plans meticulously crafted to efficaciously translate policy directives into practical implementation. These strategies encapsulate targeted interventions, actions, and programs meticulously designed to yield the desired health outcomes at the population level. The aim of this research is to discern, within the current scientific literature, the most pertinent and efficacious public health strategies for preventing or mitigating Mpox-related social stigmatization.

2. METHODS

2.1 Search Strategies

A systematic review was conducted following the methodological guidelines proposed by Moher et al. [31], as updated by Page et al. [32], utilizing the PRISMA model. The objective of the review was to investigate effective public health measures to prevent or mitigate the effects of stigmatization of Mpox patients or groups at risk for this disease. The review utilized sources from databases including PubMed, SciELO, and Google Scholar.

2.2 Inclusion and Exclusion Criteria

The search employed the following descriptors: "Mpox"; "Monkeypox", "Stigma", "Discrimination", "Public Health", "Strategies", "Mitigation", "Risk Group", "men who have sex with men", and "MSM" in several combinations. The reviewed manuscripts spanned publications in English, Portuguese, and Spanish, covering the period from 2022 to January 2024. The inclusion criterion for articles was the verification of results consistent with the research objective, whose content addressed public health strategies against stigmatization of Mpox patients and risk groups.

2.3 Selection of Studies

Articles that did not meet the evaluation criteria, such as deficient or inadequate methodology and inconsistent data, were excluded. After reading the title and abstract, materials consistent with the researched topic were selected, and the articles and reports were read in their entirety. Subsequently, the material was analyzed, and a summary of the most relevant aspects of each article was written, followed by the drafting of the critical review.

2.4 Data Extraction and Acronym Definition

A multi-level screening approach was implemented, with out-of-context articles being excluded. In this phase, articles addressing public health strategies for preventing and mitigating Mpox social stigma were selected. The most crucial aspects were recorded and summarized for analysis. Acronyms for non-heterosexual groups were standardized to LGBTQ+, following the prevalent international definition. A flowchart (Fig. 1) was provided to illustrate the rationale for selecting the reference material for this review.

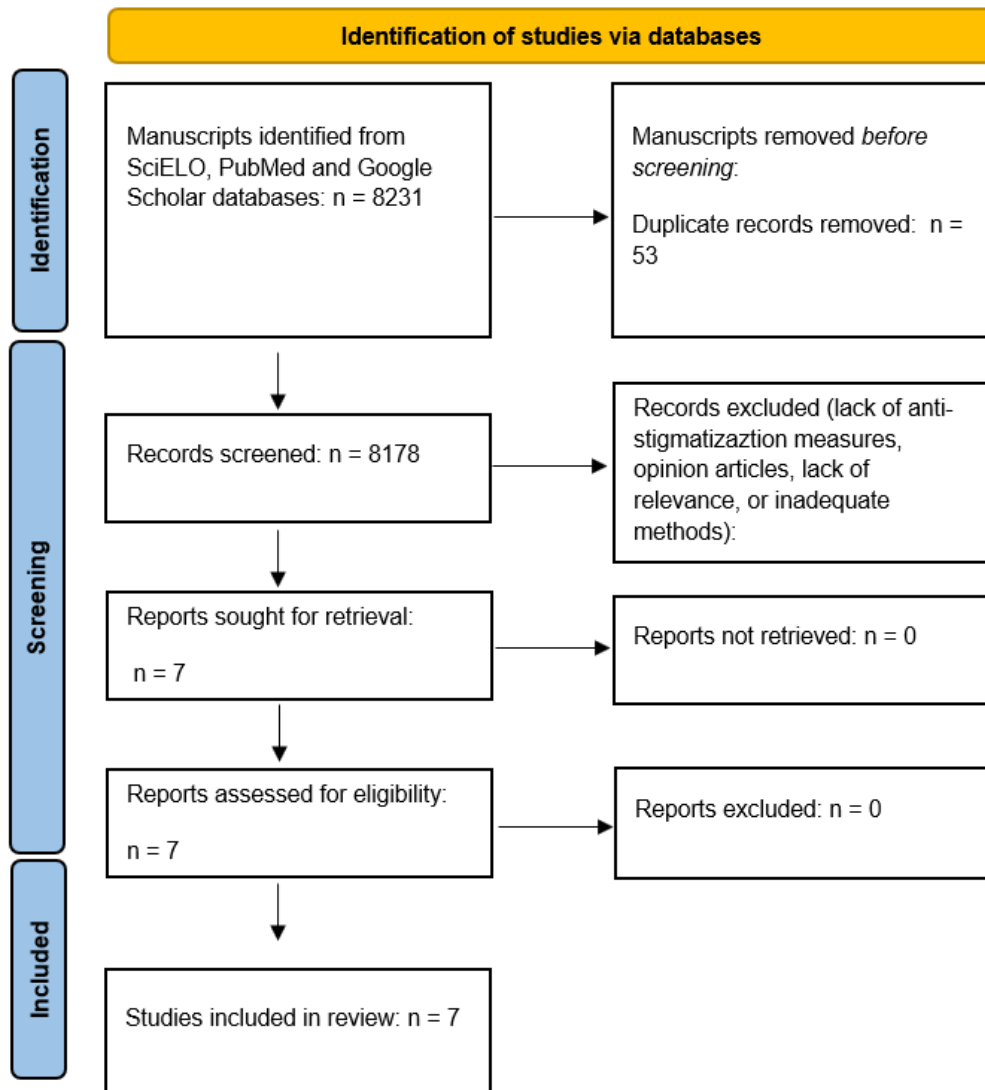


Fig. 1. Flowchart of the screening process of publications according to the PRISMA model

**Source: the authors*

3. RESULTS

Notably, despite the current scientific literature being prolific in articles addressing public health policies, discriminatory facets, and relating the stigmatization of Mpox-infected individuals, there is a paucity of scientific articles delving into the application of public health strategies for preventing or mitigating the effects of social stigmatization within the current Mpox outbreak context. None of the evaluated articles presented a comprehensive approach concerning public health strategies to counteract social stigmatization amid the Mpox outbreak scenario. Upon analysis of the referenced literature, recommendations can be synthesized into three

axes of action: raising awareness among healthcare professionals, ensuring effective communication with a non-discriminatory perspective towards the population, and implementing specific medical care measures to prevent and mitigate the impact of stigmatization on Mpox patients. Recognizing that individuals from both genuine risk groups and those falsely ascribed to such groups due to ethnic discrimination are particularly susceptible to social stigmatization, these measures must not be disregarded in the administration of effective public health interventions. The most relevant aspects of the articles dealing with public health strategies for the prevention or mitigation of social stigma in Mpox are summarized in Table 1.

Table 1. Key recommendations on references addressing public health strategies for preventing and mitigating Mpox social stigma

Reference	Focuses of the addressed public health strategies	Main recommended public health measures
Lim et al. [33]	Anonymity and respect for patients. Implementing targeted communication.	Anonymized testing procedures. Collaborative partnerships between health authorities, individual influencers and organizations representing stigmatized groups.
Yang et al. [34]	Implementing targeted communication.	Communication strategies dissociating Mpox from sexual behavior and bolstering efforts in curtailing the proliferation of stigma.
Aquino et al. [20]	Implementing targeted communication.	Communication strategies dissociating Mpox from sexual behavior and focusing in the general public.
Schmidt-Sane et al. [36]	Implementing targeted communication.	Collaboration between public health authorities and LGBTQ+ community organizations. Engage communities in the identification of cases and contact tracing. Leveraging location-based strategies, such as LGBTQ+ bars and festivals.
Passos et al. [37]	Awareness and training healthcare professionals	Establishing forums for discussion within healthcare teams, encouraging the collective development of knowledge, humanized practices and ethical considerations.
Woodward and Rivers [38]	Anonymity and respect for patients. Awareness and training healthcare professionals	Improve capacity for seamless interaction with patients, incorporating cultural sensitivity and linguistic aspects specific to the communities they serve. Conduct medical interviews with empathy, promoting trust-building relations with patients. Promote anonymity during diagnostic and treatment phases.
Bergman et al. [39]	Awareness and training healthcare professionals	Avoid of segregating the care environment for individuals with non-heterosexual practices. Empathy and positive inquiries and affirming messages during the medical history-taking process. Assuring up-to-date Mpox information and humanized practices to health teams.

Lim et al. [33] conducted a comprehensive investigation into public health strategies for preventing Mpox social stigma targeting the LGBTQ+ community in South Korea, assessing both shortcomings and successes in the implementation of these initiatives. Noteworthy strategies for effective public health management were identified in this research. The implementation of anonymized testing procedures for diagnosis played a pivotal role in diminishing stigma and progressively bolstering testing rates. Furthermore, the establishment of collaborative partnerships between health authorities and diverse organizations (both formal and informal) facilitated consultations and collaborations with stigmatized groups, contributing significantly to the control of the outbreak. Health authorities also engaged with influential figures, including digital influencers with substantial reach on social media platforms, recognized within stigmatized groups as trustworthy agents of information. These collaborations aimed at disseminating guidance on the disease and promoting measures to prevent discrimination. Beyond these measures, health authorities proactively formulated anti-discrimination strategies and sought to dissociate the image of LGBTQ+ groups from Mpox

infection. They disseminated information on non-sexual transmission routes and initiated campaigns fostering empathy, social harmony, and solidarity with individuals affected by the infection.

Yang et al. [34] proposed a four-step framework in public health communication strategies to prevent and mitigate the stigmatization of individuals infected with Mpox and those belonging to risk groups. Firstly, it involves communicating that Mpox is not fundamentally a sexually transmitted disease; instead, the primary mode of virus transmission occurs through contact with the skin, eyes, nose, or mouth. It is emphasized in public communication that establishing a direct link between Mpox infection and homosexuality is inappropriate. Secondly, the communication is guided in a precise and appropriate manner, aiming to dispel social perceptions that the disease solely arises from inappropriate sexual behavior. Thirdly, the approach discourages the use of emotionally charged language when describing Mpox. Fourthly, community engagement is advocated to bolster efforts in curtailing the proliferation of stigma. It is crucial for the community to provide public access to information and education about

Mpox. This community engagement aims to guide cultural shifts and reduce social stigma within the community, using a language that is both neutral and inclusive. This approach eases individuals infected with Mpox and risk groups in developing a sense of social support when dealing with personal stigma.

Aquino et al. [20] described faults in public health strategies within information campaigns related to the Mpox outbreak. The authors posit that targeted campaigns may introduce conceptual ambiguities, undermining effective public health responses to the outbreak and inflicting psychosocial harm upon groups spotlighted by such initiatives. Speeches grounded in unjust generalizations impede the efficacy of public health responses. Global public health efforts should conscientiously avoid resurrecting or reinforcing the antiquated notion of the "gay disease", reminiscent of the early stages of the HIV epidemic in the 1980s [35], particularly in jurisdictions where homosexual activities are criminalized. The authors assert that stigma may permeate the broader population, leading to reluctance in accessing healthcare services for conditions presumptively linked to sexual minorities. As such, campaigns should meticulously adhere to prevention guidelines, symptom identification, and the promotion of seeking medical attention.

According to Schmidt-Sane et al. [36], the collaboration between public health authorities and LGBTQ+ community organizations, along with sex workers, plays a fundamental role in the effective response to Mpox. These organizations boast established networks and well-defined outreach strategies. Response efforts can seamlessly integrate into these frameworks and may be substantiated through the provision of resources (including informational materials, care guidance, or dedicated channels for reporting and referral of cases) or financial support. Such backing aims to facilitate community engagement strategies and diminish stigma. The authors highlighted the importance of involving communities in the identification of cases and contact tracing, recognizing trust as a critical factor. Leveraging location-based strategies, such as LGBTQ+ bars and festivals, proves instrumental in reaching risk groups. These initiatives provide pertinent information and services during large-scale events, minimizing the potential for social stigma within the broader population due to their targeted and engaged audience focused on self-protection.

Passos et al. [37] evaluated strategies implemented for healthcare professionals to debunk the association between Mpox and male patients who have sex with men. The primary intervention involved establishing forums for discussion within healthcare teams, encouraging the collective development of knowledge and fostering practices characterized by increased humaneness, ethical considerations, and respect for patients. These discussion spaces served as a platform for disseminating information about Mpox, ensuring healthcare professionals were well-informed about the disease, ultimately enhancing patient care by mitigating the impact of social stigma.

Woodward and Rivers [38] conducted interviews with fifteen public health professionals representing ten public health agencies, along with four infectious disease specialists experienced in managing Mpox cases. The objective was to identify the fundamental competencies necessary for developing effective public health strategic interventions in case investigation and contact tracing. Among the attributes deemed most crucial in contacting the population most vulnerable to the disease, a notable emphasis was placed on the healthcare professionals' capacity for seamless interaction with patients, incorporating cultural sensitivity and a nuanced understanding of linguistic aspects specific to the communities they serve. The authors advocate for training healthcare professionals to conduct medical interviews with empathy, promoting trust-building relations with patients. Additionally, the preservation of patient anonymity during diagnostic and treatment phases was highlighted as another essential factor.

Bergman et al. [39] proposed the utilization of an impartial clinical attendance setting in the care provision for patients suspected of Mpox. The avoidance of segregating the care environment for individuals with non-heterosexual practices eases a more open disclosure of sexual behaviors potentially exposing them to Mpox. The authors advocate for the incorporation of positive inquiries and affirming messages regarding sexuality during the medical history-taking process, particularly when interviewing individuals expressing concerns about Mpox infection. This approach aims to mitigate psychological discomfort, conducting to an enhanced interaction and trust between the healthcare provider and the patient. Establishing empathetic communication enables patients to

more readily share potential symptoms, thereby aiding in diagnosis and the implementation of transmission mitigation strategies. On an institutional level, ensuring that the healthcare team is up-to-date with the latest information on the disease is crucial to counteract misinformation, thereby mitigating fear and social stigma associated with this infection.

4. DISCUSSION

Apart from strategies addressing social stigmatization, the predominant focus of scientific literature on public health strategies during the current Mpox outbreak focus on protocols and measures for treating Mpox patients, emphasizing hospital organization, medical care, and treatments. Specifically, the organizational aspects of hospitals, medical care delivery, and treatment protocols are emphasized. Ahmed et al. [40] offer a comprehensive overview of key hospital management measures essential for the effective care of Mpox patients. These authors advocate the recruitment of specialized healthcare professionals, preferably under 45 years old, excluding those over 60 years and individuals with comorbidities or undergoing immunosuppressive therapy. Public health managers are urged to facilitate training for healthcare professionals covering triage procedures, clinical conduct, essential care provision, and support for individuals affected by Mpox. The authors propose that this training can be efficiently conducted through online platforms, adhering to the World Health Organization guidelines and staying abreast of scientific advancements to ensure the implementation of best practices in care. Regarding physical resources, adjustments in administration, hospital space organization, supplies, resource management, and the establishment of a dedicated room for managing Mpox patients are recommended. This entails a thorough assessment of resource availability for intensive care units and other relevant departments, accompanied by the adoption of prophylaxis measures and vaccination strategies. Healthcare personnel and facility staff entering patient rooms are advised to utilize personal protective equipment, encompassing gowns, gloves, eye protection, and masks meeting N95 or superior filtration standards. Patient follow-up procedures involve the monitoring of individuals and animals exposed to the risk of transmission through contact with infected patients within a 21-day post-exposure period, with inquiries into signs and symptoms indicative of Mpox infection.

Patients confirmed to Mpox infection should undergo isolation at home or an alternative location during the manifestation period of the disease. As part of antiviral therapy, the utilization of Tecovirimat is recommended, accompanied by explicit medical guidance to patients on the proper use of this medication [40].

Goffman's conceptualization of stigma delineates it as a discernible mark or attribute linked to an individual, rendering them socially unacceptable or deviating from societal norms. These markers can manifest physically, such as visible scars, or pertain to social attributes, including membership in a minority ethnic group or having a non-heterosexual sexual orientation. Goffman posited that stigmas are often negatively perceived by society, subjecting stigmatized individuals to discrimination and prejudice [41]. Applying Goffman's concepts to the context of Mpox, it reveals multiple layers of stigmatization, as the infectious disease is characterized by visible and exuberant skin lesions, coupled with the association of cases with men who have sex with men in the recent outbreak. Moreover, there exists potential stigmatization based on the African origin of the disease, introducing prejudicial attitudes towards Black or Brown individuals falsely inputed as a risk group. The historical nomenclature - Monkeypox or "monkey smallpox" - amplifies semantic ambiguity, contributing to racial discrimination. Within the realm of public health, addressing stigma becomes imperative, necessitating efficacious and all-encompassing interventions to counteract the discriminatory repercussions during infectious disease outbreaks [42]. Stigmatizing discourses often propagate stereotyped narratives that perpetuate cycles of fear, resulting in the marginalization of vulnerable social groups and impeding individuals' access to health services [43]. Stigmatization of Mpox-infected individuals and vulnerable individuals from risk groups may be responsible for underreporting and isolation of infected people without seeking medical attention and, consequently, proper case registration and treatment [43,44,45,46,47].

Passos et al. [37], Bergman et al. [39], and Woodward and Rivers [38] assert that the updating healthcare professionals who serve risk groups for Mpox is an imperative component in public health management. This not only eases the acquisition of in-depth knowledge about the disease but also aids in dismantling biases

opinions that could difficult the effective implementation of health interventions for infected individuals. Passos et al. [37] and Bergman et al. [39] advocate for open discussions within healthcare teams as an optimal approach to reduce social stigma, ensure coherence in conduct, and promote collaboration in knowledge dissemination. Simultaneously, Woodward and Rivers [38] suggest training healthcare professionals to conduct anamnesis with a focus on empathy, emphasizing the importance of establishing trust-relations with patients. Combining these recommendations is complementary, and their orchestrated implementation by public health authorities constitutes a significant step in refining protocols for addressing the population affected by the Mpox outbreak. Training healthcare teams through online platforms, as endorsed by the World Health Organization [40], would standardize healthcare procedures and knowledge exchange among teams, ensuring alignment with prevailing public health policies and harmonize protocols and attendance flows between different health care facilities, if needed for the patient management.

The majority of the evaluated articles emphasize the central role of general public awareness and for the most affected groups in the prevention and control of the Mpox outbreak [33,34,36,38]. Communication, as elucidated by Bragazzi et al. [48], assumes a central role in public health strategies. According to Bragazzi et al. [48], this communication should actively involve both the sender and the receiver (in this case, health authorities, organizations and individual influencers as senders, and the general public, and the non-heterosexual community, especially men who have sex with men, as receivers), as health communication is a complex, multidimensional, and multi-stage process. Yang et al. [34] and Lim et al. [33] emphasize the need for different strategies in efficient public health communication for two distinct audiences, the risk groups, and the general population. This proposition seems to be the most suitable to avoid the errors in awareness campaigns pointed out by Aquino et al. [20], mainly by using specific communication channels for the groups most affected by the outbreak, reducing the risks of stigmatization. These multi-level communication actions, however, require even greater effort and necessary complexity to achieve success in reaching and impacting the target audiences. Schmidt-Sane et al. [36] and Lim et al. [33] accentuate the indispensability of contact

networks in diffusing accurate information within vulnerable populations. Critically, investigations into the general population and key groups regarding their comprehension of the disease, perceptions of discriminatory reactions, socially stigmatizing responses, and instances of informational disarray [49,50,51,52] become imperative to adjust the discourse, target audience, and content of public health information campaigns to prevent or mitigate the social stigma attributed to Mpox-infected individuals and socially discriminated groups.

Effective communication strategies should also be employed in vaccination campaigns to prevent stigmatization. While the willingness to vaccinate is notably satisfactory among stigmatized groups, exceeding that of the general population [50,52,53,54,55], men who have sex with men and conceal their sexual orientations exhibit lower enthusiasm for Mpox vaccination, diagnostic testing, and reporting immunization against Mpox [47]. This concealment may be linked, among other psychological factors, to the apprehension of stigma associated with sexual orientation, exacerbated by the potential stigmatization related to Mpox infection. This finding highlights the imperative need for multi-level communication strategies, coupled with anonymity protocols, to broaden the accessibility of health services for individuals resistant to seeking care due to Mpox-related stigma. Consequently, while the propositions of Schmidt-Sane et al. [36] and Lim et al. [33] align more coherently with reaching the specific audience identified within the community of men who have sex with men, the assertions of Yang et al. [34] and Aquino et al. [20], which posit the dissociation of Mpox prevention from sexual behaviors, may effectively resonate with a segment of men who have sex with men that has concealed their sexual orientations. This awareness campaign strategy for a group less likely to follow communication channels aimed at the non-heterosexual public could potentially result in reduced resistance to vaccination and enhanced engagement with healthcare systems. This approach, emphasizing anonymity throughout the stages of screening, diagnosis, treatment, and follow-up of the infection, aligns with the proposals expressed by Lim et al. [33], Woodward and Rivers [38], and Bergman et al. [39].

A prominent risk for stigmatization in the context of the Mpox outbreak is the presence of discriminatory, inaccurate, or alarmist content on

social media. Although levels of misinformation and stigma in social media posts have decreased since the beginning of the outbreak [56], a substantial portion of the content still manifests inaccuracies, informational gaps, and elements that contribute to the stigmatization of infected individuals, real risk groups or falsely attributed risk groups [57,58,59,60,61,62,63,64]. Mental health of infected individuals in quarantine during the clinical course of the Mpox disease may be particularly affected by stigma through social media misinformation posts. The necessary isolation during the clinical manifestation of Mpox symptoms keeps infected individuals away from gathering places such as bars and festivals, where the information strategies proposed by Schmidt-Sane et al. [36] would be applied. The unregulated and anarchic nature of information propagation on social media eludes the oversight of public health authorities, necessitating counteractive measures to thwart the dissemination and entrenchment of ideas conducive to the social stigmatization of those impacted by the Mpox outbreak. In this context, the recommendations of Lim et al. [33] regarding collaborative efforts between digital influencers and health authorities to generate content grounded in scientific rigor, coupled with psychologically supportive guidance for individuals in isolation, assume significance in mitigating the ramifications of stigmatization and the psychological sequelae arising from quarantine. Healthcare professionals, especially those responsible for mental health in the follow-up of these patients, should advise for the necessity of accessing secure and socially destigmatizing information throughout the isolation period, suggesting sources endorsed by public health authorities.

Lim et al. [33], Woodward and Rivers [38], and Bergman et al. [39] address topics related to specific medical care measures aimed at prevent and mitigating the effects of stigmatization on Mpox patients. According to these authors, the implementation of diagnostic tests ensuring anonymity is crucial for reaching individuals who may be infected without the fear of stigmatization. Bergman et al. [39] further highlight essential factors, such as the non-segregation of healthcare spaces for individuals with non-heterosexual practices and the conduct of anamnesis with positive and non-discriminatory attitudes towards sexuality. The adoption of such practices, directed by public health guidelines and good practices, prevent and mitigate issues caused by social

stigmatization and humanizes the necessary medical care for the detection and treatment of Mpox infection. A robust doctor-patient relationship, founded on respect and trust, is fundamental for the success of treatment [65], especially when isolation due to the disease is necessary to prevent its spread to others and to shield the patient from potential acts of social discrimination due to the conspicuous lesions of Mpox.

Although not explicitly addressed in articles specifically focused on public health strategies for Mpox patients, it is essential to consider the mental health dimension of these individuals. Diseases associated with social stigmas often lead to psychosocial or psychiatric complications, including social isolation, depression, or even suicidal tendencies [46,66]. Aroyewun et al. [67] argue that the signs and symptoms of Mpox, as well as strategies to control its spread, are linked to stressors such as fear, panic, anxiety, anger, boredom, exhaustion, social isolation, financial loss, and corporeal and social stigma. The exacerbation of these stressors during isolation, fueled by social media posts that promote Mpox-related social stigmatization [56,57,58,59,60,61,62,63,64,68], must not be overlooked. Adler et al. [69] highlight that over 25% of hospitalized Mpox patients experience anxiety or depression necessitating counseling. Moreover, Mpox patients with HIV are more susceptible to anxiety [70]. Considering the psychological vulnerability of patients already stigmatized by the virus, their mental health should be integrated into the comprehensive set of public health management measures throughout the treatment process. This encompasses addressing psychological distress related to skin lesions caused by the disease and social stigmatization, necessitating isolation for a recommended period of 21 days. The mental health repercussions during isolation and quarantine, witnessed during the recent COVID-19 pandemic, underscore the importance of prioritizing mental health support and intervention [69,71,72,73].

Hodson et al. [74] state that the ongoing Monkeypox outbreak, given its complexities extending beyond the singular surge in infections, requires a multidisciplinary approach. Although none of the reviewed articles comprehensively addressed all facets of public health management, the amalgamated strategy outlined in the three axes synthesized through the literature analysis should include the mental

health dimension in the care protocols for individuals within risky groups and those with confirmed infection. Adopting a holistic approach to manage the array of public health strategies, encompassing these multifaceted dimensions, becomes essential for the implementation of effective measures in preventing and mitigating the social stigma associated with Monkeypox.

In the systematic review article addressing Mpox social stigma, it is crucial to acknowledge and discuss the inherent limitations to provide a comprehensive understanding of the findings. Firstly, the diversity in methodologies and interpretations across the included studies poses a challenge to synthesizing the results consistently. This variation may introduce biases and affect the overall reliability of the conclusions drawn. Additionally, the temporal aspect of the studies across the outbreak course may contribute to limitations, as societal perceptions and attitudes towards Mpox may evolve over time. Despite these limitations, recognizing and openly discussing these constraints enhances the transparency and credibility of the systematic review, allowing readers to interpret the findings and the complexities surrounding Mpox-related social stigma.

5. CONCLUSION

The analysis of scientific literature reveals the intricate nature of the challenge associated with mitigating the social stigma linked to Monkeypox. The current outbreak scenario introduces an additional layer, extending beyond the physical stigmata of skin eruptions, incorporating pre-existing discrimination directed to risk groups, especially men who have sex with men, and falsely attributed risk groups, such as individuals of Black people or with African origin. To address this multifaceted issue comprehensively, the examined studies underscore the critical importance of public health strategies in three axes: raising awareness and training healthcare professionals, implementing targeted communication that is sensitive to the needs of different affected groups, and adopting medical care measures that ensure anonymity and respect for patients.

Confronting the proposed strategies with the key issues that trigger stigmatization, it becomes evident that a nuanced calibration of these strategies is required for optimizing the efficacy of public health guidelines implementation. The training of healthcare professionals should be

oriented toward imbuing them with the skills to conduct medical anamnesis fostered with empathy. In the realm of targeted communication, the adoption of multilevel strategies is advocated to effectively reach diverse and vulnerable population segments. Concerning medical care, the implementation of protocols ensuring the anonymity of diagnostic tests, the non-segregation of healthcare spaces for individuals with non-heteronormative practices, and the exercise of positive, non-discriminatory attitudes toward sexuality during medical history inquiries emerges as essential measures to prevent and mitigate the social stigmatization of patients within risk groups for the disease and those infected with the Mpox virus.

Beyond the strategies described in the literature review, the consideration of mental health among Mpox patients emerges as a compulsory dimension that demands careful attention. This imperative arises from the psychological vulnerability of these individuals, stemming from both the intrinsic nature of the disease and the social stigmatization. As social stigma can have significant psychological effects, individuals who feel threatened, those who develop the infection, and especially those who require quarantine due to the clinical progression of the disease need support and guidance to prevent the effects of stigmatization or the necessary social isolation until the Mpox recovery process is achieved. A comprehensive public health action must incorporate the three axes, plus the mental health dimension, to achieve better results in the prevention and mitigation against Mpox social stigma.

CONSENT AND ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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