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Review Article

Socio-cultural and structural determinants of STI awareness and care among young men in Pakistan: A narrative review

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Abstract

Sexually transmitted infections (STIs) remain an important public health concern in Pakistan, particularly among young men, despite increasing policy attention and expanding digital health initiatives. Existing responses have largely emphasized biomedical interventions and health-information provision, with less attention to the social and cultural contexts in which sexual health information is understood and acted upon. This narrative review explores the sociocultural, gendered, and structural factors shaping STI awareness, prevention, and health-seeking practices among young men in Pakistan. The review draws on interdisciplinary literature published between 1980 and 2025, including research from public health, medical sociology, and anthropology, alongside relevant policy documents and selected grey literature. Sources were identified and refined iteratively according to their relevance to the review objectives and contribution to the central themes. An interpretive thematic approach was used to synthesize the literature. Four interrelated themes emerged: STI-related stigma and moralization; the influence of masculine norms on sexual health attitudes and care-seeking; the gap between digital access and meaningful digital health literacy; and the disconnect between institutional interventions and the social environments in which young men negotiate sexual health knowledge and behaviors. The synthesis indicates that STI vulnerability among young men cannot be adequately understood through biomedical or informational frameworks alone. It is shaped by the interaction of stigma, gender norms, digital information environments, and structural conditions within health systems. These factors may limit the extent to which increased access to information, digital outreach, and biomedical services translate into sustained engagement with STI prevention and care. The review highlights the need for socially and culturally responsive STI prevention strategies, including male-inclusive health education, stronger digital health literacy, and interventions aligned with the lived realities of young men in Pakistan.

Keywords: Sexually Transmitted Infections, Sexual Health, Young Men, Digital Health Literacy, Gender Norms, Pakistan, Public Health.

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Introduction

Sexually transmitted infections (STIs) continue to constitute a major and persistent global public health challenge. The World Health Organization estimates that more than one million new STI cases are acquired daily worldwide, with four curable infections; chlamydia, gonorrhoea, syphilis, and trichomoniasis accounting for the majority of reported cases [1]. When left untreated, these infections can lead to severe and long-term health consequences, including chronic pelvic pain, infertility, adverse neonatal outcomes, and heightened vulnerability to HIV infection [1]. Despite the availability of effective biomedical prevention and treatment strategies, progress in STI prevention and awareness remains uneven, particularly in low- and middle-income countries (LMICs), where health systems are frequently overstretched and access to culturally appropriate, comprehensive sexual health education remains limited [2].

In Pakistan, the burden of STIs represents an increasingly urgent yet insufficiently documented public health concern. Although national HIV prevalence has historically remained lower than in many high-burden regions, recent evidence indicates rising infection rates among specific populations, including men who have sex with men, transgender communities, and people who inject drugs [3]. Other preventable infections, such as hepatitis B and human papillomavirus (HPV), remain underdiagnosed and poorly monitored, reflecting a convergence of cultural silence, inadequate screening mechanisms, and constrained health system capacity [1] These structural limitations contribute not only to gaps in surveillance and care but also to the persistence of misinformation and the reinforcement of stigma surrounding sexual health and sexually transmitted infections [4].

Sexual health in Pakistan is embedded within a sociocultural landscape where discussions of sexuality are frequently constrained by moral, religious, and social norms. Within this context, STIs are often framed as indicators of moral transgression or as consequences of "Westernized" lifestyles, positioning sexual illness within discourses of shame, deviance, and social transgression rather than health and wellbeing [5]. Such moralized constructions discourage open dialogue and significantly limit individuals' willingness to seek information, testing, or medical care, even when symptoms are present.

The consequences of this silence are reflected in patterns of delayed diagnosis, incomplete treatment, and limited public understanding of STI transmission and prevention. Misconceptions about STIs remain widespread, particularly among young men, many of whom believe that infections can be transmitted through casual physical contact or shared household items assumptions that point to substantial gaps in structured sexual health education [6]. Institutional reluctance to engage explicitly with sexual health topics, coupled with the absence of comprehensive sexuality education across formal educational settings, further entrenches misinformation and reinforces social marginalization.

Efforts to address STIs in Pakistan have predominantly prioritized biomedical interventions and information-based public health campaigns. While clinically essential, such approaches often fail to account for the social meanings, cultural values, and everyday realities that shape sexual health behaviors and decision-making processes [7]. Health promotion initiatives are frequently delivered through centralized, top-down

models that emphasize message transmission rather than dialogue, participation, or community engagement, thereby limiting their resonance with intended audiences [8].

These limitations are particularly pronounced in a context characterized by public mistrust in state institutions and heightened religious sensitivities, both of which undermine the credibility and reach of official health communication [9]. Although digital media and online platforms have increasingly been promoted as potential solutions to these challenges, access to technology alone does not guarantee meaningful engagement. Without sustained attention to cultural relevance, trust, and individuals' interpretive capacities, digital health interventions risk reproducing existing social inequalities and failing to address the deeper structural determinants of sexual health.

Young men, particularly those enrolled in universities, occupy a pivotal yet underexplored position within Pakistan's sexual health landscape. This population represents one of the most digitally connected segments of society; however, their engagement with sexual health information remains constrained by stigma, misinformation, and the absence of safe, trusted spaces for discussion [6]. Dominant social expectations of masculinity emphasizing emotional restraint, self-reliance, and risk-taking further discourage health-seeking behavior and open communication around sexual health concerns [10].

As a result, young men exist within a persistent paradox: they are highly connected to digital platforms while remaining systematically excluded from meaningful and culturally appropriate sexual health education. Despite their potential influence as peers, intimate partners, and future decision-makers, men continue to occupy a peripheral position within youth-focused sexual health interventions, which often prioritize women or narrowly defined high-risk groups while overlooking the broader role of masculinity in shaping sexual health outcomes.

Although research on STIs in Pakistan has expanded in recent years, much of the existing literature remains predominantly clinical or epidemiological in orientation, offering limited insight into the social and cultural processes that shape sexual health knowledge, attitudes, and behaviors. Few studies examine how gender norms, sociocultural stigma, and digital engagement intersect to influence STI awareness, particularly among male university students, a population that is simultaneously vulnerable, digitally connected, and underserved [11 - 13]. Moreover, narrative reviews that synthesize this interdisciplinary body of evidence remain scarce, particularly those that center young men and masculinity within the Pakistani context.

This narrative review seeks to address this gap by integrating perspectives from public health, sociology, and anthropology to examine how young men in Pakistan acquire, interpret, and act upon knowledge of sexually transmitted infections. In doing so, the review positions masculinity and digital health literacy as central analytical lenses and highlights the potential of culturally grounded, participatory, and digitally inclusive approaches to sexual health promotion. By foregrounding young men as active agents rather than passive recipients of health information, this review contributes an original and contextually grounded synthesis to the existing literature [14 – 15, 9].

Existing scholarship on sexually transmitted infections in Pakistan has been dominated by

biomedical surveillance and behavioral risk framings, leaving the social and institutional production of STI risk among young men largely unexamined. In particular, there is a clear analytical gap in understanding how moral stigma, gendered constructions of masculinity, and sustained institutional silence shape men's sexual health knowledge, perceptions of risk, and engagement with care. This gap is especially pronounced in relation to digital sexual health, where digital health literacy has been treated primarily as a matter of access and information, with little attention to its cultural and gendered mediation within Pakistani society.

This review addresses this lacuna by providing the first integrative synthesis that centers young men in Pakistan and situates both offline and digital sexual health practices within their socio-cultural and institutional contexts. By treating Pakistan as an analytically generative setting rather than a descriptive case, the review offers a novel framework for examining how stigma, masculinity, and digital mediation jointly condition sexual health practices, thereby establishing a previously absent foundation for male-inclusive and contextually grounded STI prevention. Accordingly, this review is guided by the following research question:

How do young men in Pakistan acquire, interpret, and act upon knowledge of sexually transmitted infections (STIs), and in what ways do sociocultural norms, gender expectations, and digital engagement shape their awareness, perceptions, and participation in sexual health promotion?

Methodological approach

Rationale for a narrative review

This study adopts a narrative review approach to explore STI awareness and prevention within the sociocultural context of Pakistan. A narrative design was considered appropriate because the research question spans multiple disciplinary perspectives, including public health, sociology, anthropology, gender studies, and digital health. STI-related knowledge and health-seeking practices are shaped not only by biomedical factors but also by social norms, gender relations, stigma, moral discourses, institutional practices, and everyday experiences. These dimensions are therefore better examined through an interpretive synthesis of diverse forms of evidence than through a narrowly standardized review framework.

Narrative reviews are particularly suited to questions involving heterogeneous literature in which empirical studies, theoretical perspectives, and policy-oriented evidence address different aspects of a complex phenomenon. The purpose of this review was therefore not to provide an exhaustive or statistically aggregated account of all available studies, but to bring together relevant evidence and identify recurring patterns, conceptual relationships, gaps, and areas of tension within the literature. This approach was considered particularly appropriate for Pakistan, where evidence on sexual health is diverse and unevenly distributed across disciplines and populations.

Identification and scope of the literature

Relevant literature published between 1980 and 2024 was identified through a broad and iterative search process. The extended period was selected to capture foundational scholarship on sexual health and sociocultural processes alongside more recent research addressing digital communication, health literacy, and

contemporary sexual health practices. Searches were undertaken across PubMed, Scopus, and Google Scholar to identify literature spanning public health, sociology, anthropology, gender studies, and related fields.

The search process was complemented by examination of reference lists and purposive identification of additional sources that were considered particularly relevant to the review question and emerging analytical themes. The literature included peer-reviewed studies, reviews, conceptual contributions, and relevant policy or institutional sources. Priority was given to evidence concerning Pakistan, while literature from other South Asian and LMIC settings was considered where it offered meaningful comparative or conceptual insight.

Consistent with the narrative nature of the review, the literature was not subjected to the formal identification, screening, eligibility, risk-of-bias assessment, or reporting procedures associated with systematic reviews. Instead, sources were considered on the basis of their relevance, contextual value, methodological contribution, and usefulness to the interpretive synthesis. The literature search and selection process was iterative, and the body of sources considered evolved during the development of the review as the analytical focus was refined.

Inclusion logic and analytical orientation

Selection of literature was guided primarily by relevance to the research question and analytical framework rather than by an intention to achieve exhaustive coverage. Sources were considered for inclusion when they addressed STI awareness, sexual health knowledge, sexuality education, prevention, health-seeking practices, or related sociocultural and digital dimensions within Pakistan or, where relevant, comparable LMIC and South Asian contexts.

Particular attention was given to literature examining gender and masculinity, stigma, social and cultural norms, religious or moral discourses, structural barriers, health communication, digital health, and access to sexual health information and services. Only English-language publications for which sufficient full-text information was accessible were considered. Sources that were exclusively clinical, laboratory-based, or epidemiological and did not contribute to the social, behavioural, cultural, institutional, or interpretive dimensions of the review were generally excluded.

The selection process was not fixed at the outset. Sources initially considered relevant were reassessed during the writing and synthesis stages, and some were subsequently omitted where they were found to have limited relevance to the developing argument, substantial thematic overlap with stronger sources, or insufficient contribution to the review's analytical objectives. This iterative process is consistent with the flexible and interpretive character of narrative reviewing and was used to maintain coherence between the literature and the review question.

Interpretive and thematic synthesis

The selected literature was examined through an interpretive thematic approach. Sources were read iteratively and considered in relation to four interconnected analytical domains: (1) sociological and anthropological perspectives on health and illness; (2) STI-related knowledge, awareness, and prevention; (3) sociocultural barriers, stigma, and misconceptions; and (4) digital platforms, digital health literacy, and sexual health communication.

Themes were developed through sustained engagement with the literature rather than through a rigid, predetermined coding framework. Attention was given to recurring concepts as well as differences, contradictions, and contextual variations across studies. Where findings differed, these differences were considered in relation to variations in study populations, disciplinary perspectives, research designs, geographical settings, and sociocultural contexts. Divergent findings were therefore retained where they offered useful insight into the complexity of STI awareness and sexual health engagement rather than being treated as inconsistencies requiring resolution.

The synthesis continued until additional literature was no longer contributing substantially different conceptual insights to the principal themes. This criterion of conceptual sufficiency, rather than statistical or thematic saturation in the sense used in primary qualitative research, was used to determine when further literature was unlikely to materially alter the central interpretive synthesis.

Ethical considerations

This narrative review was undertaken as part of a broader doctoral research project and was completed prior to the commencement of primary data collection. Ethical approval for the overarching study was granted by the Human Research Ethics Committee of Swinburne University of Technology, Australia (Ref. No. 20201368-4361; Modification Ref. No. 20201368-4447).

Thematic synthesis

Theme 1: STIs as socially produced risk in Pakistan

In the Pakistani context, sexually transmitted infections (STIs) cannot be adequately conceptualized through biomedical paradigms alone; rather, they emerge as socially produced risks, shaped by stigma, moral governance, and entrenched cultural silence. Sociological and anthropological scholarship has long argued that illness is not simply a biological phenomenon but a socially embedded experience, constituted through systems of meaning, power relations, and institutional practices [16 - 17]. Within medical anthropology, particular attention is paid to the role of cultural beliefs and local knowledge systems in shaping how symptoms are interpreted, causality is assigned, and decisions regarding care-seeking are made [18, 7].

Within Pakistan, religious conservatism and patriarchal social organization position sexual health as a morally sensitive and largely taboo domain, constraining both public discourse and institutional responsiveness. STIs are frequently framed in moral terms and associated with perceived immorality or “Western” lifestyles, generating fear, shame, and silence around testing, disclosure, and treatment [5]. Such moralizations may discourage timely engagement with health services and sustains widespread misinformation, including inaccurate beliefs about modes of transmission and personal risks. These contemporary dynamics are further reinforced by historical legacies, including early biomedical classifications of HIV/AIDS as “gay-related immune deficiency” [19] and enduring associations between STIs and deviance, which continue to inform social attitudes within conservative settings [20].

From a sociological standpoint, these processes reflect broader structural determinants that extend beyond individual awareness or knowledge deficits. Medical

sociology highlights how class position, gender relations, religious norms, and levels of institutional trust interact to shape health behaviors and access to care, often producing patterned inequalities in exposure, diagnosis, and treatment [21]. Where such structural influences remain insufficiently addressed, public health responses risk becoming fragmented and limited in their effectiveness [22 - 23]. In Pakistan, weak disease surveillance mechanisms, systematic underreporting, and limited policy prioritization further obscure the scale of STI prevalence, reinforcing the perception of STIs as marginal or exceptional rather than as enduring public health concerns [24 - 25].

Taken together, the literature suggests that STI-related stigma in Pakistan persists not because of an absence of biomedical knowledge or clinical infrastructure, but because sexual infections are embedded within moral discourse, religious framing, and institutional silence. When STIs are socially constructed as moral transgressions rather than collective health issues, disclosure is inhibited, care is delayed, and prevention efforts are compromised. In this sense, stigma functions not merely as a social consequence of infection but as an active mechanism through which STI risk is continually reproduced, ensuring that social meanings remain central to health outcomes even where nominal awareness exists.

Theme 2: Masculinity, gender norms, and men's sexual health

Normative constructions of masculinity play a central role in shaping how men in Pakistan engage with sexual health knowledge, services, and care-seeking practices. While male sexuality is often tacitly acknowledged within social discourse, it remains largely absent from formal education curricula and public health programming, rendering men's sexual health marginal within institutional and policy frameworks [26]. This absence is sustained by dominant masculine ideals that prioritize stoicism, self-reliance, and emotional restraint, values that actively discourage men from seeking information, disclosing symptoms, or accessing sexual health services, even in the presence of perceived risk or illness [10].

Empirical studies consistently indicate that men experiencing symptoms suggestive of sexually transmitted infections (STIs) frequently delay or avoid treatment due to fear of shame, social judgments, and unintended exposure within family or community settings [27]. Among younger men, particularly university students, limited awareness and weak engagement with preventive practices persist, shaped by the absence of structured sexuality education and the normalization of silence around male vulnerability [28]. Long-standing misconceptions surrounding sexual practices and bodily processes, including masturbation and nocturnal emissions, further illustrate how masculinity becomes intertwined with moral anxiety and misinformation, reinforcing confusion rather than informed and proactive health-seeking behaviors [29].

University-aged men therefore occupy a paradoxical social position. Despite being among the most educated and digitally connected segments of the population, their engagement with sexual health remains constrained by entrenched gender norms and sustained institutional neglect. The marginal positioning of men's reproductive and sexual health within public health systems, coupled with the limited availability of male-friendly services, continues to reproduce their exclusion from sexual health promotion initiatives [25]. Media accounts similarly reflect this structural neglect, drawing attention to the near absence of dedicated

male reproductive health services across Pakistan [30].

Taken together, the literature suggests that the limited effectiveness of male-focused STI interventions in Pakistan cannot be attributed solely to insufficient outreach or service availability, but rather to deeply embedded gender norms that frame help-seeking as a sign of weakness and normalize men's silence around sexual health concerns. Where masculinity remains unexamined within policy and program design, men's sexual health continues to be rendered invisible, undermining sustained and meaningful efforts to engage young men in prevention, diagnosis, and care.

Theme 3: Digital health (access without understanding)

The rapid expansion of digital technologies in Pakistan has substantially increased access to health-related information, particularly among urban youth. However, this growth in digital connectivity has not been accompanied by corresponding improvements in digital health literacy. As articulated in the Ottawa Charter for Health Promotion, health literacy extends beyond mere access to information to include the capacity to interpret, critically evaluate, and apply information in ways that support informed health-related decision-making [31]. Within Pakistan, low levels of general literacy, weak health communication infrastructures, and persistent sociocultural taboos continue to constrain individuals' ability to engage meaningfully with the health information now widely available through digital platforms.

Crucially, digital competence should not be conflated with digital health literacy. Norman and Skinner distinguish basic technological proficiency from digital health literacy by emphasizing the latter's reliance on higher-order cognitive skills, including critical appraisal, contextual interpretation, and the ability to assess informational credibility [32]. While existing research indicates that university students in Pakistan are generally confident users of smartphones and social media platforms, many lack the evaluative skills required to differentiate credible, evidence-based, and culturally appropriate sexual health information from misleading or stigmatising content [33]. As a result, online spaces are frequently saturated with misinformation, moralizing narratives, and judgments-laden messaging, which shape perceptions of sexual health rather than fostering informed and critical engagement [34 - 35].

Digital platforms are often perceived as private and anonymous, rendering them particularly attractive in socially restrictive contexts where open discussion of sexuality remains taboo. However, rather than functioning as neutral or emancipatory spaces, these platforms frequently reproduce the same patterns of stigma, silence, and moral anxiety that characterize offline social environments. Empirical evidence from Pakistan demonstrates that misconceptions surrounding sexuality remain widespread among young men and continue to discourage engagement with accurate information and formal sexual health services [29, 36].

Taken together, this body of literature suggests that the limitations of digital sexual health initiatives in Pakistan are driven less by deficits in access and more by the underdevelopment of critical digital health literacy. In the absence of culturally grounded content, opportunities for guided interpretation, and mechanisms that actively counter misinformation while preserving users' need for anonymity, digital platforms

risk reinforcing confusion and stigma rather than enabling informed sexual health practices. In this sense, digital health technologies operate as extensions of existing social structures, amplifying prevailing norms unless they are intentionally designed to promote critical engagement and contextual understanding.

Theme 4: Institutional and policy disconnects

Institutional responses to sexually transmitted infections (STIs) in Pakistan reveal a persistent misalignment between policy designs and lived social realities. Government-led initiatives, including digital interventions such as the VIYA chatbot, signal attempts to modernize sexual health education; however, levels of awareness and uptake among university students remain limited [37, 38]. Centralized and top-down communication strategies frequently fail to resonate with young audiences, particularly where messaging does not align with prevailing cultural norms or address gender-specific concerns relevant to men's everyday experiences.

Beyond VIYA, digital sexual-health interventions include web, SMS, social-media, and interactive platforms for information and service access. In LMICs, Tanzania's m4RH programme demonstrated sustained engagement with SMS-based sexual-health information [39]. Reviews show improved sexual-health knowledge through digital interventions, although behavioural effects are less consistent [40], while technology-based approaches support STI/HIV prevention and safer-sex decision-making [41]. Digital access, however, does not equal digital health literacy, which requires the ability to evaluate and apply credible health information. For young men in Pakistan, interventions should therefore be culturally appropriate, trustworthy, privacy-sensitive, and actionable.

This institutional disconnect is further intensified by the limited availability of male-friendly sexual health services. Public health programs in Pakistan have largely prioritized women or narrowly defined high-risk populations, positioning young men at the periphery of intervention efforts despite their central role in STI transmission dynamics [42]. Fragmented governance arrangements, inconsistent funding streams, and weak coordination between the health and education sectors further constrain institutional capacity to deliver sustained, coherent, and contextually relevant sexual health engagement.

At the same time, resistance to sexuality education remains pronounced at the institutional level. Parents, educators, and policymakers frequently oppose comprehensive sexual health programs on moral or religious grounds, restricting both their availability and quality within formal educational settings [43]. Although a small number of culturally responsive and co-designed digital initiatives have demonstrated potential to engage young people more effectively [35, 44], such approaches remain isolated pilots rather than being systematically integrated within national policy frameworks.

Taken together, the literature suggests that the limited effectiveness of STI-related policies and campaigns in Pakistan stems less from informational deficits than from a lack of trust, cultural relevance, and alignment with the everyday realities of young men. Where interventions are developed without participatory input, gender sensitivity, or institutional coherence, they risk reproducing social distance rather than fostering meaningful engagement. As a result, policy

efforts remain disconnected from the populations they are intended to serve, undermining the sustainability and long-term impact of STI prevention and sexual health education initiatives.

Discussion

Interpreting the synthesis

This discussion interprets the synthesized body of literature to explain why efforts to prevent and manage sexually transmitted infections (STIs) in Pakistan have achieved limited progress, despite expanding digital access, growing biomedical capacity, and sustained policy commitments. The synthesis indicates that stigma, gender norms, and structural inequalities operate in mutually reinforcing ways, shaping how sexual health knowledge is produced, circulated, and acted upon. Rather than reflecting technical or informational shortcomings alone, the persistence of STIs must be understood as the outcome of deeper sociocultural and institutional processes. Four interrelated explanations are examined: the persistence of stigma, the marginalization of men within STI policy, the underperformance of digital interventions, and the added value of an interdisciplinary analytical approach.

Why stigma persists despite awareness

The continued salience of STI-related stigma in Pakistan cannot be attributed to informational deficits alone. Instead, stigma is sustained through the cultural reproduction of shame and the moral regulation of sexuality, which position sexual illness as a marker of deviance or social failure. HIV, in particular, remains strongly associated with non-heteronormative behavior and moral transgression, intensifying discrimination and fear of social exclusion [19]. Within such a moral landscape, increased awareness does not necessarily translate into health-seeking action; rather, it may heighten anxiety surrounding disclosure, diagnosis, and care.

Normative constructions of masculinity further reinforce this silence. In a patriarchal context where self-control, resilience, and emotional restraint are valorized, seeking sexual health services may be perceived as a threat to masculine identity [23]. Empirical evidence consistently demonstrates that men lack both the vocabulary and socially sanctioned spaces to discuss sexual health concerns, contributing to delayed diagnosis and treatment [27]. Importantly, these dynamics are not confined to interpersonal interactions. They are institutionalized through weak surveillance systems, chronic underreporting, and inconsistent public messaging, which collectively obscure the scale of STI prevalence and reinforce the perception that such infections are exceptional rather than systemic [45].

Taken together, these dynamics explain why stigma persists despite increased awareness. Stigma functions not merely as an attitudinal barrier but as a culturally embedded, morally reinforced, and institutionally reproduced phenomenon, limiting the effectiveness of information-based interventions.

Why men remain invisible in STI policy

A central finding of this review is the persistent invisibility of men within STI policy and programming, despite their critical role in transmission dynamics and prevention efforts. Sexual and reproductive health in Pakistan continues to be framed largely as a women-centered domain, reflecting gendered assumptions within public health that inadvertently marginalize men [5]. While women-focused interventions remain essential, this framing has resulted in limited attention to men's sexual health

needs, behaviors, and vulnerabilities.

As a consequence, health campaigns rarely address men explicitly, and services seldom provide male-friendly or youth-appropriate entry points for care [47]. This omission represents a significant missed opportunity. University-aged men are not only at risk themselves but also play a formative role in shaping peer norms, relationship dynamics, and help-seeking cultures. When men are excluded from policy design, interventions fail to engage with the gendered pathways through which stigma, misinformation, and silence are reproduced.

The marginalization of men within STI policy further reflects broader institutional discomfort with male sexuality. Cultural anxieties surrounding masculinity and morality render it politically and socially easier to focus on narrowly defined "high-risk" populations than to engage men as a heterogeneous group. As a result, policies frequently address behavioral outcomes without confronting the gender norms that sustain them.

Why digital interventions underperform

The limited impact of digital STI interventions in Pakistan underscores the gap between technological optimism and social reality. While digital platforms are often promoted as neutral tools capable of overcoming stigma and access barriers, the evidence suggests that technology alone cannot resolve problems rooted in culture, power, and inequality [48 - 49]. Digital access does not automatically confer digital health literacy, particularly in contexts characterized by linguistic diversity, uneven educational attainment, and the moral regulation of sexuality [50].

Many digital initiatives prioritize information dissemination over participatory design, limiting their relevance and credibility among young users [6]. In the absence of culturally grounded messaging, online content often fails to resonate with lived experience or address the moral anxieties surrounding sexual health. Unregulated digital environments may instead reproduce stigma and misinformation, reinforcing fear rather than enabling informed and critical engagement [33].

These findings suggest that digital interventions underperform not because of technological limitations, but because they insufficiently account for the social contexts in which information is interpreted and acted upon. Without trust, cultural resonance, and critical health literacy, digital tools remain blunt instruments.

Structural barriers also vary by urban–rural context. Urban populations generally have greater physical access to health facilities, whereas rural populations may face greater distance, transportation constraints, limited-service availability, and poorly functioning facilities. In Pakistan, greater distance from appropriate health facilities is associated with lower healthcare utilization, with these effects more pronounced in rural areas [51]. Evidence from remote rural districts further identifies distance, cost, low awareness, and poorly functioning services as important access barriers [52]. Although these studies do not specifically examine STI services among young men, their findings highlight structural conditions that may shape sexual-health access. Thus, rural settings may impose additional constraints related to service availability, mobility, transportation, and continuity of care.

What an interdisciplinary approach adds

The principal theoretical contribution of this

review lies in demonstrating the necessity of an interdisciplinary approach to STI prevention. Public health provides indispensable tools for surveillance, treatment, and program delivery, yet it cannot, in isolation, explain why individuals disengage from services or resist health messaging. Sociology offers insight into how power relations, stigma, and gender norms structure health behavior and access [53]. Anthropology contributes an understanding of meaning-making processes, illuminating how cultural beliefs, moral frameworks, and historical legacies shape perceptions of illness and care.

Together, these perspectives enable a shift from technically sound but socially detached interventions toward strategies that are culturally intelligible and socially legitimate. In the Pakistani context, this entails integrating digital health initiatives with community engagement, gender-sensitive programming, and institutional reform. It also requires recognizing young men not merely as recipients of information, but as active agents capable of shaping peer norms and contributing to sustainable sexual health promotion.

The findings of this review suggest that limited progress in STI prevention in Pakistan reflects a fundamental mismatch between the social nature of the problem and the predominantly technical orientation of existing interventions. Stigma persists because it is culturally reproduced; men remain marginalized because policy frameworks are gender-selective; digital interventions underperform because they neglect social context; and meaningful change remains elusive in the absence of interdisciplinary integration. Sustainable improvements in STI awareness, prevention, and care will therefore depend on culturally informed, inclusive, and equity-driven strategies that recognise sexual health as a socially embedded process rather than a purely biomedical outcome.

Implications for policy, practice, and research

The findings of this narrative review demonstrate that effective prevention of sexually transmitted infections (STIs) in Pakistan cannot be achieved through biomedical provision or digital expansion alone. Rather, STI prevention must be understood as a socially embedded process shaped by gender norms, cultural values, and structural inequalities. Addressing these interlinked challenges requires coordinated and mutually reinforcing actions across policy, practice, and research domains.

Policy implications

At the policy level, STI strategies must adopt explicitly male-inclusive frameworks that recognize young men as both contributors to risk and essential partners in prevention. Existing policy orientations, which largely prioritize women or narrowly defined high-risk populations, inadvertently marginalize men and fail to address the gendered dynamics that sustain stigma, silence, and delayed care-seeking.

Youth-centered digital health policy is equally critical. Policymakers should move beyond assumptions of access and invest in frameworks that promote meaningful engagement, critical health literacy, and sustained trust among young users. This includes strengthening digital infrastructure, integrating sexual health education into secondary and tertiary education policies, and ensuring continuity between health, education, and youth sectors. Linguistic and cultural adaptation are central to these efforts; policies must prioritize Urdu-

language and locally resonant content that aligns public health objectives with lived social realities.

Practice implications

From a practice perspective, STI prevention initiatives should prioritize co-designed digital interventions developed collaboratively with young people, educators, and community stakeholders. Participatory design enhances relevance, legitimacy, and acceptability, particularly in culturally sensitive domains such as sexual health.

Universities represent a strategically important setting for intervention, given their concentration of digitally connected young men navigating formative social and relational transitions. University-based sexual health initiatives embedded within student services, peer-support structures, or trusted digital platforms can provide safer and more accessible spaces for engagement. Beyond institutional contexts, community- and peer-led models remain essential for challenging stigma and normalizing sexual health discussions, particularly when they draw on culturally meaningful narratives and trusted social actors.

Research implications

The review highlights a clear need for qualitative and participatory research that foregrounds young men's lived experiences of sexual health, stigma, and digital engagement. Such approaches are essential for understanding how sexual health knowledge is interpreted, negotiated, and acted upon within specific sociocultural contexts.

There is also a pressing need for rigorous evaluation of digital STI interventions. Despite growing investment in digital health tools, relatively few studies assess their real-world effectiveness, sustainability, or equity impacts. Future research should therefore examine not only changes in knowledge, but also behavioral outcomes, trust formation, and long-term engagement with care. Particular attention should be directed toward neglected male populations, including married men, rural communities, and those outside formal education systems, who remain underrepresented in both research and intervention design.

Limitations of the review

This narrative review is interpretive in scope and does not seek to provide exhaustive coverage of all available literature. The reliance on English-language sources may have resulted in the exclusion of relevant studies published in Urdu or contained within local grey literature. In addition, while the review integrates evidence from multiple disciplines, it does not formally assess the methodological quality of individual studies. The limited availability of evaluative research on digital sexual health interventions further constrains conclusions regarding program effectiveness.

Conclusion

This review suggests that the continuing burden of sexually transmitted infections in Pakistan stems less from gaps in information or service provision and more from a disconnect between the social realities of sexual health and the technical focus of current interventions. Among young men, risk is shaped by stigma, expectations around masculinity, uneven trust in institutions, and the ways digital information is accessed and interpreted. Digital tools may widen access, but they are unlikely to change behavior in isolation from social and

cultural context. Progress in STI prevention will depend on approaches that recognize sexual health as socially situated and that engage directly with the moral, cultural, and institutional conditions influencing young men's willingness and ability to seek care.

Use of AI

During the preparation of this work the author used Chat GPT AI in order to enhance the language and is usability only. After using this tool, the author reviewed and edited the content as needed and take full responsibility for the content of the published article.

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Conflicts of interest

The authors declare no conflicts of interest.

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