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Minimum Service Package for the integration of female genital schistosomiasis into sexual and reproductive health and rights interventions

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Introduction: Female genital schistosomiasis (FGS) is a manifestation of infection with schistosomes in the female genital area that affects an estimated 56 million women and girls in Africa. If untreated, FGS can result in severe sexual and reproductive health (SRH) complications. However, FGS is largely unrecognized by SRH providers, and there is no programmatic guidance for the integration of FGS and sexual and reproductive health and rights (SRHR) interventions in the way of a Minimum Service Package (MSP). Therefore, as part of a larger implementation study, an MSP was developed to guide program staff and health planners on how to integrate FGS and SRHR interventions in schistosomiasis-endemic countries.

Materials and methods: In collaboration with 35 experts from six sectors related to FGS, we conducted virtual workshops, engaging the participants within various specialties from around the world to identify a foundational framework for the MSP, as well as the integration points and activities for FGS and SRHR interventions. Several drafts of the MSP were developed, reviewed in virtual workshops, peer-reviewed, and then finalized by the participants.

Results: A participatory and consultative process led to the identification of a foundational framework for the integration of FGS and SRHR interventions, as well as the integration points and activities. This included identifying cadres of staff who would be needed to implement the MSP and the settings in which the service provision would take place.

Discussion: Defining an MSP to guide the integration of a minimum package of FGS services in SRHR interventions is a critical step toward ensuring the prevention, screening, diagnosis, and treatment of women and girls in Africa. The MSP can now be rolled out and tested in a country context to start reducing the burden of this preventable and treatable neglected disease.

KEYWORDS

female genital schistosomiasis, sexual and reproductive health and rights, sexual and reproductive health, HIV, cervical cancer, integration

Introduction

Schistosomiasis, also known as bilharzia, is a disease caused by parasites (schistosomes) that live in freshwater in subtropical and tropical regions, where they depend on snail hosts (1). There are two main types of human schistosomiasis found in Sub-Saharan Africa: urogenital schistosomiasis caused by infection with *Schistosoma haematobium* and intestinal schistosomiasis caused by infection with *Schistosoma mansoni* (2). Female genital schistosomiasis (FGS) is a manifestation of a chronic infection with the parasites responsible for urogenital schistosomiasis. FGS has been estimated to affect around 56 million women and girls across Sub-Saharan Africa, where *S. haematobium* is endemic (3, 4). Coastal and rural areas with a high prevalence of *S. haematobium* infection are more heavily affected by FGS due to factors such as the presence of suitable freshwater bodies and poor access to clean water and sanitation facilities (5, 6).

Schistosome cercariae are released from the snails and infect those who come into contact with contaminated water (1). Once in the human body, the parasites develop into adults and travel through the blood vessels to the pelvic area where the female worms release eggs that then migrate, with the aim of being excreted out of the body and continuing their life cycle (1). However, some of the eggs are lodged in body tissues, e.g., in the cervix, uterus, and vagina, where they cause an inflammatory reaction that can result in lesions. This reaction is known as FGS. Symptoms include abnormal vaginal discharge, bloody discharge, genital itching, and painful intercourse (1). If left untreated, FGS can result in anemia and serious sexual and reproductive health (SRH) complications such as contact bleeding, primary and secondary infertility, ectopic pregnancy, miscarriage, and low birth weight (2). Due to its clinical presentation, untreated FGS has the same symptoms as those of a recurring sexually transmitted infection (STI) and is commonly misdiagnosed as such, which contributes to repeat referrals and a failure to treat (7).

Untreated FGS has been associated with prevalent HIV (8–14). Studies have attributed the link between FGS and an increased risk of HIV to, among other factors, mucosal changes in the vaginal epithelium of the cervix and the vagina as a result of FGS, which render the area more vulnerable to HIV (9–11, 15). Some studies have also suggested a link between cervical cancer and FGS, with FGS altering the mucosal gene expression and reducing the human papillomavirus (HPV)- and cancer-protective immune responses in women (2). Further immunological changes may act to attract the HIV virus, thereby increasing the risk of HIV transmission (11, 16, 17). In Africa, there is a strong geographical correlation between areas with *S. haematobium*, HIV, and HPV, suggesting a HIV/HPV/schistosomiasis syndemic (1–3, 7, 18, 19).

FGS is clinically diagnosed through colposcopy or a visual pelvic inspection, similar to that for cervical cancer, to identify lesions that look like sandy patches, yellow patches, rubbery papules, or abnormal blood tissues on the vaginal tissue or the cervix (2, 7). FGS is treatable using a medication called praziquantel, which can also be used as routine preventive chemotherapy for schistosomiasis (7). The prevention and treatment for school-based children is largely done through mass drug administration (MDA), which does not reach all women and girls at risk of schistosomiasis and FGS (7). MDAs are largely delivered through neglected tropical diseases (NTD) programs and are therefore outside of the SRHR programs (7), with the WHO calling for a praziquantel rollout through SRH services in schistosomiasis-endemic areas (20, 21).

Despite its clinical presentation and due to its treatment, prevention, and reach, FGS has historically not been recognized as an SRH condition (3, 22). Moreover, FGS is usually not diagnosed and therefore not treated, due to a lack of awareness of this disease among health workers: it is not part of the national medical curricula in most schistosomiasis-endemic countries, and healthcare workers lack the training required to diagnose and treat FGS (7).

The lack of acknowledgement of FGS and of services to reduce its burden is a human rights issue and needs to be recognized as such (23). FGS is both a disease of inequality and a human rights issue, reflecting a lack of access to clean water, hygiene, and sanitation and access to adequate health services to prevent, diagnose, and treat it (24). The distribution of household chores across many communities in schistosomiasis-endemic areas puts women and girls at disproportionate risk to FGS; hence, FGS needs to be approached with a specific gendered lens (24). Williams et al. (24) highlighted that harmful gender norms play a critical role and that healthcare workers need to be sensitized to this when dealing with clients and FGS. The similarities between the signs and symptoms of FGS and those of some common STIs further contribute to the stigma and discrimination from the wider community (7, 25, 26). Therefore, FGS must be viewed as a human rights and gender equality issue, with its prevalence serving as an indicator of health inequality and addressed within integrated service delivery (23, 24).

FGS thus remains a neglected, misunderstood, understudied, and underreported issue (2, 3, 7, 23, 24); as such, there is currently no integrated programmatic guidance to support the integration of FGS and SRH. The objective of this study was therefore to fill this gap and develop programmatic guidance for FGS integration. The study also aimed to create a Minimum Service Package (MSP) for governments, public health practitioners, specialists, and programmers in schistosomiasis-endemic countries for the integration of FGS into SRHR interventions. The MSP was developed as part of a larger pilot project to integrate FGS into SRHR interventions in three counties across Kenya.

Materials and methods

The development of the MSP was divided into two phases: (i) conceptualization and (ii) consultation. The assumptions for the development of the MSP are described at the end of this section.

Abbreviations: AAAQ, availability, accessibility, acceptability, and quality; ART, anti-retroviral treatment; FGS, female genital schistosomiasis; GBV, gender-based violence; HIV, human immunodeficiency virus; HPV, human papillomavirus; IEC, information, education, and communication; MDA, mass drug administration; MSP, Minimum Service Package; NTD, neglected tropical diseases; PEP, post-exposure prophylaxis; PMTCT, prevention of mother-to-child transmission; PrEP, pre-exposure prophylaxis; SBCC, social and behavior change communication; SRHR, sexual and reproductive health and rights; SRH, sexual and reproductive health; STI, sexually transmitted infection; VIA, visual inspection with acetic acid; VILI, visual inspection with Lugol's iodine; WASH, water, sanitation, and hygiene; WHO, World Health Organization.

Conceptualization of the MSP

The conceptualization phase aimed to ensure the selection of the most suitable guiding frameworks and to gather feedback on the proposed framework, particularly on the FGS/SRH integration points. Four frameworks were identified as the basis for the development of the MSP through an overview review to search for key concepts and words, as well as figures and tables (27). The four frameworks reviewed were: the integration framework developed by Engels et al. (2), the BEST NTD Framework (22), the framework articulated by Vlassoff et al. (23), and the framework by Williams et al. (24). Table 1 shows an overview of the frameworks analyzed as the foundation for the MSP developed in this study. This overview supported the identification of guiding principles for the integration of FGS and SRHR interventions for the MSP, as well as the critical integration points (27).

The framework review supported the identification of the integration points for the MSP, which included health literacy, screening and diagnosis, treatment and care, and social inclusion and equity. The next stage was the consultation of experts on the development of the MSP.

Consultation on the MSP for FGS integration into SRHR programs

The aim of this phase was to secure agreement on the selected FGS/SRH integration points. This was accomplished through two rounds of virtual consultations: i) workshop 1 held on April 26, 2023, and ii) workshop 2 conducted on May 5, 2023.

The workshops aimed to reach a cross-sectoral group of experts, with both workshops conducted online by LP and CK using Microsoft Teams as the geographical diversity among the experts necessitated virtual consultations. The recruitment process was initiated via e-mail, adhering to the principles of purposeful sampling to ensure representation from all six essential sectors for effective FGS service integration: NTDs, FGS, SRH, HIV, WASH (water, sanitation, and hygiene), and cervical cancer. Our recruitment efforts specifically targeted members of the FGS Integration Group and scholars and policymakers with experience or publications related to FGS. A small planning group within the cross-sectoral research team formulated the objectives, the approach, and the proposed outputs for each virtual workshop. These workshops were conducted in English and were facilitated by LP and CK. Following the workshop discussions, the participants actively contributed to and engaged in a peer review of the outcomes produced during each workshop.

Workshop 1

The objective of workshop 1 was to consult a group of experts from six sectors on the framework review for FGS integration and the selected integration points for FGS and SRHR interventions.

The first virtual workshop was held on April 26, 2023, with a duration of 2.5 h. A total of 20 experts from the NTD (n = 7), HIV (n = 5), SRH (n = 2), WASH (n = 1), cervical cancer (n = 2), and FGS (n = 3) sectors attended the first virtual workshop. These experts were geographically spread across West, East, and Southern Africa, Europe, and Northern America. The workshop was divided into seven sessions: 1) an introductory session; 2) introduction of the project; 3) a review of the draft integration frameworks; 4) integration points for FGS and SRH services; 5) task for group work; 6) group work; and 7) feedback from group work and way forward. To focus the workshop and to obtain more detailed feedback, group work was designed to go through two integration points per group. Each group had to address the following discussion points: what is missing, key concerns/challenges, and additions. A final discussion session was held to agree on what was discussed around the integration points and to decide on a way forward. The draft was then modified according to the expert comments gathered from workshop 1.

As part of the workshop 1 process, LP and CK convened a workshop with three SRH and HIV partners in Africa that work on FGS, which included four experts from Nigeria (n = 2), Malawi (n = 1), and Uganda (n = 1). The experts' comments and revisions were discussed and factored into the new draft. If a comment or a suggested revision was not clear, a time was set for the experts to discuss and understand the points further.

The new draft was then shared with the group of experts who were part of both consultative workshops and with an additional 14 experts from the six sectors across the world. Comments were received and the draft was again reviewed accordingly.

Workshop 2

The objective of workshop 2 was to review the final draft of the MSP, including the revised framework and the integration points for FGS and SRH, with the goal of finalizing the MSP as an expert group. This final virtual interactive workshop was held on May 5, 2023, for a period of 2 h. A total of 12 experts from the NTD (n = 4), HIV (n = 4), SRH (n = 1), WASH (n = 1), cervical cancer (n = 1), and FGS (n = 1) sectors spread across West, East, and Southern Africa, North America, and Europe attended the final virtual workshop. The workshop was split into four sections: introduction and the process followed thus far; presentation of the proposed final framework and MSP; specific comments/concerns flagged in the expert peer review; and discussion. The experts were given the opportunity to highlight assumptions and elements to note for the implementation of the MSP, which are outlined in this paper. The comments collected in the final workshop were then factored into the drafts of the MSP before its finalization. The draft was concluded and is ready to be tested in a country context; however, during development, various assumptions were discussed as essential for the successful implementation of the MSP, which are outlined below.

Essential assumptions for the successful implementation of the MSP

The development of the MSP was done using a patient-centered perspective for programmatic services, which used patient/user experiences and perspectives (28) to ensure that the user's journey is clear. Developing the MSP based on a patient-centered perspective also ensures that it is principle-driven, putting the needs and rights of the patients at the core of service delivery (28).

TABLE 1 Overview of the frameworks serving as the foundation for the development of the Minimum Service Package (MSP).

Framework	Integration of FGS	Application to the MSP
Engels et al. (2): The integration of FGS, HIV, and cervical cancer	• This framework speaks to the mounting evidence related to the interaction of FGS, HIV, and HPV/cervical cancer, stating that an integrated approach to these diseases would be effective in preventing infection and disease progression. • There is a similarity in the diagnostic procedures for cervical cancer and FGS, with existing evidence on the benefits of the integration of cervical cancer and HIV services, as well as the links between social risk factors and social consequences for all three conditions. The integration of FGS, HIV, and cervical cancer is therefore feasible and ethical. • Engels' framework focuses on the integration of FGS, HIV, and cervical cancer prevention services. There is proven pre-exposure prophylaxis for HIV, cervical cancer has the preventive HPV vaccine, and praziquantel serves as a preventive treatment for FGS. Through the integration of these proven preventive measures, it would be possible to reach women and girls through existing programmatic interventions in an integrated approach. • The framework speaks to how it is only logical and practical to break down the disease-specific approaches and aim for their integration. • The benefits of this integration include cost and time effectiveness, disease control, and ethical conduct. • By getting praziquantel to women and girls out of school through this integration, the burden of FGS, HIV, and cervical cancer will be reduced.	• The framework of Engels et al. (2) provided guidance on the integration points used in the MSP for the prevention of FGS, HIV, and cervical cancer. • The framework also stipulates that the integration of FGS with cervical cancer and HIV services could indeed be on treatment as well. As cervical cancer and other SRH services are often integrated due to the similarity of the screening and diagnostic procedures, this framework provided guidance on the integration points for screening and diagnosis in the development of the MSP. • The framework also provided guidance for elements related to the social risks and consequences of all three conditions, demonstrating the ethical imperative for integration, highlighting the need for social activities in the MSP. • The framework underscores the importance of addressing all diseases at once, and as each disease has a targeted and proven preventive measure, they can easily be integrated, enabling one to reach women and girls through existing programmatic interventions in an integrated approach. • This further emphasized the importance of the MSP and the integration of FGS and SRHR interventions as the framework highlighted that the benefits of integration include cost and time effectiveness, disease control, and ethical conduct.
BEST NTD Framework (22)	The BEST NTD Framework demonstrates the importance of addressing NTDs through a multi-sectoral approach in order to maximize impact. It highlights the importance of a joint framework to improve the integration and collaboration across different programs and sectors. The BEST Framework also highlights the importance of moving the NTD sector away from a narrow disease control and treatment approach, as well as the importance of strengthening NTD systems as part of larger work toward universal health coverage. The BEST Framework encourages integration with other sectors to counter the problem of NTDs. The BEST Framework (22) covers the following four areas: • *Behavior* as a key element to tackling NTDs, which includes tackling individual physical behavior in communities; attitudes and misconceptions about NTDs; and institutional behavior (ensuring integration and multi-sectoral collaboration). • *Social inclusion* speaks to ensuring universal health coverage and that the most at-risk populations for NTDs are reached, empowered, and supported. Through this inclusion, communities are empowered about NTDs and can employ risk reduction for their health and wellbeing. Addressing stigma and discrimination against people affected by NTDs is also a key element of social inclusion. • *Environmental* measures for NTD control are integral for programs. This includes ensuring that there is infrastructure addressing environmental sanitation and safe and reliable access to clean water. Environmental disease control must include integrated vector management, including veterinary public health services. • *Treatment* is the last area of the BEST Framework, with comprehensive treatment being a core service in addressing NTDs. As we move toward universal health coverage, it means strengthening systems to provide comprehensive treatment and preventive chemotherapy. Disease management and self-care are essential to reducing the severity of these diseases. Also highlighted is the importance of a functional disease surveillance system to ensure that data are monitored and used to strengthen the health system responses.	• The BEST NTD Framework (22) provided guidance on the integration points for the integration of FGS and SRHR interventions, such as factoring in individual behavior in prevention and health literacy activities. • The pillar of the framework on social inclusion and environment informed the development of the MSP through interventions on social inclusion and social consequences, such as stigma and discrimination, and the need for FGS integration to include engagement with other actors working on sanitation and clean water facilities—as clean water is a large determinant for FGS, and only in working in collaboration with other sectors will FGS be addressed. • The BEST Framework highlighted the integration point of treatment and care, which highlights the importance of treatment and preventive chemotherapy core services required to address FGS.
Vlassoff et al. (23): Improving the response of health systems to female genital schistosomiasis in endemic countries through a gender-sensitive human	• This framework speaks to the obligations of governments as defined in international human rights, health and development goals, policies, and frameworks such as the WHO in 1946 and reiterated in the Universal Declaration of Human Rights of the United Nations in 1948. The human rights-based approach to health has also been accepted as the important ethical benchmark for all health and development initiatives. The Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) prohibits discrimination based on sex—for all services. • It highlights that, as per these guidelines and framework, all people should be guaranteed the right to enjoy the highest attainable standard of physical	• The human rights framework of Vlassoff et al. (23) provided guidance on the integration of FGS with SRHR interventions for the MSP by highlighting the importance of the integration of services through the government health system, as governments have the ultimate responsibility for the realization/fulfillment of human rights and should provide AAAQ health services that cover all health needs. • Therefore, the MSP needed to be grounded in human rights approaches and guide the integration of FGS in the governmental health system, fulfilling the international

(Continued)

TABLE 1 Continued

Framework	Integration of FGS	Application to the MSP
rights-based framework	and mental health. • The framework for addressing FGS should be grounded in the international legal system, which stipulates that governments have the main responsibility for respecting, protecting, and fulfilling human rights, including the right to health. • This framework is premised on four benchmarks of the right to health: availability, accessibility, acceptability, and quality (AAAQ). This ensures that services for FGS are available, accessible by those who need them, acceptable to them, and of a high quality. Also, that there should be services provided at sufficient quantity for the need. • The framework also speaks to how the core obligations of the health sector should result in the patient receiving services, based on this framework to address FGS, that are non-discriminatory and provided in an informed and enabling environment. • The framework concludes by highlighting the urgent need to address FGS in an integrated and human rights-based approach and outlines numerous questions that should be considered when trying to strengthen the health system to address FGS.	obligation for governments to provide quality FGS information and AAAQ services.
Williams et al. (24): Human rights as a framework for eliminating female genital schistosomiasis	• This framework also highlights the importance of upholding the human rights principles of AAAQ when providing health services. • This framework goes into detail about how addressing FGS goes beyond providing health services, but also needs to intersect with the provision of clean water and sanitation services, as the persistence of schistosomiasis is a direct consequence of the inability to meet human rights obligations and provide clean water and sanitation. Therefore, addressing FGS needs to include addressing these issues in communities. • Furthermore, this framework specifically highlights the fact that women and girls hold disproportionate risk of FGS due to gendered roles and the unequal share of chores in the household. It therefore highlights that FGS has to be addressed with a gendered lens, ensuring equality and non-discrimination, participation, and accountability. • This framework also speaks to key tasks that need to be undertaken to address FGS, which include the training of healthcare professionals on how to screen, diagnose, and treat FGS; ensuring that control efforts understand and address unequal and harmful gender norms; strengthening efforts to provide clean water and sanitation in these communities and close the knowledge gaps on FGS.	• The human rights framework of Williams et al. (24) informed the MSP around the inclusion of prevention health literacy as an integration point for FGS—as the intersection with clean water and sanitation cannot be ignored and needs to be addressed, alongside risk reduction for the prevention of schistosomiasis. • Moreover, this framework highlighted the importance of ensuring that the MSP is developed with a gendered lens, with the unequal gender roles and harmful gender norms placing women and girls at disproportionate risk of FGS, which needs to be acknowledged during prevention efforts and community engagement. Only through applying a gendered lens to the MSP can we ensure equality and non-discrimination, participation, and accountability.

FGS, female genital schistosomiasis; HPV, human papillomavirus; NTDs, neglected tropical diseases.

As the MSP was developed with a patient-centered perspective, no elements related to the training of staff were included. It was assumed that staff implementing the MSP would be trained regarding FGS, applicable to their cadre, as per the training competencies to ensure successful implementation (7, 25, 26). Another requirement is that staff implementing the MSP must be sensitized and trained in providing youth-friendly, gender-sensitive, and non-judgmental services to ensure social inclusion and equity. All healthcare workers must also understand the association between FGS and gender-based violence. The need to include gender-based violence and social inclusion and equity activities in the implementation of FGS services was well laid out in the frameworks of Vlassoff et al. (23) and Williams et al. (24), as well as in the BEST NTD Framework (22). It was also assumed that all healthcare workers practice the patient feedback protocol, whereby the patient is provided with feedback on the diagnosis, treatment, and referrals for FGS, with a mechanism for the patient to provide feedback in return. Moreover, it is integral that a culture of quality improvement in the provision of integrated FGS services is embedded.

The applicable recording and documentation of FGS cases is also a requirement after FGS diagnosis, which adds scientific evidence on the burden of FGS. Therefore, the implementation of the MSP should be done in partnership with government and public health facilities, and discussions on the documentation of FGS diagnosis and burden need to take place with the relevant government organizations. This is because, without documentation of FGS, the government would not procure praziquantel, which is required for prevention and treatment, nor would it see the need for resourcing for FGS service provision. As such, the MSP does not include guidance on how implementation is monitored and evaluated or how data on FGS cases are collected and communicated as part of national and sub-national health management information systems.

A critical element for the ethical implementation of the MSP is the availability of praziquantel in all facilities implementing the MSP and in schools where MDAs are implemented. Engels et al. (2) and Jacobson et al. (7) highlighted the need for access to praziquantel when providing FGS services. Should praziquantel not be available from the government in programs implementing the MSP, it should be

procured and reported to the NTD department of the Ministry of Health for the required reporting of praziquantel distribution to the WHO.

Although women and girls have a higher disproportionate risk of FGS, the MSP was purposefully developed to be gender-neutral in order to include individuals who identify as transgender, intersex, and gender non-binary, as well as gender-nonconforming individuals, ensuring that any person with a female reproductive organ that can be affected by FGS is able to receive services (24). The MSP is specifically worded in a gender-neutral way to ensure that no one is left behind; however, FGS should also be viewed with a gendered lens due to the disproportionate risk that women and girls face, as highlighted by Vlassoff et al. (23) and Williams et al. (24). To ensure social inclusion and equity, there needs to be ongoing advocacy for resources so that equipment, medication, and the training of healthcare workers are prioritized and that the integration of FGS is sustainable (2, 22–24). The MSP does not highlight a specific role for women and girls; rather, it is assumed that women can be agents of change through delivering different elements of the MSP, depending on their position in the community and health facility. Adolescent girls and young women could implement the health literacy component, as peer educators or community healthcare workers. It is, however, acknowledged that this will be contextual.

As clinical guidance already exists in the WHO FGS Pocket Atlas (29), the MSP does not provide any guidance for the clinical diagnosis and treatment of FGS, but signposts to relevant materials on this topic. Moreover, the MSP does not assume that praziquantel cures FGS. It is acknowledged that praziquantel kills the worms, decreases the inflammation caused by schistosomiasis, and allows the body to heal uncalcified lesions, but it is not a curative medication for FGS and the complications that may have ensued due to FGS (15, 29). The MSP also acknowledges and references that community- and school-based MDAs remain an important prevention point for FGS among young women and girls (7).

Most importantly, for the MSP to be successfully implemented, program managers will need to ensure that stakeholders understand that a quality and comprehensive package of SRH services needs to include FGS in schistosomiasis-endemic areas, thereby recognizing FGS as an SRH condition (30).

Results

FGS adapted framework

Following the overview review of the frameworks, an adapted framework was selected for the integration of FGS and SRHR interventions, which was based on an existing framework detailing the integration of FGS, HIV, and cervical cancer (2). The selected adapted version of this framework (Figure 1) emphasizes human rights principles for addressing FGS: equality and non-discrimination, participation, and accountability (31). In addition, the adapted framework (Figure 1) included assumptions for the successful implementation of FGS and SRHR interventions, such as political commitment and financing for FGS integration, viewing FGS with a gendered lens, recognizing FGS as an SRH issue, and generating scientific evidence to fill knowledge gaps (31).

Minimum Service Package

Through a participatory process, the project team identified four service points for the integration of FGS and SRH services: health literacy, screening and diagnosis, treatment and care, and social inclusion and equity (cross-cutting). The MSP indicates

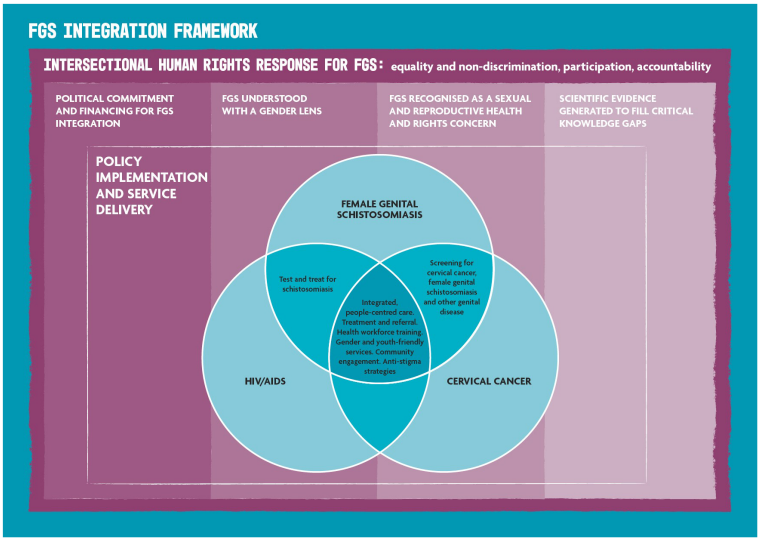

FIGURE 1
Female genital schistosomiasis (FGS) integration framework adapted from Engels et al. (2) and Williams et al. (24).

possible venues for service delivery, but this is not a strict requirement as the setting for the provision of services will be contextual.

Health literacy

The first service integration point identified in the MSP is health literacy on FGS integrated into health literacy activities that take place in SRHR interventions, as shown in Table 2. Health literacy largely takes place in the community setting through the work of peer educators, community healthcare workers, or volunteers to mobilize patients for SRHR interventions. Integrated FGS health literacy activities could also take place in healthcare facilities at all levels—primary, secondary, and tertiary facilities—should the patient not have been reached in the community. The integration of FGS health literacy into SRHR interventions includes health education and social behavior change communication (SBCC)/information, education, and communication (IEC) on the following topics outlined below.

TABLE 2 Integration of female genital schistosomiasis (FGS) health literacy.

FGS service	Integration within SRHR programs
Heath education or SBCC/IEC about schistosomiasis and FGS and their prevention, including avoiding contact with freshwater sources in schistosomiasis-endemic areas and other risk factors	Community healthcare worker/volunteer/peer educator provides information about schistosomiasis and FGS during peer education, program household visits, or through community health outreach in schistosomiasis-endemic areas and surrounding communities. FGS basic information and risk factors incorporated into SRHR, HIV, and cervical cancer SBCC/IEC materials
Health education and counseling or SBCC/IEC on the symptoms of FGS and their overlap with those of STIs and cervical cancer	Community healthcare worker/volunteer/peer educator provides information on the signs and symptoms of FGS, such as vaginal discharge, contact bleeding, and pain during sex, alongside information on STIs, HIV, and cervical cancer health. Acknowledges the possibility of stigma, gender-based violence, and mental health related to all of these conditions, as well as providing information on condom use, post-exposure prophylaxis (PEP)/pre-exposure prophylaxis (PrEP), risk reduction (for HIV, unsafe sex, and FGS), prevention of mother-to-child transmission (PMTCT), pregnancy testing, contraception, and safe abortion during routine household visits (including antenatal and postnatal visits) and community outreach. Information makes it clear that FGS is not an STI, although it presents similarly. FGS incorporated into IEC materials and SBCC on SRHR, HIV, and cervical cancer
Health education or SBCC/IEC about the increased risk of HIV and cervical cancer if exposed to schistosomiasis	Community healthcare worker/volunteer/peer educator provides information about schistosomiasis and FGS and the increased risk of HIV transmission and cervical cancer during demand creation. Acknowledges the possibility of stigma, gender-based violence, and mental health related to FGS, HIV, and cervical cancer. As part of this, also provides information on safer sex, PEP/PrEP, risk reduction and PMTCT, pregnancy testing, contraception, and safe abortion during peer education/routine household visits and community outreach. FGS incorporated into SBCC/IEC materials on SRHR and HIV and cervical cancer
Health education or SBCC/IEC about the increased risk of chronic SRH complications of FGS	Community healthcare worker/volunteer/peer educator provides information about schistosomiasis and FGS and the increased risk of SRH complications due to untreated FGS, including ectopic pregnancy, infertility, and subfertility during peer education/routine household visits and community outreach. Acknowledges the possibility of stigma, gender-based violence, and mental health related to SRH complications and FGS. FGS incorporated into IEC/SBCC materials on SRHR, HIV, and cervical cancer
Health education and SBCC/IEC about praziquantel as treatment and prevention of FGS	Community healthcare worker/volunteer/peer educator provides information on the prevention and treatment of FGS with praziquantel as part of peer education, health information/demand creation for contraception, HIV testing and counseling, pregnancy testing, or during household visits and community MDA. FGS incorporated into IEC/SBCC on SRHR, HIV, and cervical cancer
Health education on the FGS screening process	Community healthcare worker/volunteer/peer educator provides information on the procedures to screen and diagnose FGS, such as the procedures involving a speculum and colposcope.

SBCC, social behavior change communication; IEC, information, education, and communication; STI, sexually transmitted infections; SRHR, sexual and reproductive health and rights.

Screening and diagnosis

The second integration point for FGS identified in the MSP is screening and diagnosis, outlined in Table 3. The screening and diagnosis of FGS, as with other screening and diagnosis services in an SRH program, takes place in primary, secondary, and tertiary healthcare facilities and performed by a healthcare worker (nurse or doctor). The MSP outlines how FGS screening and diagnosis services can be integrated into SRH services as follows.

It is important to note that the MSP outlines that, for girls who are pre-sexual debut, a pelvic examination is not appropriate; therefore, a risk assessment and verbal screening are instead performed, with praziquantel provided presumptively as part of the treatment and care services. No colposcopy or pelvic examination can be completed, thereby not allowing diagnosis.

Treatment and care

The third integration point concerns FGS treatment and care, as outlined in Table 4. The treatment and care services for FGS can be

TABLE 3 Integration of female genital schistosomiasis (FGS) screening and diagnosis.

FGS service	Integration within SRHR programs
Health literacy about and risk assessment for schistosomiasis and FGS	FGS to be integrated into SRH discussion and service provision. Healthcare worker ensures that the patient understands schistosomiasis and FGS prior to offering FGS clinical services. This includes information on schistosomiasis and FGS, the signs and symptoms of FGS, risk of HIV and cervical cancer transmission due to schistosomiasis/FGS, and SRH complications due to untreated FGS, as well as prevention and treatment with praziquantel. Healthcare worker assesses the risk of schistosomiasis infection, including questions about routine activities that lead to freshwater contact in schistosomiasis-endemic areas and other risk behaviors. Healthcare worker asks for consent to do a verbal screening for FGS. Before screening, healthcare worker explains how screening and diagnosis work for FGS, including the procedure using a speculum/colposcope.
Verbal screening for schistosomiasis and FGS	During routine SRH screenings, the healthcare worker incorporates FGS with a verbal screening, which includes questions around SRH and information on the risks of HIV, HPV, and cervical cancer at the clinical facilities. Questions regarding any previous history of urinary schistosomiasis, symptoms of FGS such as vaginal discharge, contact bleeding, and infertility, or a history of STIs not responding to treatment are asked in a gender- and culture-sensitive manner. This is done with counseling and referral, if required. Acknowledges the possibility of stigma, gender-based violence, and mental health related to SRH complications and FGS.
Pelvic examination	A pelvic examination can be done in a community-level healthcare setting and in all levels of health facilities. As part of SRH service provision, FGS is incorporated into pelvic examinations for cervical cancer or other conditions. Healthcare worker performs a pelvic exam with a colposcope or speculum to inspect the vagina and cervix for any sandy patches, abnormal blood vessels, rubbery papules, and lesions and to assess the color, size, and shape and then manages or makes referrals for treatment complications of FGS as per the WHO guidelines (29). Identifies the presence of discharge/history of discharge—smell and color—and treatment for STIs according to local algorithms/management. This would be alongside cervical cancer screenings that take place during HIV testing and counseling. The healthcare worker would do this with sensitivity, being aware of any mental health concerns for the patient due to an FGS diagnosis and also acknowledging the possibility of stigma and gender-based violence. Referrals for support to be completed if and when needed.
Visual inspection with acetic acid (VIA)/visual inspection with Lugol's iodine (VILI) or Pap smear	The VIA and VILI procedures can be done at the primary-level healthcare facility or a hospital. Incorporating FGS into SRH services will include the healthcare worker performing the VIA/VILI procedure and reporting local changes in the appearance of the lesions. Lesions that are not shiny white (presentation of cervical cancer) and outside of the transformation zone increase suspicion of FGS. Routine care and diagnosis of FGS should NOT be based on cervical biopsy as this also affects the cervical mucosa and causes inflammation, possibly increasing the risk of HIV transmission. Clinical appearance is sufficient. Biopsy should only be performed to rule out cervical cancer. The healthcare worker would do this with sensitivity and be aware of any mental health concerns for the patient due to an FGS diagnosis, also acknowledging the possibility of stigma and gender-based violence.

SRH, sexual and reproductive health; SRHR, sexual and reproductive health and rights; HPV, human papillomavirus.

incorporated into the delivery of SRH services for the treatment of SRH conditions. These can be provided by a healthcare worker (doctor and nurse) at all levels of healthcare facilities and in the community, such as during MDA. The MSP outlines how the following FGS treatment and care services can be integrated into SRH services.

Girls who are pre-sexual debut and for whom no diagnosis could be completed should be provided with praziquantel as treatment, should the screening identify the possibility of FGS, or as prevention.

Social inclusion and equity

The final integration point relates to advocacy and to addressing the structural barriers that exacerbate the burden of FGS, as

TABLE 4 Integration of female genital schistosomiasis (FGS) treatment and care.

FGS service	Integration within SRHR programs
Administration of praziquantel as prevention/ treatment	Healthcare worker provides treatment (praziquantel) or refers the patient for access to praziquantel outside of the MDA. Healthcare worker prescribes (and presumptively prescribes) or administers 40 mg/kg of praziquantel as a single dose based on height or weight dosing according to local guidelines to those identified as at risk through screening or diagnosed with FGS at the same time as providing treatment and care, for instance provision or referral for ART or cervical cancer treatment. Praziquantel also provided as prevention/treatment during HPV vaccination drives in schools and in other settings Repeats treatment if the risk factors persist and makes referrals for other SRH complications related to FGS diagnosis, such high-risk pregnancy During SRH service delivery, administration of prevention/ treatment should be done in conjunction with counseling, along with information on the increased risks of HIV and cervical cancer. The healthcare worker would also be sensitive to mental health concerns due to a positive FGS diagnosis, while also acknowledging the possibility of stigma and gender-based violence.
Syndromic management of FGS	During consultations for HIV, SRHR, and cervical cancer, the syndromic management of FGS can be undertaken alongside that of SRHR, such as for STIs or cervical cancer. A diagnosis of FGS should be considered in women and girls with urogenital symptoms and a history of contact with

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TABLE 4 Continued

FGS service	Integration within SRHR programs
	freshwater bodies in schistosomiasis-endemic countries. The syndromic diagnosis of FGS is based on the following: • Water contact at any time in their lifetime in an endemic area AND • Abnormal discharge • Bloody discharge • Primary infertility • Burning sensation in the genitals • Secondary infertility There are no official syndromic treatment guidelines for FGS, but a prerogative recommendation included in the syndromic management from STIs: "The Pocket Atlas also allows inclusion of the disease in guidelines and training modules for the syndromic management of sexually transmitted infections and encourages parallel screening for HIV, sexually transmitted infections, and cervical cancer" (29). Syndromic management of FGS done in conjunction with counseling on the diagnosis and treatment of FGS and the increased risks of HIV and cervical cancer during SRH service delivery. Referrals for support to be completed when and if needed, as well as being sensitive to mental health concerns, stigma, and gender-based violence.
Posttreatment care and follow-up	In the case of positive diagnosis of FGS, the healthcare worker provides patients with a date to return to the clinic for a posttreatment follow-up to check the infection status and symptoms and for praziquantel. The healthcare worker should also be aware of any mental health concerns in the patient due to the FGS diagnosis, gender-based violence, and stigma. Referrals for support to be completed if and when needed.

SRH, sexual and reproductive health; MDA, mass drug administration; ART, anti-retroviral treatment; SRHR, sexual and reproductive health and rights; HPV, human papillomavirus; STIs, sexually transmitted infections.

displayed in Table 5. These include barriers to the access of FGS services, risk reduction of exposure to contaminated water, barriers to the access of praziquantel, and activities to reduce the risk of and address gender-based violence. They sit under a cross-cutting component called social inclusion and equity. This integration point cuts across all SRHR interventions and would take place in community settings and at all levels of healthcare. This integration point includes all cadres of staff in an SRH program. The following activities are included.

TABLE 5 Female genital schistosomiasis (FGS) social inclusion and equity.

FGS service	Integration within SRHR programs
Addressing barriers to the access of FGS services	Integrating advocacy for reducing the barriers to FGS services into SRHR interventions is an integral step to reducing the burden of FGS among women and girls. Program staff, including community healthcare workers/peer educators and clinical healthcare workers, identifies communities that do not have access to and do not benefit from MDAs. This may include school-aged children who are not in school, adults at risk (specifically women and adolescent girls who come into contact with infected water), and marginalized individuals (e.g., people living with disabilities, sex workers, refugees, migrants, and indigenous groups, among others). Identify at-risk populations for services and provide health education. Partnering with SRHR and HIV programs is integral for reaching these marginalized and key populations.
Identifying risk of gender-based violence and mental health concerns	During FGS, HIV, and SRH service provision, all cadres of staff identify risk of gender-based violence or mental health concerns and make referrals for counseling/legal support where this is available. This is also a consideration for all women identifying or presenting with STI symptoms.
Advocacy for access to FGS screening, diagnosis, treatment and prevention commodities, medication, equipment, training, and budget	Advocacy for access to FGS services is integral to reducing its burden. Advocacy for FGS to be integrated into the ongoing advocacy for SRH, cervical cancer and HIV services, budget, medication, training, and resources. As FGS is a risk factor for HIV, SRH complications, and cervical cancer, it must be integrated into that advocacy.
Risk reduction counseling for exposure to contaminated water	In schistosomiasis-endemic areas, as part of SRH services, integrate risk reduction counseling to decrease exposure to contaminated water sources. As the risk of FGS is largely due to gendered home roles, this counseling can include discussions about the division of labor, accessing different water sources, making water safer for use, and referrals for gender-based violence.

MDA, mass drug administration; SRH, sexual and reproductive health; SRHR, sexual and reproductive health and rights; STI, sexually transmitted infection.

Discussion

FGS is a debilitating SRH condition that affects millions of women and girls across Africa and is associated with SRH issues, including infertility and subfertility. Current interventions focus on MDAs for the distribution of praziquantel, the drug used to prevent and treat schistosomiasis and, therefore, prevent FGS (7). In order to rapidly scale-up the reach and effectiveness, it is important that FGS services are integrated into health services (7). Preston et al. (32) have reiterated the importance of the early prevention and availability of praziquantel in schistosomiasis-endemic countries, such as Cote d'Ivoire. For this to happen, program staff, health planners, and government officials need to be able to address FGS through SRHR interventions and to recognize it as an SRH condition (30). The MSP addresses this problem by providing guidance to health managers, programmers and planners, and SRH service providers on the minimum package of FGS services that can be integrated into ongoing SRHR interventions at the community and health facility levels.

The MSP was developed based on the assumption that the integration of FGS into SRHR interventions is possible, feasible, and realistic. The reasons for this assumption are as follows: the populations affected, the similarities in the signs and symptoms of FGS and STIs, as well as the screening and diagnosis for FGS and other SRH conditions, and the stigma and discrimination associated with HIV and FGS due to a poor understanding of FGS and its link to infertility (2, 30). Existing frameworks (2, 22–24) were reviewed, gaps were identified, and a new adapted framework was developed

(31), which informed the MSP. A participatory and multidisciplinary approach was used for both the adapted framework and the MSP. The adapted model extends beyond a clinical service delivery framework, recognizing person-centered and human rights approaches and the need for a gendered response (23, 24). This rationale and paradigm shift aligned with the findings of studies calling for FGS integration. Scholars have urged policy makers i) to view the issue of FGS neglect with a human rights lens and ii) to include FGS as a critical SRH condition in SRHR normative guidance for policy making, budgetary processes, and service delivery at the country level (3, 21, 24, 30, 33–36).

The MSP is therefore informed by human rights principles encompassing equality, non-discrimination, participation, and accountability (23, 24). It speaks to the importance of addressing structural barriers such as access to water and sanitation; the empowerment and involvement of communities and stigma (22); and the need for advocacy efforts for resourcing, strategies, medication, and training to alleviate the burden of FGS (23, 24). It also emphasizes an ethical imperative for comprehensive integrated SRH services (2, 22, 30, 32).

The four integration points identified in the MSP (i.e., health literacy, screening and diagnosis, treatment and care, and social inclusion and equity) provide concrete guidance to program staff on the incorporation of FGS into routine SRHR programs, ensuring that a patient's journey and needs were central to its development. The MSP enables program staff, health planners, and government officials to address FGS through SRHR interventions and to recognize it as an SRH condition (30).

There are a number of limitations to the MSP. In terms of the participatory process used for its development, it was developed over a short time period due to the project in which it is placed. The consultation process could have been more comprehensive, with more consultations held to ensure maximum participation over a longer time period and with greater representation of experts from schistosomiasis-endemic countries. With more time, additional sectors could also have been identified for consultation.

The prerequisites for the implementation of the MSP constitute another limitation, as noted in Essential assumptions for the successful implementation of the MSP. The absence of these factors would limit the successful implementation of the MSP or may even hinder its implementation. Firstly, the MSP purposefully excludes clinical guidelines or training materials on FGS. Rather, the MSP references existing resources, including the FGS training competencies (7) and the WHO FGS World Pocket Atlas (29). Despite the lack of clinical guidelines in the MSP, we also acknowledge that there are existing questions regarding the diagnosis of FGS without relying on colposcopy. Although the easiest route of integration is through cervical cancer screening, as pelvic examination will already be taking place, the MSP outlines that, in schistosomiasis-endemic areas, it is ethical to use additional entry points for the integration of FGS (2). In addition, integrated FGS services need to be client-centered, with the applicable quality assurance processes in place, as is expected in the provision of any healthcare service (7), however, the MSP does not provide guidance on these quality assurance processes. An extremely important prerequisite is that praziquantel must be available in health facilities for prevention and treatment (32). This is due to the fact that, in most countries, praziquantel is largely only available through MDAs (2, 7). This is, in itself, partly dependent on the effective ownership and rollout of the MSP, which is designed to generate demand for praziquantel through increasing awareness, screening, and referrals and through capturing FGS data.

The FGS and SRHR integration and the uptake of the MSP also require that FGS is recognized as a neglected SRH issue, that research is undertaken to address evidence gaps, and that political commitment is secured not least to release financial and other resources (2, 3, 7, 23–25). Advocacy is necessary to support this broader environment for the uptake and rollout of the MSP. A demonstration project will assess the MSP through examining the feasibility, acceptability and the cost of using this model for the integration of FGS into the SRHR interventions in the Homa Bay, Kilifi, and Kwale counties of Kenya. This pilot will support the adoption and implementation of the MSP in other countries. Multi-context implementation is recommended to support learning and further adaptation in order to provide a tested and costed model for the integration of FGS and SRHR for health planners, programmers, and service providers.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

LP: Conceptualization, Methodology, Writing – original draft. IU-W: Methodology, Writing – review & editing. DS: Writing – review & editing. CK: Conceptualization, Methodology, Writing – review & editing. RK: Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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