Assessment of community stakeholders' and health educators and professionals needs for the continuous enhancement of sexual and reproductive health and rights within the CLEFS project in Mali: Protocol for a convergent mixed-methods study

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Abstract

Background: In Mali, a lack of qualified human resources (HR) in primary health care (PHC) and sexual and reproductive health and rights (SRHR) is one of the greatest barriers to the population's access to standard health services. Frontline professional trainings require to be strengthened to respond to the needs of the population, particularly those of women and girls. Trainings must be conducted with an interdisciplinary and adapted approach as well as to promote gender equality (GE).

Objective: To identify the SRHR training needs among community, educational actors and primary health care providers.

Methods: Convergent mixed methods research was adopted, using two methods:

(1) A quantitative method, through a cross-sectional analytical survey conducted at the community level with university community health centers (CSCom-U) users and adolescents in CSCom-U health areas, as well as at the health education institution and community health centers (CSCom) levels with teachers, students and interdisciplinary professional groups within the CSCom-U and district hospital maternity. Descriptive and inferential analyses will be conducted to process quantitative data.

(2) A qualitative method, based on three sources of data (focus groups, individual semi-structured interviews, document analysis) and which involved the same targets as the quantitative component, with additional community actors such as Community Health Associations (ASACO) and Women's Service User Communities. A thematic analysis of the qualitative data using a mixed deductive and inductive method will be performed.

Results: This study will provide a better understanding of adolescents and SRHR users services needs in terms of health services availability and quality and SRHR knowledge, issues related to student training quality, the level of adequacy between the training offered and the actual needs of the service recipients and the level of preparation and ability of teachers to provide quality teaching taking gender equality into account.

Conclusions: The recommendations drawn from this assessment will propose concrete actions to improve women and girls'

health services provided by professionals, and to better adapt the future health professionals' profiles to the needs of communities, and more particularly of women and girls.

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Paper type: Original Paper
Keywords: Mixed-methods study; Protocol; Sexual and reproductive health and rights; Mali; Primary health care providers; Women and girls' health needs

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Expected results: This study will provide a better understanding of adolescents and SRHR users services needs in terms of health services availability and quality and SRHR knowledge, issues related to student training quality, the level of adequacy between the training offered and the actual needs of the service recipients and the level of preparation and ability of teachers to provide quality teaching taking gender equality into account. The recommendations drawn from this assessment will propose concrete actions to improve women and girls' health services provided by professionals, and to better adapt the future health professionals' profiles to the needs of communities, and more particularly of women and girls.

Introduction

Background

In Mali, the health system does not yet have sufficient capacity to meet the health needs of the population, especially those of women and girls. Primary health care (PHC), considered to be the foundation of sexual and reproductive health and rights (SRHR) service delivery, remains poor (World Health Organization [WHO], 2012). Each year, 33% of pregnant women give birth outside of a health facility and maternal death

[a] CSCom-U are community health centers with a university orientation that also offer delocalized internships for medical students.
[b] The CSCom are first-level health centers in community settings offering a minimum package of health care.
[c] Note that this research is at the stage of data analysis and interpretation.

ratio is 440/100,000 births (United Nations Population Fund, 2024). Although 24% of Malian women aged between 15-49 years report having unmet family planning (FP) needs, only 15% of them use modern contraceptive methods (Enquête Démographique et de Santé VI Mali, 2018). Among women with unmet FP needs, 17% are oriented toward pregnancy spacing (Enquête Démographique et de Santé VI Mali, 2018).

In rural areas, where approximately 75% of the Malian population live, access to PHC services is more difficult, creating thus substantial inequities. There is a significantly higher fertility rate (6.8 vs. 4.9 in urban areas), a lower proportion of prenatal care visits (37% vs. 67% in urban areas), a higher proportion of deliveries outside a health facility (39% vs. 7% in urban areas), as well as more limited access to FP (contraceptive prevalence rate for sexually active women not in a union is of 27% vs. 44% in urban areas) (Enquête Démographique et de Santé VI Mali, 2018). This highlights that women and girls have poor access to non-stigmatizing SRHR services and information as well as insufficient bargaining power regarding their sexual and reproductive health. In addition, gender-based violence (GBV), including domestic violence, is also widely common as 45% of women aged 15-49 are victims of physical or sexual violence (Enquête Démographique et de Santé VI Mali, 2018). However, this violence remains poorly documented due to several barriers such as low institutional commitment to integrating this issue, particularly in health reporting. There is also a lack of health professionals training and clinical screening tools for mental health problems, particularly for postpartum depression, GBV survivors, and people affected by armed conflict (Lasater et al., 2022).

Health education institutions in Mali lack the human, material, and financial resources to fulfill their role in teaching PHC and SRHR care. The gaps in undergraduate and continuing education contribute to the lack of skilled human resources (HR) in PHC and SRHR, particularly in rural areas. Thus, skills of front-line professionals need to be strengthened at the level of both institutional management and training, to respond to the population needs in an interdisciplinary manner (1), to promote gender equality (GE) (2) and, ultimately, to offer training tailored to the needs of the labour market (3).

To address these concerns, the Canadian consortium – which is composed of *Santé Monde*[d], the *Cégep de Saint Jérôme*[e] and the *Centre interdisciplinaire de développement international en santé* from University of Sherbrooke[f] and funded by Global Affairs Canada[g] - has implemented the Local Teaching Communities for Healthy Women and Girls (*Communautés locales d'enseignement pour les femmes et les filles en santé* in french, or CLEFS) project. This project is operating for a five-year period (2020-2025) in five different regions of Mali (Kayes, Koulikoro, Ségou, Sikasso and the district of Bamako). The CLEFS project was developed in partnership with the Malian Ministries of Health, Higher Education and Women's Promotion and with health training institutions in Mali (Faculty of Medicine and Odontostomatology (FMOS), National Institute for Training in Health Sciences (INFSS) and private schools), women's user committees, persons in charge at Community health associations (*Associations de santé communautaire* (ASACO)) for CSCom-U, as well as the Malian district hospitals to which the CSCom-U are attached. This project is based on the principle that health education institutions in Mali must fully integrate PHC/SRHR concepts into their curricula and pedagogical approaches to fulfill their social responsibility towards women's and girls' needs. This process involves collecting and analyzing data on the unmet needs of the beneficiaries, as well as those related to training and front-line healthcare system actors. In this context, the CLEFS project supported the Malian health training institutions (INFSS and FMOS) in the realization of a participatory evaluation.

[d] For more details about the organization, see the following link: https://santemonde.org/

[e] For more details about the organization, see the following link: https://www.cstj.qc.ca/

[f] For more details about the organization, see the following link: https://www.cidis.ca

[g] For more details about the organization, see the following link: https://www.international.gc.ca/world-monde/funding-financement/index.aspx?lang=eng&_ga=2.26538814.2056083736.1706824741-1451775494.1705503423

Research for the continuous improvement of PHC/SRH training programs

Improving care in SRHR requires going through all the steps of the training engineering process to ensure continuous improvement of healthcare services and related trainings. A key step is the collection and analysis of beneficiaries needs, as well as those of the various actors involved in training and the provision of PHC services (Bastien et al., 2022; Tumwine et al., 2023). This participatory approach allows for a better involvement and ownership of the needs assessment methodology by Malian professionals, as well as a better acceptance and use of the resulting findings. The results will reflect a concerted and consensual identification of SRHR needs and therefore an appropriate definition of the expected output profiles at the level of both undergraduate and continuing education. This research aims to improve the practices of health professionals, and the level of quality of the trainings offered by educational institutions supported by the CLEFS project.

As such, the project team conducted a participatory evaluative study to identify the SRHR needs of the communities served by the CSCom-Us, with a focus on women and girls. These data will be combined with those collected from actors involved in training, in the supply of care, and in the regulation of SRHR services. The study also included educational actors (students and trainers) involved in the supply of care to assess the adequacy between the real needs of the communities and the targeted output profiles in SRHR. The research findings will provide an in-depth understanding of the SRHR training and pedagogical needs of these target groups for future integration of these needs into curricula and training plans.

Overall, this research protocol focuses on identifying the SRHR needs of CSCom-U users and adolescents in CSCom-U health areas at the community level (1), as well as the SRHR training needs of CSCom-U/health practitioners, teachers, and students at the FMOS, the INFSS and its affiliated schools (2).

Methods

Study objectives

The overall aim of this research study is to depict the real and differentiated needs of Malian actors and primary care users related to SRHR in order to improve the training programs and services offered in this area. This translated into the following objectives:

i. To identify the SRHR needs of community actors and beneficiaries (adolescents and CSCom-U users);
ii. To identify the SRHR training needs of students, trainers, and health professionals involved in training in terms of SRHR capacity building;
iii. To improve the curricula of nursing and obstetric practitioners in accordance with the needs of the healthcare professionals and specific needs of the populations served, in particular those of women and girls.

Overall study design

Using a participatory approach, this needs assessment adopts a concurrent mixed-methods research design combining quantitative and qualitative methods (Pluye, 2019). It is based on the convergence of the analytical results performed for each method with all the actors concerned (Bourgeois et al., 2022; Loignon et al., 2018).

Figure 1. Overview of the main stages of the research study

Method 1: Quantitative

Quantitative study design

Cross-sectional surveys were conducted in the five project intervention zones, namely the cercles[h] of Sikasso, Kolokani, Baraouéli, Kayes and Bamako in the regions of Sikasso, Koulikoro, Segou, Kayes and Bamako.

Three levels were considered:

i) community level: targeting CSCom-U users and adolescents in the CSCom-U health areas;

ii) health education institutions level (FMOS and the main INFSS and its regional branch schools (called Annex)) and CSCom-U: targeting teachers, students/trainees as well as groups of interdisciplinary professionals from CSCom-U and the maternity ward of district hospitals supported by the CLEFS project.

Participant inclusion criteria

The study participant inclusion criteria are as follows:

- Female users: women of childbearing age between 15 and 49 years old who have resided in the household during the last 6 months before the survey;
- Male users: male heads of household aged 20 years and older or their legal representative aged 20 years and older who have stayed in the household during the last six months;
- Adolescents: unmarried girls and boys aged 15-19;
- Interdisciplinary professional groups: consist of physicians, clinical supervisors, midwives, obstetric nurses practicing in CSCom-U and district hospitals maternity units for at least six months prior to the survey;
- Teachers: lecturers and supervisors on a temporary or contractual basis in the nursing care and obstetrical care programs at the INFSS or Annex schools and in the Family/Community Medicine programs at the FMOS, who have been teaching for at least one year before the survey;
- Students**:** students in the nursing care/obstetrical care streams of the INFSS and its Annex schools, as well as those of the Specialized Studies Diploma in Family/Community Medicine programs, from the 2nd year of teaching onwards - including trainees - with a proportional distribution between men and women and between the different years of study.

Sample size and techniques

Sample size of the different community targets and intervention zone were calculated separately based on the total number of households in the health areas and the size of the population targeted by the survey. Sample size was, considering the proportion of the phenomenon studied, at 50% and the confidence interval at 95%. (Martínez-Mesa et al., 2014). The choice of 50% value allows us to have a sufficiently large sample to make inferences, regardless of the true value of the phenomenon studied in the real population. It was calculated using Epi Info7 software and was distributed proportionally to the size of the households in the selected villages.

Students and teachers sample size was calculated separately based on the total number of students in the nurse and obstetrical care stream at INFSS and its Annex schools and the

[h] A 'cercle' serves as Mali's secondary administrative division. Mali is comprised of eight regions and one capital district (Bamako), with each region further divided into 49 cercles.

number of Family/Community Medicine and teachers involved in these streams at the two institutions. The calculation was done using the same method and the same software as the community level actors in a separate way for the INFSS, the INFSS Annexes and the FMOS. Thus, the calculated sample size (teachers and students) at the Annex schools' level was proportionally distributed based on the number of teachers and students in the different Annexes.

At the community level

A multistage sampling technique was employed for selecting study participants (stratified random, clusters, simple random).

Stratified random sampling was performed in the villages/sectors of the CSCom-U health catchment areas considered as natural strata (4 per CSCom-U). The lists of villages in the health catchment areas were established by CSCom-U. Strata were randomly drawn considering proportionality in this population by applying the systematic random method with a sampling step calculation. Once these strata randomly drawn, the households within these villages/sectors were grouped into clusters (composed of a maximum of 40 households) using the segmentation method each one. Thus, clusters were randomly selected, and the survey was conducted among the households in these clusters.

Another simple random draw was then conducted within households to select one woman of reproductive age in each household (if there are several) to answer the user survey questions. The head of the household or his\her representative who is 20 years old or older was surveyed to answer questions about users. Adolescents (male/female ((M/F)) meeting the criteria in the selected households, were also surveyed after a random draw if numerous. If the number of households expected to be surveyed was greater than the number of households in the selected cluster, another cluster was randomly selected to complete the total number of samples required for the survey.

At the educational institutions and CSCom-U levels

A simple random draw without replacement was made from a list of all teachers of the Specialized Diploma of Family Medicine/Community Medicine and the INFSS and Annex schools to obtain the required sample size. Another simple random draw without replacement was also carried out based on the list of the students of the cycles and level of teaching concerned to obtain the required sample size. The sample size was segregated by gender/level/profession. Randomly selected students were contacted to participate in the survey after obtaining their consent. If a student refused to participate in the survey, another number was randomly drawn to replace him/her until the total sample size was reached.

For the interdisciplinary focus groups in the CSCom-U and district hospitals, as the number of staff is not large, all physicians, midwives, and nurses with a role in SRHR who were available at the time of the team's visit and who gave their consent to participate were surveyed.

There is a low number of professionals in CSCom-U and maternity care. Therefore, all available and willing physicians, midwives and nurses were solicited for the CSCom-U and district hospitals interdisciplinary professional focus groups.

Quantitative data collection and management

To carry out the data collection, teams of external interviewers and trained supervisors were deployed on site. The interviewers were external individuals with an expertise in conducting surveys and recruited by the project team for the period of the data collection. They were responsible for carrying out the surveys among users, adolescents, and students. Due to the sensitivity of sexual and reproductive health issues, female interviewers conducted the surveys among female respondents and male interviewers among males ones.

Supervisors made up of members of the State's Technical Services and members of the

FMOS, INFSS and Association of Private Health Schools were responsible of verifying the conformity of investigators' work and supporting them when necessary. Their involvement strengthened the process of ownership of the continuous quality improvement (CQI) approach from data collection to the presentation of evaluation results. This approach ensured the transfer of acquired skills to other stakeholders and replicate the CQI process in their respective regions, with little or no outside technical assistance. Supervisors were also responsible for conducting the qualitative component.

The FMOS experts (Mali), in collaboration with the INFSS (Mali) and supported by the CLEFS project team (Canada), developed and customized questionnaires tailored to the various survey targets. These questionnaires were subsequently distributed to all stakeholders involved in the training needs assessment process for review, appropriation, and validation of the tools. Once validated, the tools were created on the Kobocollect platform and then deployed on tablets/smartphones to collect data. This method offers several advantages such as: quickness, error avoidance, obligation to answer all questions (better completeness of data) and reduction of outliers. All data collected on-site were sent daily to the Kobocollect account and extracted in an Excel file to be reviewed during the data collection.
Prior to data collection, a three-day training was conducted for the entire evaluation team. This was followed by a one-day pre-test in an area outside of the project's intervention regions to assess its clarity and comprehensibility and to enable the methodology to be adjusted if needed.
Quantitative data analysis
Since the data were collected with tablets/smartphones, data entry was instantaneous. Data were extracted from the KoboCollect platform in Excel format, then processed, cleaned and finally analyzed using Excel and SPSS 22 softwares.
Data analysis and interpretation are still ongoing. According to our research protocol, we will conduct descriptive analyses, such as examining proportions, averages, and standard deviations, to gain insights into socio-demographic characteristics. This includes examining levels of knowledge, attitudes, practices, and perceptions regarding various aspects of SRHR, specifically family planning, sexuality, sexually transmitted infections (STIs), HIV, prenatal care, childbirth, and gender-based violence. The level of satisfaction and challenges related to the use of CSCom-U will also be analyzed. Access to information for CSCom-U users and adolescents regarding SRHR will also be measured.
The evaluation will also include an assessment of the satisfaction levels of students with the SRHR programs attended, the training environment and internships including safety aspects; students' sense of preparedness to face professional life; level of preparedness of teachers and health professionals to respond to the needs of students and interns and to train students able to respond to community needs.
Several inferential statistics will be used. For example, Chi-2 tests will be used to compare the proportions of the variables of interest and the student’s t-test will be used to compare mean scores. Gender analyses will also be performed to understand gender specificities. The statistical significance level will be set at 5%. Multivariable regression analysis will be conducted afterwards if significant associations are found in bivariate analyses.

Method 2: Qualitative

Qualitative study design
Three groups (i.e., multidisciplinary teams, community stakeholders, teaching teams and students) were targeted for the qualitative component, which was conducted using three sources of data: focus groups, semi-structured individual interviews, and a literature review.

Participant selection and method

Community actors

Community actors mainly included the project's implementation partners, i.e., ASACO members, women's user communities, youth groups and community relays. This phase also reached users, adolescents, traditional birth attendants, traditional therapists and community leaders. Targets were chosen according to a purposive sampling and snowball strategy until data saturation was reached according to the inclusion criteria previously identified in the sample of the quantitative component. To ensure a better representation of this population, we aim to select a variety of profiles in terms of age, gender, number of years in office and as members of different associations.

At the community level, six focus groups were conducted as well as semi-structured interviews per health area as follows:

- A mixed focus group (M/F) with members of each ASACO (8 to 12 people);
- A women's focus group with communities of women users (8 to 12 people);
- A mixed (M/F) focus group with youth groups, provided that heterogeneous youth groups exist in the localities. If not, or depending on cultural realities, homogeneous groups were conducted;
- A mixed focus group (M/F) with community relays of 8 to 12 people;
- A homogeneous focus group with women users of the SRHR services of the CSCom-U;
- A mixed focus group (M/F) with adolescents;
- Individual interviews with a traditional birth attendant/rural maternity officer and/or a traditional therapist per village/area, if available.

CScom-U and district hospital maternity units' multidisciplinary teams

These multidisciplinary teams were composed of medical doctors, midwives and obstetric nurses involved in the SRHR services. CSCom-U and maternity technical staff were not numerous and therefore all of them were involved.

Concerning the data, a mixed (M/F) focus group was organized at each CSCom-U and district hospital maternity unit to explore the following elements: the clinical skills of health professionals, the challenges, and issues they face in providing quality SRHR services to women and girls, their level of ability (training, tools, equipment, etc.) to provide quality SRHR services as well as mental and environmental health issues. Discussions also focused on their ability to provide support and respond to the needs of trainees, including safety issues and harassment.

Educational institutions actors

Two groups of actors were targeted at this level: teachers and students. They were chosen according to a purposive sample strategy and until data saturation was reached, according to the inclusion criteria already identified in the sample of the quantitative component. To ensure a better representativeness of this population, we selected a variety of profiles in terms of gender, seniority, level of study, teaching field, type of teacher (lecturer and supervisors).

- **For the teachers**: Three mixed (M/F) focus groups (1/nursing, 1/obstetrical and 1 family or community medicine specialty diploma) of 8 to 12 teachers were organized. Our objective was to better understand the level of preparation of the teachers in terms of pedagogy, of teaching SRHR, their expectations, the difficulties they face in teaching in the continuous improvement of programs.
- **For students:** a heterogeneous focus group for the nursing stream, a homogeneous focus group for the obstetrical stream and a heterogeneous focus group for the family or community medicine specialty diploma of 8-12 students was organized. Our objective was the following: to identify the main challenges and issues related to the

quality of training, the adequacy between training and the needs of the populations, the training environment, gender-based violence, security aspects and the consideration of their specific needs by teachers. To obtain quality information, students were selected from the 2nd year of training.

Document analysis

In addition to the literature review, a documentary analysis was conducted and covered: the CSCom-U supervision reports, maternal death audits, CSCom-U and district hospitals activity reports, previous evaluation reports, etc. These reports helped to determine the needs already identified by the national or regional level at the the CSCom-U and to understand the underlying problems related to SRHR.

Qualitative data collection and management

Focus groups and individual interviews were conducted using interview guides tailored for each target group. They were developed by the project team in collaboration with key partners from FMOS and INFSS and validated by all stakeholders in the needs assessment process. The guides were inspired and adapted to the context and needs of the project based on existing guides such as the Demographic and Health Survey and covered the main themes explored (e.g., SRHR knowledge, services offered, etc.) according to the actors of each target. The various individual interviews and focus groups were conducted by the survey supervisors, who are the project's supporting partners, i.e., agents of the government's technical services, but also key partners. For the focus groups, a minimum of two people conducted them. One was responsible for facilitating the discussion and the other for managing the recording, taking notes, and making observations of the participants. For individual interviews, one or two people conducted them depending on the number of supervisors, one of them was responsible for asking the questions and the other for taking notes and managing the recording.

At the community level

For the recruitment and data collection, our evaluation team informed ASACOs leaders as well as the Technical Directors of the Center (TDC) of the evaluation process, the date, and the participants to be met. They then informed the other members of the ASACOs, the communities of women users, the youth groups, the community relays and set up a schedule of visits and meetings with the different participants. The different discussion groups were conducted in the ASACO offices. ASACOs, with the support of the evaluation team, made the necessary arrangements to ensure the involvement of the participants and to respect data confidentiality.

Guidebooks were written in French, but were administered in Bambara, onthe most widely spoken national language of Mali. The observer took notes directly in French. Each focus group lasted a maximum of 120 minutes and were recorded after obtaining verbal and/or written consent from the participants. Discussions were fully transcribed as they occur in verbatim form and translated by interpreters when needed.

Individual interviews were conducted with traditherapists, traditional birth attendants, and community leaders and occurred in the villages/areas selected for the quantitative survey. Interviews were held after the ASACO leaders have informed the customary authorities and obtained the free and informed consent of the participants. Interviews lasted 45 to 60 minutes at most. The interviews were conducted in Bambara and verbatims were translated into French.

At CScom-U and district hospital maternity units' levels

The evaluation team informed the TDC and the district medical officer, who in turn informed the technical staff of the objectives of the evaluation, the people to be involved in the process,

and the schedule for the evaluation team's visit. In collaboration with their ASACO, they made the necessary arrangements to encourage the participation of the people concerned as well as confidentiality during the data collection.

At the health education institution level

Under the guidance of the evaluation team, the administration of these institutions informed faculty and students of the evaluation process, objectives, and schedule. Together they organized the recruitment of faculty and students who wished to participate in the interviews. They provided a room for the team to ensure confidentiality of the interviews. At the school level, interviews were conducted directly in French and notes were taken in French. They were also recorded after obtaining participants' consent.

Qualitative data Analysis methods

Data analysis and interpretation are still ongoing. Qualitative data analysis will be conducted using an iterative process and will include the listening of audio recordings, successive readings of French transcriptions, team coding, team analysis and participant validation. The project team will code the interviews using QDA Miner software using a mixed deductive and inductive approach. This iterative method simultaneously makes sense of the data collected based on the state of knowledge, while potentially identifying new meanings. A brief list of initial codes based on the interview guides will serve as a coding grid *a priori*. It will be modified and enriched as the analysis proceeds. Coding will be controlled by a double coding technique performed by a member of the project team and the expert researchers. Parallel and independent coding will be done for the first few four interviews, followed by a comparison of the results. This process will be repeated until a consensus list of initial codes is obtained as well as intercoder fidelity greater than 90% (Miles & Huberman, 2003).

Mixed methods integration

We will integrate qualitative and quantitative data after analysis and interpretation consistent with a mixed-method triangulation design quantitative data validation model. This approach is consistent with guidance on methods that advocates complementing quantitative analyses with in-depth data obtained from focus groups and individual interviews (Creswell & Creswell, 2018; Hesse-Biber, 2010).

Evaluation team training and Formative Research

Prior to the data collection start-up, a five-day training session on the use of the QDA Miner qualitative analysis software was organized for the evaluation team in Mali to strengthen their capacity to analyze qualitative data. This training was facilitated by a consultant supported by the University of Sherbrooke who was also in charge making the software available.

A further three days' training on the KoboCollect software was provided to the evaluation team by the project's monitoring and evaluation technical advisor as required.

Prior to the teams' field deployment, a four-day training session was held for all individuals involved in the needs assessment process. The training was provided by FMOS, INFSS, and the CLEFS project team and focussed on the following:

i. understanding the roles and responsibilities of team members:
   - the interviewer's responsibilities in terms of listening, paying attention, etc.;
   - the pitfalls to be avoided (non-judgmental, non-interrupting, etc.);
   - setting up conditions to ensure data confidentiality;
   - seeking free and informed consent to participation;
   - respecting societal and cultural values.

ii. understanding and translating the different tools to be used:
   - a detailed explanation of the tools to be administered;
   - an exchange to validate the translation of these tools into the national language so

that any questions asked are understood and worded correctly.

iii. Survey methodology, including on-site data collection:
- the process of identifying households and survey targets;
- the process of obtaining participant consent and discussing the ethical aspects of the research process;
- Data collection procedures, including digital data collection (e.g., downloading, filling in and saving forms, and sending final versions).

iv. Managing sensitive cases and difficult situations:
- Training on how the evaluation team should act if respondents confide to us or seek our advice or support;
- Following this three-day theoretical training, a pre-test was organized on the fourth day in a Bamako commune with a dozen people to identify and rectify any errors of understanding and phrasing before the team's deployment in the field.

Ethical considerations

Prior to the teams' deployment, the ASACO's offices informed the local authorities in all villages/neighborhoods of the survey teams' presence. Once on site, the teams visited these authorities to obtain their approval to conduct survey activities in their villages/neighborhoods.

Voluntary and informed consent to participate of all respondents was sought at the beginning of the survey and all individuals were informed of their right to refuse to participate, to withdraw at any time, or to not answer certain questions without any justification or prejudice. If a participant wished to withdraw during or after the research, he or she had to contact the research team responsible whose contact details were provided on the consent form.

Confidentiality and anonymity of data were explained to the respondents. For minors, verbal consent was also requested from parents or guardians. An informed consent form was developed outlining the objectives of the research, the voluntary and non-profit nature of participation, data confidentiality and anonymity and the approximate duration of participation. This form was shared by the collectors and its reading (in Bambara or French, as preferred) was mandatory and they were asked to devote time to explain it to the participants. The supervisors ensured that interviewers complied strictly with these instructions.

This research protocol was approved by the Ethics Committees of the Malian FMOS and University of Sherbrooke. All data are confidential and will be only used to achieve the project's results. They may also be used in written or oral publications if deemed relevant[i].

Strengths and limitations of this study

This research is one of the first to provide an understanding of the needs of adolescent users of SRHR services not only in terms of service availability (1), but also service quality (2) and whether providers take their specific needs into account (3). It is also one of the first studies on SRHR deployed in five regions (Bamako, Kayes, Koulikoro, Ségou, Sikasso) across Mali.

Several strategies were used to ensure the credibility of this research:
- Triangulation of data sources (participants from three community levels, educational

[i]The project has obtained ethical approval from the Comité d'éthique de la recherche - Lettres et sciences humaines of the Université de Sherbrooke (reference number: 2022-3261) and from the FMOS in Mali (reference number: 20231 132 ICE/USTTB).

institutions, CSCom-U and district hospital maternity wards), methods (document, focus groups, interviews with different actors) and researchers (i.e., triangulation of several analytical perspectives) to ensure consistency of the data and analyses;
- Double coding for qualitative analysis;
- Double member checking by sending preliminary results to participants belonging to the three target groups to validate and rectify them if necessary;
- Skeptical peer review by members of the research team who will question methods interpretations, and meanings throughout the process (Miles, Huberman & Saldana, 2020);
- Detailed, rich, and concrete description (Patton, 2002) of the study context to enable readers or research users to judge potential transferability to other contexts, as well as a detailed description of the methodological approach, including the research site and data collection methods;
- Sample diversification to promote a wider application.

However, certain limitations were encountered during data collection. Firstly, the inclusion criteria (15-19 years old and single) made access to adolescents in rural areas difficult. Most girls are already married by this age, and unmarried girls often move to the city to work as domestic workers. In addition, teenagers are rarely at home, choosing instead to go to meeting points or sporting activities. This implies that interviewers had to seek them out in schools or conduct interviews in the evening. On the other hand, the availability of service users also posed a problem, requiring late-evening or late-day appointments. Finally, the complexity of the SRHR subject made the questionnaire lengthy, which led to some complaints, although everyone completed the survey.

Expected results

The needs assessment will help us to better understand the needs of adolescents and users of SRHR services, not only in terms of availability of services, quality of services, and whether providers take their specific needs into account, but also in terms of information and knowledge about SRHR.

Results will also provide a better understanding of the issues related to the quality of training and student supervision, the level of adequacy between the training offer and the real needs of services beneficiaries. It will also enable us to assess the level of preparation and skills of teachers to provide quality teaching while taking gender equality into account.

Recommendations resulting from this evaluation will allow us to recommend concrete actions to health professionals so that they can better address the needs of women and girls and improve output profiles to meet the needs of the community - particularly women and girls.

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Conflicts of Interest

None declared.

Abbreviations

ASACO: Community Health Associations

CLEFS : Local Teaching Communities for Healthy Women and Girls (*Communautés locales*

d'enseignement pour les femmes et les filles en santé)
CQI: Continuous Quality Improvement
CSCom-U: University community health centers
FMOS: Faculty of Medicine and Odontostomatology
FP: Family planning
GBV: Gender-based violence
HIV: Human Immunodeficiency Virus
HR: Human resources
INFSS: National Institute of Health Sciences Training (*Institut National de Formation en Science de la Santé*)
STI: Sexually transmitted infection
TDC: Technical Directors of the Center
PCV: Prenatal care visit
PHC: Primary health care
SRHR: Sexual and reproductive health and rights

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Supplementary Files

Figures

Overview of the main stages of the research study.