



**THE GENDERED SOCIALIZATION OF VERY YOUNG ADOLESCENTS
IN SCHOOLS AND SEXUAL AND REPRODUCTIVE HEALTH IN
URBAN INFORMAL SETTLEMENTS IN NAIROBI COUNTY
BASELINE STUDY REPORT**

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List of abbreviations and acronyms

ACE	Adverse Childhood Experience
APHRC	African Population and Health Research Center
CAPI	Computer-Assisted Personal-Interviewing
CASI	Computer-Assisted Self-Interviewing
COVID-19	Coronavirus Disease
ECDE	Early Childhood Development and Education
FGDs	Focus Group Discussions
GEAS	Global Early Adolescent Study
GEM	Gender Equitable Men
GNA	Gender Norm Attitude
IDRC	International Development Research Centre
NACOSTI	National Commission for Science, Technology and Innovation
NUHDSS	Nairobi Urban Health and Demographic Surveillance System
RHE	Reproductive Health Education
SRH	Sexual and Reproductive Health
STaRS	Starting Right in Schools
VYA	Very Young Adolescents

Executive summary

Background

Gender and more specifically, gendered beliefs, norms and socialization are among the key mechanisms that lead to poor sexual and reproductive health (SRH) outcomes among adults as well as young adolescents. Besides the household environment, which is the primary setting for socialization, a large proportion of very young adolescents (VYAs) in most countries spend most of their time in school environments, making these the most appropriate settings for health promotion geared toward equitable gender norms and positive sexual health behaviors. It is against this backdrop that the study *“Starting right in schools (STaRS): Gendered socialization of very young adolescents in schools and sexual and reproductive health”* was designed.

As a school-based implementation research, this study aimed to identify and assess low-cost interventions that can be implemented in schools to trigger change in social attitudes, practices, and beliefs, thereby instilling positive gender norms among very young adolescents and improving adolescent SRH outcomes. More specifically, the study aimed to provide an understanding of the processes and dynamics of gender socialization in the school environment; examine gender norms and SRH-related behavior, knowledge and attitudes among very young adolescents in schools that serve the urban poor; initiate community dialogue and possibly collaboration on effective evidence-based, low-cost, school-based solutions that challenge gender inequities and negative gender stereotypes; and, promote SRH among very young adolescents.

Data and methods

The approach initially adopted for the study was pre- and post-intervention mixed-methods, involving both quantitative and qualitative data collection. The main target population was primary school learners in grades 5 and 6, majority of whom were aged 10–13 years at baseline (and expected to be aged 11–14 at endline). Additionally, all teachers in the participating schools and a sample of parents were targeted to participate in the study. The study sites consisted of four public primary day schools identified through a school mapping exercise conducted in two urban slums (Korogocho and Viwandani) at the beginning of the study. These slum settlements, with an estimated population of 89,000 individuals as at 2019, are covered by the Nairobi Urban Health and Demographic Surveillance System (NUHDSS), a longitudinal research platform run by APHRC since 2002. Two schools in Viwandani served as the intervention arm and two schools in Korogocho were used as the comparison arm.

This baseline report describes the characteristics of the target population participating in the study. A total of 907 learners (381 in the comparison and 526 in the intervention schools) participated in the quantitative baseline survey along with 86 teachers interviewed (55 and 31 in the

intervention and comparison schools respectively). A significant proportion of the targeted learners were not reached because their parents/guardians did not provide written consent for their participation in the study. For the qualitative component, a total of six focus group discussions (FGDs), each composed of 6–9 parents/guardians, for a total of 44 participants (24 women and 20 men) were conducted in the intervention schools. Furthermore, for the intervention schools, 24 learners (paired up) and 12 teachers participated in Photovoice activities to document perceived gendered behaviors and the barriers and enablers to the development of positive gender norms and SRH. It should be noted that the qualitative component as well as intervention activities only targeted the intervention schools.

Key findings

At least two out of every five (45%) learners in the target classes were born in the study areas and nearly half of the learners were living with only one parent. Slightly more girls than boys were living in households with non-parental people (no parents and no grandparents). About a third of the learners were living in households with both parents and the primary caretaker for majority of them was invariably the mother or stepmother. As such, three out of every four (nearly 75%) learners felt close to their female caregivers, compared to about 50% who felt close to their male caregivers with a higher proportion of boys than girls feeling more connected to their male caregivers.

As expected, majority of the learners spent most of their time in school, which confirms the underlying understanding of schools as an important setting for health promotion, including promotion of equitable gender norms and behaviors. More boys than girls (55% vs 38%) spent time with friends, about three times a week. Over 85% of adolescents aspired to study up to university/college level with no significant differences by sex. However, close to half of the learners had missed at least a day or two of school in the previous month of the academic calendar, with no significant differences in absenteeism by sex. The main reasons for school absenteeism were sickness and lack of school fees.

Regarding media, more boys than girls had access, especially to television, radio, computers and mobile phones. Similarly, more boys (50%) than girls (38%) spent time on media playing computer/video games. In general, more boys than girls accessed SRH content on the internet or social media with significant differences being noted. On average, boys reported higher levels of empowerment across the three domains (freedom of movement, voice and decision-making) with significant differences for the voice and decision-making domains. The results suggest that boys have more freedom to move and make decisions both in school and at home while girls on the other hand, are socialized to be more cautious on where they go and who they associate with.

Turning to gender norms, the results indicate a high endorsement of 'sexual double standards' implying a validation by learners that boys and girls are judged differently relative to the same sexual behavior. Also, there are indications of strong views about specific roles for boys/men and girls/women in the society as well as 'stereotypical views about strength and weakness in romantic relationships' suggesting that physical attributes are considered an important feature in relationships. Boys had a stronger endorsement of the 'stereotypical views', 'premarital sex permissiveness' and 'gender non-conformity' compared to girls. In effect, boys were more likely to endorse the stereotypical views, premarital sex permissiveness, and gender non-conformity although qualitative discussions (with adolescents as well as their parents) suggest that both boys and girls are taught to uphold gender equitable norms.

Majority (nearly 70%) of the learners had been exposed to at least one adverse childhood experience (ACE) with boys more likely than girls to have had this experience. Consequently, more boys than girls were reportedly scared of being physically harmed or killed by their parents or other adults. About 6% of boys reported having been victims of attempted or forced sex compared to 3% of girls. The witnessing of violent situations (victimization and perpetration) was common across the board, with more boys than girls reporting that they had ever witnessed, experienced and/or perpetrated violence. FGDs and Photovoice exercises suggested that girls were more cushioned and often protected from harm in comparison to boys. As such, boys were often left to their own devices, consequently getting exposed to the risk of interpersonal violence and injuries. Discussions with the teachers also indicated that girls were more likely to receive assistance when they had adverse experiences because of the availability of support from the government and other organizations.

The study also inquired if the learners had ever been exposed to substance abuse; i.e. whether they had ever consumed alcohol, smoked or chewed tobacco, chewed khat (locally known as *miraa*), used marijuana (known locally as grass, weed, pot, *bhangī*) or other illicit

substances (including local stimulants, jet fuel, cocaine, heroin, crack, *mrambe*, mandrax, miracle juice, glue/gum, etc.). They were also asked about the use of drugs such as tramadol, cough syrup, codeine to get *high* rather than treat an illness. About 10% of the learners had either consumed alcohol, smoked cigarettes or used illicit drugs. A significantly higher proportion of boys than girls reported having consumed alcohol and/or used an illicit substance.

While a majority of adolescents reported that they had engaged in non-penetrative sexual activities (spending time alone, holding hands, kissing, flirting, touching, oral sex, etc.), close to 5% reported that they had had sexual intercourse at least once with about 2% reporting anal sexual intercourse. More boys than girls reported experience with penetrative and most non-penetrative sexual activities. For instance, 7% of the boys reported that they had had sexual intercourse compared to 2% of girls. Similarly, more boys (4%) than girls (1%) reported experience with oral sex. Discussion of SRH issues among/with the learners was relatively low though a higher proportion of girls than boys had discussed sexual relationships, pregnancy and how it occurs, contraception, and how to manage pubertal changes. Our results from the qualitative component also confirmed that there were more SRH programs targeting girls even though boys are equally in need of such programs.

Conclusion

The results from the baseline survey highlight gender inequalities in key indicators that are important for achieving sexual health and wellbeing, not only in adolescence but over a lifetime. These findings suggest a need to invest in the sexual health and wellbeing of very young adolescents' with potential gains across the life course. The STaRS project aims to work with the school community to co-create evidence-based, low-cost interventions that can be implemented in schools to change social attitudes, practices, and beliefs in order to foster positive gender norms and improve adolescent SRH outcomes.

Introduction

Morbidity related to negative SRH outcomes is a major contributor to the burden of ill-health in sub-Saharan Africa (SSA) (Juárez and Gayet 2014) with HIV being the leading cause of death (Kassebaum et al. 2014). Young people navigate adolescence facing high risks of experiencing poor SRH outcomes (Beguy et al. 2011; Bello et al. 2017). In Kenya, adolescent girls and young women are disproportionately affected by poor sexual and reproductive health (SRH) outcomes including HIV infections, unsafe abortions, and unintended pregnancies (African Population and Health Research Center et al. 2013; Beguy et al. 2013; Kenya National Bureau of Statistics et al. 2015). The high level of SRH-related morbidity among Kenyan adolescents mars their smooth transition to adulthood, creates lifetimes of ill-effects and may result in avoidable deaths. Such poor outcomes have been associated with conventional gender beliefs and practices that place women and girls at a lower status than men and boys and which bar women and girls from experiencing their rights and full potential in regard to SRH choices (Dodoo et al. 2003; Jewitt and Ryley 2014).

Adolescents living in informal urban settlements/slums have been recognized as marginalized or vulnerable because of poverty and the harsh environment that they live in (Dodoo et al. 2003; Kabiru et al. 2012; Beguy et al. 2013). Manifestations of gender norms related to SRH are key in the context of the re-emergence of an “urban health penalty”, whereby adolescents living in urban poor neighborhoods suffer heightened risk of negative SRH outcomes as compared to their counterparts in more affluent neighborhoods. (UN-HABITAT 2003; Madise et al. 2012; Mberu et al. 2014; Mumah et al. 2014).

Early adolescence — the period of life between 10-14 years — is characterized by rapid physical, psychological, cognitive and social changes (Igras et al. 2014; McCarthy et al. 2016). This period marks the onset of puberty with boys and girls starting to have a growing interest in romantic relationships and sexual experimentation. While gender

socialization — learning of societal expectations, norms and beliefs among men and women based on their sex — begins early in life, it is during the early adolescence period that gendered learning is intensified (Hill and Lynch 1983). Inequitable gender norms about sexual relationships govern early expressions of sexuality. Boys tend to be pressured to demonstrate their manhood by becoming sexually active early, while girls are generally expected to abstain from sexual relations until marriage. Norms and practices of gender acquired during adolescence shape adolescents’ vulnerability to poor SRH outcomes such as early pregnancies, unsafe abortion, sexual violence, and sexually transmitted infections, including HIV with implications across the life-course. Sustainable Development Goal 5 (United Nations 2015) recognizes gender equality as a fundamental human right indicating an increasing global awareness that the early adolescence period presents an opportunity for promoting equitable gender norms to secure young people’s safe transition to adulthood.

A large proportion of very young adolescents (YAs) attend school, making schools an appropriate site for health promotion, including promotion of equitable gender norms and positive sexual health behaviors (WHO 1996). Schools also serve as a platform for the provision of essential knowledge for health, including sexuality education and life skills education (Patton et al. 2016). School attendance has also been found to be protective with many studies reporting that young people in school initiate sex later than their non-schooling counterparts (Igras et al. 2014; Kågesten et al. 2016) where most unwanted pregnancies, unsafe abortions, maternal deaths and sexually transmitted infections occur, investment in positive youth development to promote sexual and reproductive health (SRH). It is against this backdrop that the “*Starting right in schools (STaRS): Gendered socialization of very young adolescents in schools and sexual and reproductive health*” project was designed.

The STaRS project

STaRS is an implementation research project focusing on adolescents living in urban poor communities in three countries: Burkina Faso, Kenya and Nigeria. The project aims to identify and catalyze the replication of evidence-based, low-cost interventions that can be implemented to change social attitudes, practices, and beliefs in order to foster positive gender norms and improve adolescent SRH outcomes. Specifically, the study aims to:

- understand the processes and dynamics of gender socialization in the school environment
- examine the association between gender norms and SRH-related behavior, knowledge and attitudes among very young adolescents in schools that serve the urban poor
- identify, implement and assess evidence-based, low-cost interventions through which schools can foster positive gender norms and improve adolescent SRH outcomes
- foster networks, dialogues and collaborations to strengthen and sustain the delivery of effective

evidence-based, low-cost, school-based solutions that challenge gender inequities and negative gender stereotypes, as well as promote SRH among very young adolescents

This report is specific to the Kenyan arm of the study.

Theory of Change

Our theory of change (see Figure 1) posits that the key to sustainable change in gender norms and adolescent SRH rests on using robust and contextual evidence to inform solutions to problems, fostering an enabling normative environment, facilitating collaboration and networking around gender equity and adolescent SRH services at scale, ensuring supportive advocacy, and expanding individual and relational agency.

Interventions

The study interventions, which will be guided by the baseline data and co-developed with the study community, aim to foster changes in gender norms and will be

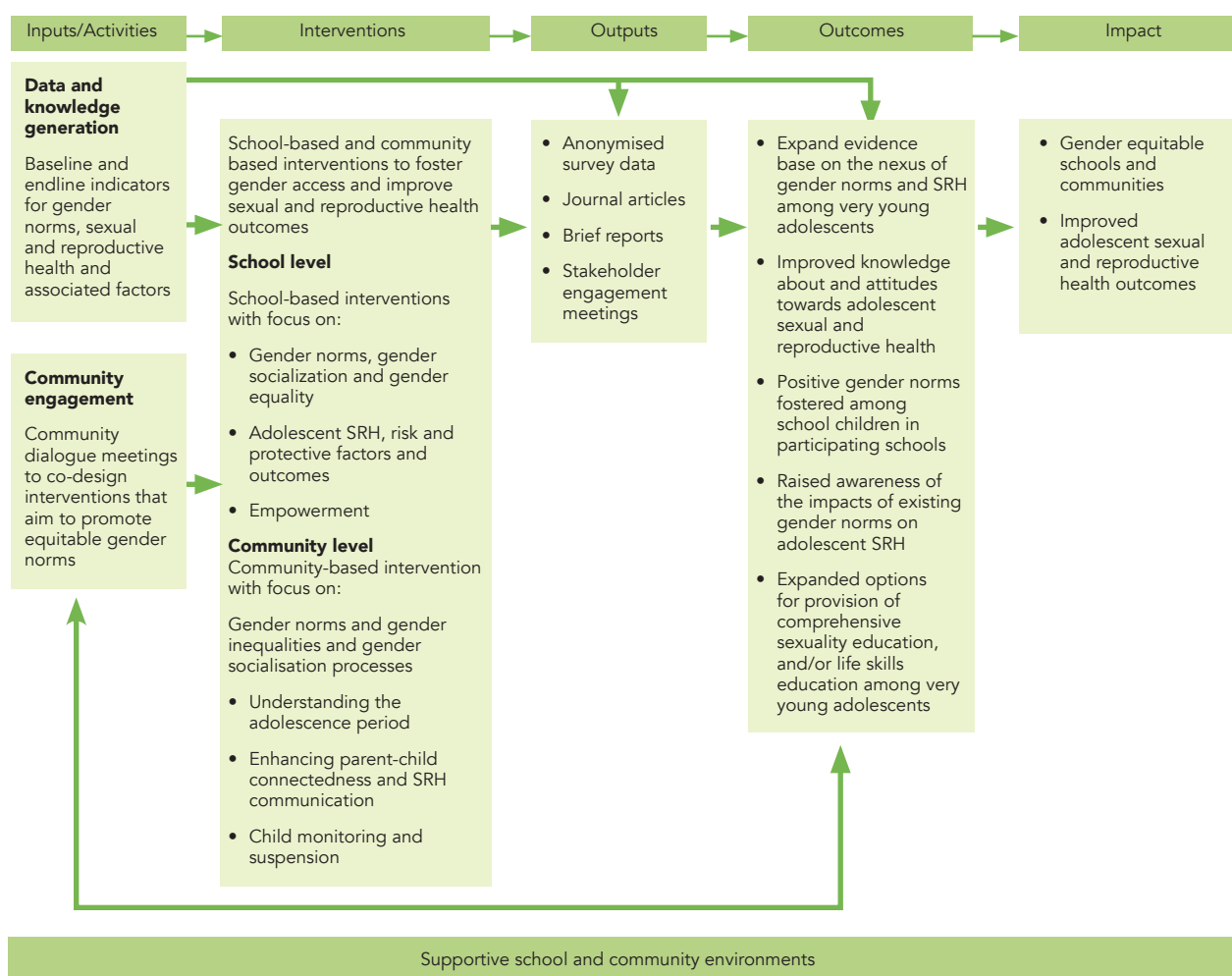


Figure 1: STaRS Theory of Change

administered within school and community settings at the intervention site. Our targets for change are adolescents in Grades 5 and 6 (at the time of baseline survey), through school-based interventions and their parents and teachers through community-based interventions. Interventions in each focal school will be rolled out among half of the learners in the target grades. The remaining streams in the target grades will benefit indirectly from the intervention through the agents of change i.e. teachers, parents and adolescents directly targeted by interventions through 'overflow' of intervention messages. There will be no interventions in the comparison schools. The interventions will be incorporated within the activities taking place during the after-school hours such as club time or sports time and will be mainly facilitated by highly trained facilitators, supported by school teachers.

Research methodology

The design reported here is the project design at conception. However, the project was adversely affected by the COVID-19 pandemic as schools were closed. At the time of completing this report, discussions about redesigning the remaining phase of the project were ongoing. More details are provided in the addendum.

Study design

The study adopts a stepwise approach starting with formative mixed-methods research to inform school community dialogues that are aimed at empowering school communities to collectively identify and implement evidence-based, low-cost interventions to foster positive gender norms and enhance SRH. Facilitators and barriers to the implementation of these low-cost interventions will be documented to inform future programming. The interventions will be evaluated using the pre- and post-test comparison group design to answer the question: What evidence-based, low-cost interventions can be implemented in schools to foster positive gender norms among very young adolescents in resource-limited urban settings? The comparison arm of the study will allow for identification of impacts attributable to the intervention

package directly or indirectly.

The study is being implemented in four public day schools located within two urban slums in Nairobi, Kenya, namely Korogocho (Kasarani sub-county) and Viwandani (Makadara sub-county). The two schools in Viwandani will serve as the intervention arm and the two schools in Korogocho will serve as the comparison arm (Figure 2). The four schools were identified following a school mapping exercise conducted within and around the two slums at the beginning of the study. The purpose of this exercise was to identify the type of primary schools that serve the populations living in the two sites. During the exercise, data on student population by age and sex, teacher population by age and sex as well as student population by age and sex in target grades 5 and 6 were collected. The four schools were purposively selected to participate in the study as they are located within the two urban slums and a large proportion of their population live within the two slums. The two slums are not in close proximity and there is minimal probability of intervention contamination.

The pre- and post-test evaluation stage will involve a mixed method approach using quantitative and qualitative data collected at baseline (May 2019) and endline (approximately in the first quarter of 2021). A quantitative survey of adolescents and teachers in the intervention and comparison schools was undertaken at baseline (May 2019). The same participants will be re-interviewed at endline using the same study instruments but with additional questions (in the adolescent survey) about participation in intervention activities. At endline, Photovoice will be used to document perceived changes in gendered behaviors. Photovoice is a visual participatory methodology that involves the taking of photos related to a specific topic otherwise known as a *prompt* (Wang and Burris 1997). Photovoice empowers the participant to be a core-researcher, rather than a mere respondent, and gives them a unique mode of expression, enhancing dialogue and reflection about sensitive topics of a personal or communal nature. This technique provides an alternative way of doing research with vulnerable and often under-acknowledged research participants such as the very young adolescents (Wang and Burris 1997). Focus group discussions were conducted with selected parents of adolescents in grades 5 and 6 in intervention school.

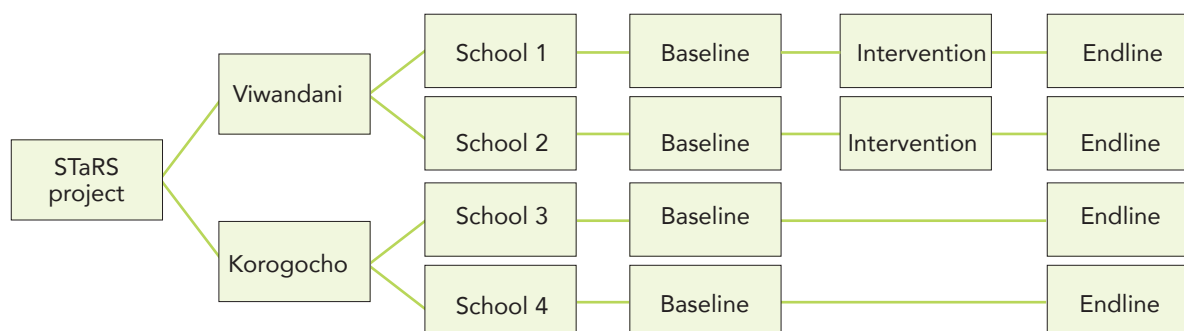


Figure 2: STaRS project design

Study sites

The study is being conducted in four public primary day schools that mainly serve the populations in Korogocho and Viwandani slums that are covered by the Nairobi Urban Health and Demographic Surveillance System (NUHDSS) (Figure 3). The NUHDSS is a prospective, longitudinal research platform run by the African Population and Health Research Center (APHRC) in the two slums since 2002 (Beguy et al. 2015). As at 2019, the NUHDSS population was about 88,974 individuals living in over 33,080 households.

Like other informal settlements in Nairobi, Korogocho and Viwandani are characterized by high levels of unemployment, sub-standard and overcrowded housing, limited education and social services, high levels of crime and insecurity, and inadequate water and sanitation infrastructure (Beguy et al. 2015). The major source of livelihood in these settlements is casual employment. While the two slums are similar in several ways, they show different demographic, economic, and health indicators. Korogocho is a stable community with a more settled population while Viwandani is a more transient community with a relatively youthful and highly mobile population seeking job opportunities in the nearby industries.

Study population

The project targets adolescents in grades 5 and 6 at baseline (majority of whom are likely to be aged 10 – 14 years). Based on the school population during the mapping

exercise, we estimated a population of approximately 687 adolescents in the intervention site and 458 adolescents in the comparison site. These were learners who were enrolled in school at the beginning of the school term.

To understand different facets of the school environment as they relate to gender norms and young people's health such as school health programs and facilities, as well as life skills or comprehensive sexuality education, we interviewed all teachers and head-teachers who had provided informed consent in the four participating schools at baseline. We plan to re-interview them at endline. The total sample was dependent on the number of teachers in each school at the time of interview and was estimated to be 88 teachers at the time of school mapping. The project also targets 60 parents at baseline in the intervention sites to participate in focus group discussions (FGDs). The FGDs will explore the views of parents/guardians around their children's gendered transitions into adolescence; their perceptions on how the school environment influences gender norms and sexual behaviors; their preferences regarding sexuality education content and teaching methodologies; their attitudes towards sexuality education, as well as their perceived levels of support for and/or opposition to sexuality education in schools. This will help to better understand the role of individuals and people in how power is negotiated and the potential for change.

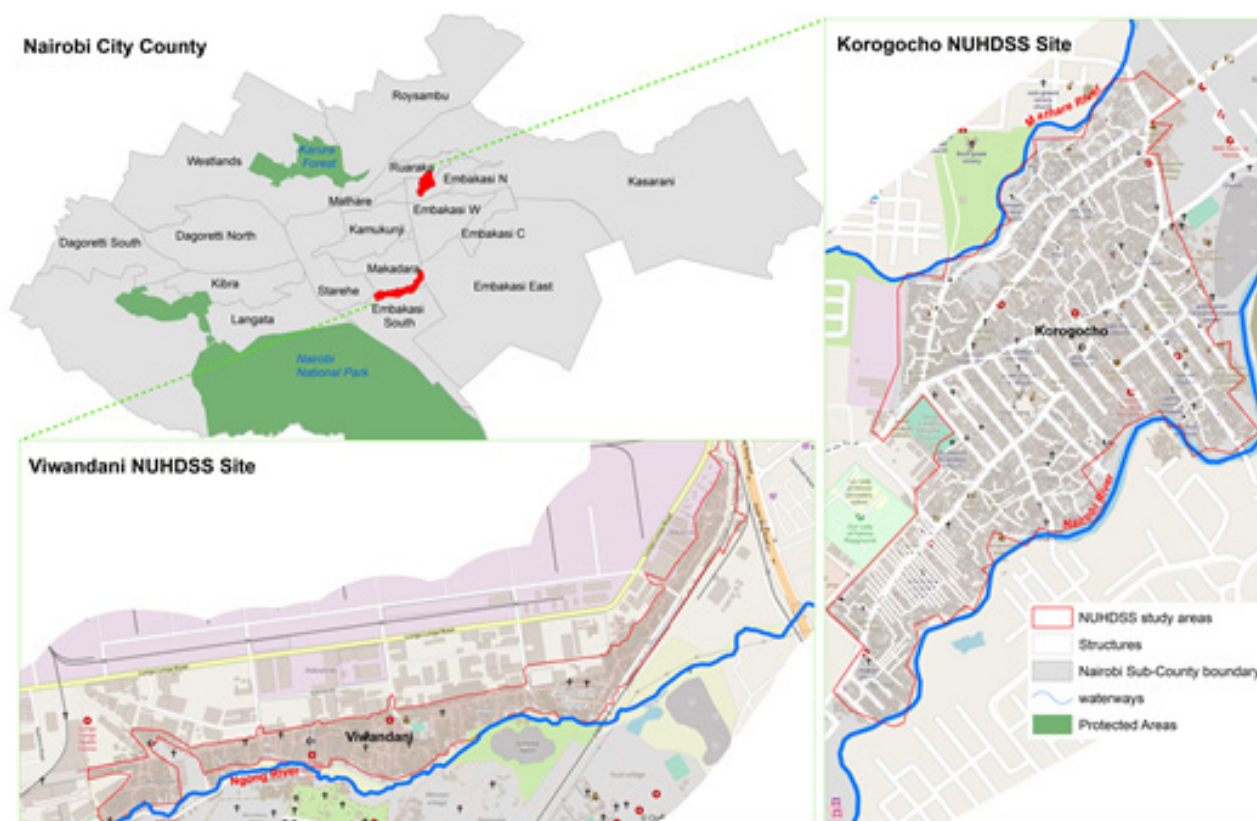


Figure 3: STaRS project sites

The baseline study

Quantitative surveys

Procedures

The baseline surveys were conducted in May 2019 by a team of 39 female and male field interviewers. The interviewers attended a one-week training and a 3-day refresher training on the survey background, methodology and research ethics as well as the use of the electronic data collection techniques. During the training, all data collection tools were reviewed item by item, both manually and electronically. Mock interviews and role-plays were conducted as part of the continuous training process. The tools were pre-tested in two schools outside the study areas for the fieldworkers to familiarize themselves with field procedures and the flow of questions, identifying any remaining issues with the tools such as missing questions. Four team leaders, who exhibited exemplary knowledge and experience were selected to supervise and oversee data collection at the site level, under the leadership of one fieldwork coordinator from APHRC.

Data were collected electronically on android tablets using SurveyCTO, a survey platform for electronic data-collection that is based on Open Data Kit (ODK). For the adolescent survey, a modified Computer-Assisted Personal-Interviewing (CAPI) technique was used whereby an interviewer was grouped with about five adolescents at every interview session. Each adolescent was assigned a tablet. An interviewer read each question and response options and the adolescent respondents entered their particular responses on their own tablets. Caution was taken to ensure the privacy and confidentiality of individual adolescent responses by ensuring adequate spacing between respondents. Additionally, to ensure that all participants moved at the same pace and to protect participants who might have had some sensitive experiences such as sexual activity, all skip patterns were removed from the tool and response options replaced with relevant not applicable response options. Interviews with teachers and head-teachers were based on Computer-Assisted Self-Interviewing (CASI). Interviews were conducted during after-school hours and on weekends to ensure routine school activities were not affected. All interviews were conducted either in English or Swahili, depending on the participant's preferences.

Study instruments

The **adolescent survey** tool was adapted from a toolkit developed collaboratively from a global network of researchers led by the Johns Hopkins Bloomberg School of Public Health and the World Health Organization (WHO) under the Global Early Adolescent Study (GEAS). The GEAS toolkit, which is available online (www.geastudy.org), comprises three instruments: a vignettes-based instrument to measure gender norms contextualized by specific relationship portrayals; a multi-dimensional scale to measure overall gender norms about relationships; and an

adolescent health and behavior instrument. The measures underwent face validity testing and pilot testing in each of the 15 GEAS sites, including Korogocho in Nairobi. We added questions to assess the exposure of very young adolescents to sexuality education; preferences regarding sexuality education content and teaching methodologies; attitudes towards sexuality education; as well as perceived levels of support for or opposition to sexuality education in schools. These additional questions were adapted from a study led by APHRC that focused on comprehensive sexuality education (Sidze et al. 2017).

The **teacher and head-teacher surveys** consisted of background characteristics, gender attitudes and teaching of SRH in schools. We used the Gender Equitable Men (GEM) Scale to measure attitudes towards gender norms in intimate relationships or differing social expectations for men and women. The domains included violence, sexual relationships, reproductive health and disease prevention, and domestic chores and daily life. In addition, we used the Gender Norm Attitudes (GNA) Scale to measure egalitarian beliefs about male and female gender norms. The GEM and GNA scales are widely used and have been applied in similar contexts (see: <https://www.c-changeprogram.org/content/gender-scales-compendium/about.html>). The teachers' survey also captured information on whether the participant teaches any SRH while the head-teacher survey, included questions on what SRH topics were taught, how the topics were taught, by whom and in which classes, whether guidelines and curriculum for teaching SRH topics were available, and whether there was teacher training and support on SRH education.

Measures

While we collected data on a broad range of adolescent and teacher characteristics, only selected measures are used in this report. For adolescents, this includes selected measures on:

- *Socio-demographics*
- *Family structure, connection, and monitoring*
- *Schooling characteristics*
- *Peer characteristics*
- *Neighborhood control, cohesion and safety,*
- *Media access and use*
- *Health literacy and access to reproductive health information*
- *Adolescent health*
- *Pubertal maturation*
- *Mental health*
- *Romantic relationships*
- *Sexual behavior*
- *Empowerment*
- *Future expectations*
- *Gender norms*

Among teachers, reported measures include:

- *Background characteristics,*
- *Delivery of reproductive health education in schools*
- *Gender norms.*

Detailed information about coding and definition of reported measures can be found in Appendix 1. Additional information about gender norms is provided below:

Adolescents' gender attitudes

Adolescents' gender attitudes were assessed using 46 items. We conducted exploratory factor analysis to identify the factor structure of the 46 items. A factor loading of 0.4 and above and a Cronbach's alpha of 0.60 were considered adequate. A total of five items that did not load well on any of the factors (had a factor loading of less than 0.4 across all factors) were dropped. Items that cross-loaded on more than one factor were identified with the factor where the loading was highest. A total of six factors namely sexual double standards, gender role attitudes, stereotypical views about strength and weakness, premarital sex permissiveness, heteronormative relationships, and gender non-conformity were identified and are described further in Appendix 1. We used mean score to assess factor endorsement.

Teachers' gender attitudes

Teachers' gender attitudes were assessed using six different scales (domains) obtained from Compendium of Gender Scales developed by the C-Change project. Each domain was made up of a list of items (ranging from 4 in the *equity for girls* domain to 10 in the *rights and privileges of men* domain). Violence, sexual relationships, reproductive health and disease prevention and domestic chores and daily life domains were scored on a 3-point Likert scale (1=agree, 2=partially agree, 3=do not agree) while rights and privileges for men and equity for girls were scored on a 2-point Likert scale (1=agree, 2=disagree). High scores represent high support of gender equitable norms. We used mean scores to assess factor endorsement. Additional information on the teachers' gender attitudes can be found in Appendix 1.

Data management and analyses

Data collected electronically were verified by the field supervisors and synchronized daily to a SurveyCTO online database, with access only available to the data manager and the data analyst. The data analyst checked synced data for quality and accuracy and any data inconsistencies were reported back to the field supervisor for corrections before data could be accepted for further cleaning. Once data collection was complete, the data were then extracted from the SurveyCTO database and converted into Stata format for cleaning and analysis using Stata 15 software.

The baseline report describes selected indicators and cross-tabulations by study arm and sex. For categorical variables, significant tests were estimated using Pearson's Chi Square or Fisher's exact test while for continuous variables (specifically the gender norm scores), the t-test was used to identify significant differences between the means of intervention and comparison groups as well as between boys and girls.

Qualitative methods

Qualitative data collection involved focus group discussions (FGDs) with parents and Photovoice activities with selected adolescents and teachers.

Focus Group Discussions

A semi-structured FGD guide developed collaboratively with study consortium partners in Nigeria and Burkina Faso was used. This consisted of guiding questions on transitions to adolescence, romantic relationships, sexuality education and gender socialization. Six FGDs were planned in the intervention schools with parents grouped by gender and the sex of their adolescent child as follows: fathers of adolescent boys, fathers of adolescent girls, mothers of adolescent boys, mothers of adolescent girls, fathers of adolescent girls and boys and mothers of adolescent girls and boys. All qualitative discussions were audio-recorded with permission from participants.

Photovoice activities

A Photovoice guide developed collaboratively with study consortium partners in Nigeria and Burkina Faso was used in the study. Prior to the exercise, adolescents and teachers involved in the Photovoice activity were trained by a team of researchers and qualitative interviewers with experience using Photovoice. Topics during the training included using a camera to take and select photos, printing the photos and presentation of the photos. Adolescents and teachers were also trained to take non-intrusive pictures that would not reveal the subjects' identities. After the training, adolescents and teachers were paired separately and given cameras to take photos in the school and neighboring community depicting:

- Activities/things that only girls or only boys are required to do or say (at school, home or in the community);
- Girls/boys who break the rules and do things they are not required to do;
- Places that only girls/only boys are allowed/not allowed to go;
- Something that makes it difficult for boys/girls your age to study, attend school fully or participate in activities at school or in the community;
- Something that makes it easy for boys/girls to study, attend school fully or participate in activities at school or in the community;
- Something that influences how boys/girls behave (this could be at school, home or in the community);
- A person that influences how boys/girls behave (this could be at school, home or in the community/ outside the community, including a friend, parent, relative, member of the community or an actor, politician, religious leader outside the community).

After taking the photos, each group of participants selected the photos they wanted for presentation, provided captions and discussed the photos. The discussions were captured on audio recorders with permission from participants.

Data management and analyses

All audio recordings were transcribed verbatim (those in English were transcribed directly into English, while those in Swahili or with a mix of Swahili and English were transcribed to English) by two bilingual transcribers. Transcripts were then uploaded on Nvivo 12 for coding and analysis. Data were coded inductively whereby two data coders working closely with one researcher read through the transcripts identifying emerging concepts and themes. The initial set of codes was reviewed by the research team and merged or split as the team deemed necessary. A final set of codes and respective quotations was reviewed by the research team.

Ethical considerations and study permits

Ethical approval was obtained from AMREF Health Africa Ethical and Scientific Review Committee. Approval to conduct the study in schools was received from the National Commission for Science, Technology and Innovation (NACOSTI), and Directorates of Education in Nairobi County and Kasarani and Makadara sub-counties. We also sought permission to conduct the research from the head-teachers in each school.

Informed consent for adolescent participation was received from their parents/guardians prior to data collection. Adolescents were also required to provide written informed assent to participate in the study. Teachers and parents participating in the study provided informed consent prior to their participation.

To minimize any potential risks stemming from participation in the study, all project staff completed a research ethics course prior to field work. Quantitative data were uploaded daily to a central data repository where all data files were maintained in a secure server and all data anonymized during analysis. Adolescents were screened for emotional distress immediately following the quantitative survey and linked to appropriate care if they were distressed.

Response rates

Quantitative

A total of 907 adolescents (381 in comparison and 526 in intervention sites) participated in the quantitative survey with a 79% response rate. A total of 86 teachers were interviewed, 55 and 31 in the intervention and comparison sites respectively, achieving a 98% response rate. The main reason why a significant proportion of adolescents was not reached was because their parents did not provide written consent for their participation in the study.

Qualitative

FGD: A total of six FGDs with 6-9 parents/guardians (44 participants in total) were conducted in the intervention schools. Twenty-four women and 20 men participated in the discussions.

Photovoice: Twenty-four adolescents (3 groups of girls and 3 groups of boys per intervention school, with each team consisting of 2 adolescents) and 12 teachers (6 males and 6 females) participated in Photovoice activities to document perceived gendered behaviors as well as the barriers and enablers to the development of positive gender norms and SRH.

Results

This section describes the baseline characteristics of adolescents in grades 5 and 6, as well as teachers in the four participating schools. We first present adolescents' data in terms of socio-demographics, family, school, peers, neighborhood, media, health literacy and information, adolescent health, romantic relationships and sexual behavior, and empowerment characteristics. We then present the characteristics and gender attitudes of teachers. The results are compared across the intervention and comparison sites and by sex of the respondents (girls versus boys). Results from the quantitative data are triangulated with the qualitative results from the Photovoice exercise with teachers and adolescents as well as FGDs with parents.

Key issues that came up from the qualitative analysis focused on: changes occurring during adolescence; challenges and risks during adolescence and parental responses to these challenges; environmental influences on adolescent behavior; gender socialization and expectations; romantic relationships and sexual behaviors; and, sexuality education. For the Photovoice activities, adolescents took a total of 120 photos and selected 30 for discussion with key issues centering on gender roles and responsibilities, interpersonal relationships, future expectations for boys and girls and life challenges and risks that boys and girls encounter while attending to normal daily activities. Teacher discussions centered on activities that boys/girls were allowed or not allowed to do in school based on their gender and were based on 20 out of 60 photos taken by teachers.

Adolescent survey

Baseline findings from the adolescent survey are presented here.

Respondent characteristics

Table 1 presents the socio-demographic characteristics of adolescents participating in the study. There were significant differences by age between adolescents in the intervention arm and those in the comparison arm. Adolescents in the intervention arm were relatively younger with over half (53.8%) being younger than 12 years compared to a third (32%) of adolescents in the comparison arm.

Forty percent of adolescents in the comparison arm were of Luo ethnicity, 25% were Luhya/Teso, and 24% were Kikuyu. In contrast, the highest proportion of adolescents in the intervention arm were Kikuyu (28%), Luhya/Teso (22%) and Kamba (19%). Relative to the comparison arm, a higher proportion of adolescents in the intervention arm were born in a rural area (11% and 23% respectively). About 24% and 13% of adolescents in the comparison and intervention schools respectively were not living in the two study sites.

Table 1: Socio-demographic characteristics of adolescents by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Sex						
Boys	41.5	42.4	0.780			
Girls	58.5	57.6				
Age (Mean (SD))	12.0 (1.24)	11.5 (1.15)	<0.001	11.6 (1.20)	11.8 (1.25)	0.006
Ethnicity						
Kikuyu/Embu/Meru	23.6	28.1	<0.001	26.2	26.3	0.602
Luo	39.6	11.0		23.4	22.6	
Luhya/Teso	24.4	22.4		23.2	23.4	
Kamba	5.0	19.4		12.0	15.2	
Kisii/Kuria	1.8	12.2		8.0	7.6	
Others*	5.0	6.8		6.8	5.0	
Refused/missing	0.5	0.0		0.0	0.4	
Religion						
No religion	2.6	1.9	0.047	1.5	3.2	0.429
Catholic	42.3	33.3		37.1	37.0	
Other Christians	47.2	55.9		52.3	52.2	
Muslim	6.0	7.6		7.2	6.6	
Refused/missing/ don't know	1.8	1.3		1.9	1.1	
Migration status (from)						
Born in Korogocho or Viwandani	44.1	42.0	<0.001	40.7	45.9	0.002
Migrated from other urban areas	15.2	13.5		13.3	15.5	
Migrated from a rural area	11.0	21.7		17.9	16.3	

Characteristic	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Migrated from another country	2.4	3.0		1.9	3.9	
Studying but not living in site	23.6	12.6		20.3	12.9	
Not born in site but don't know where they migrated from	1.1	2.3		1.0	2.9	
Refused/missing	2.6	4.9		4.9	2.6	

*Other ethnic groups included Kalenjin, Somali, Borana, Garre, Ugandan nationality

We observed a significant difference between boys and girls by age and migration status. More girls (47%) than boys (42%) were younger than 12 years. A higher proportion of boys (47%) were born in the study site while a higher proportion of girls (21%) were not living in the study site. There were no significant differences between boys and girls by ethnicity and religion.

adolescents' gender socialization processes and sexual behaviors (Marcell et al. 2011; Kågesten et al. 2016; Somefun and Odimegwu 2018). Table 2 shows adolescents' families' characteristics. There was no significant difference by study arm in adolescents' household composition. By sex, more girls than boys lived with only one parent (48% and 42% respectively). Similarly, more girls (16%) than boys (10%) lived in households with other people (no parents and no grandparents).

Family characteristics

For majority of adolescents, family is the most immediate social environment. Family context therefore influences

Table 2: Family characteristics of adolescents by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Household composition						
Lives with both parents	31.2	38.8	0.095	31.4	41.5	0.001
Lives with one parent	50.1	42.8		48.4	42.3	
Lives with grandparents (no parents)	5.3	4.6		4.0	6.0	
Lives with others (no parents and no grandparents)	13.4	13.9		16.2	10.2	
Primary caregiver						
Biological/step-parent	87.1	93.7	0.003	89.5	92.9	0.138
Other (sibling, relative)	12.6	6.1		10.1	7.1	
Missing/refused	0.3	0.2		0.4	0.0	
Total number of siblings						
Zero	3.7	3.4	0.001	2.9	4.0	0.225
One – two	27.6	38.0		35.4	32.3	
Three – four	35.4	35.7		37.5	34.2	
Five and above	33.3	22.8		24.2	29.5	
Parental connectedness						

Characteristic	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Believes caregiver cares about what he/she thinks	67.2	74.1	0.030	72.4	69.7	0.240
Feels close to female caretaker	72.4	76.6	0.038	74.3	75.6	0.899
Feels close to male caretaker	52.8	53.4	0.723	44.3	65.4	<0.001

In households with both parents, nearly nine in ten adolescents indicated that their primary caretaker was the mother/stepmother. No differences were found by arm and sex. A higher proportion of adolescents in the intervention arm had a biological parent or step-parent as a primary caretaker compared to the comparison arm (94% versus 87%).

Fewer adolescents in the intervention arm (23%) than control arm (33%) reported that they had five or more siblings. With respect to parental connectedness, a greater proportion of adolescents in the intervention arm than control arm believed that their caretaker cared about what they (the adolescent) think (74% versus 67%) or reported being close to their female caretaker (77% versus 72%). Less than half of adolescent girls (44%) indicated that they feel close to their father or male caretaker compared with 67% of boys.

Peers

Peers play a major role in socialization of gender-typed behaviors, especially in early adolescence by reinforcing gender normative behaviors and stereotypes (Pettitt 2004; Cavanagh 2007; Kågesten et al. 2016). In Table 3, we characterize study participants by peer norms. There were no significant differences between arms except that about half of adolescents in the intervention arm reported spending time with close friends at least three times in a week compared to only 38% of adolescents in the comparison arm. Majority of adolescents tended to have same-sex friends with 46% of girls indicating that they had no male friends and 33% of boys indicating that they had no female friends. More boys than girls (55% of boys and 38% of girls) spent time with friends at least three times a week.

Table 3: Peer characteristics by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Friends						
Number of male friends						
Zero	24.7	29.3	0.360	45.8	1.8	<0.001
One-three	44.6	39.5		42.4	40.7	
At least four	30.2	30.8		11.2	57.2	
Missing/Refused	0.5	0.4		0.6	0.3	
Number of female friends						
Zero	14.7	16.6	0.358	3.0	33.3	<0.001
One-three	46.2	49.4		48.9	47.0	
At least four	38.9	33.5		47.9	18.9	
Missing/refused/Don't know	0.3	0.6		0.2	0.8	
Time spent with close friends						
Never	12.1	11.4	0.001	14.1	8.4	<0.001
Not often	49.4	37.6		47.2	36.2	
Often/very often	38.3	49.8		38.0	54.6	
Missing/refused	0.3	1.1		0.8	0.8	

Characteristic	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Close friends smoke cigarettes						
None	83.5	85.9	0.755	84.8	85.0	0.994
Yes (few, most, all)	8.4	7.2		7.8	7.6	
Don't know	5.8	5.1		5.5	5.3	
Missing/refused	2.4	1.7		1.9	2.1	
Close friends drink alcohol						
None	82.9	84.8	0.335	82.9	85.6	0.193
Yes (few, most, all)	8.9	7.8		9.9	6.0	
Don't know	5.3	6.1		5.5	6.0	
Missing/refused	2.9	1.3		1.7	2.4	
Close friends use drugs						
None	83.7	84.2	0.770	83.1	85.3	0.467
Yes (few, most, all)	6.3	7.0		7.8	5.3	
Don't know	7.1	6.8		6.7	7.4	
Missing/refused	2.9	1.9		2.5	2.1	
Close friends have dropped out of school permanently						
None	77.4	78.1	0.735	78.0	77.7	0.842
Yes (few, most, all)	14.4	15.4		15.4	14.4	
Don't know	5.8	4.9		4.8	6.0	
Missing/refused	2.4	1.5		1.9	1.8	

School connectedness

Majority of young people spend most of their time in school, making schools an important setting for health promotion, including promotion of equitable gender norms and behaviors. There were no differences in school grade by study arm and by sex with slightly more adolescents being in grade 6 than grade 5 (Table 4). Over 85% of adolescents aspired to study up to university/college level with no significant differences by arm or

sex. More than 80% of all adolescents felt that someone in school cared about them. Nearly six in ten adolescents in the comparison arm had missed school at least once in the past school month compared to about four in ten adolescents in the intervention arm ($p=0.002$). There were no significant differences in school absenteeism by sex. The main reasons for school absenteeism were sickness and lack of school fees.

Table 4: Comparison of adolescents' school connectedness by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
School grade						
Grade 5	46.2	47.3	0.733	44.9	49.6	0.158
Grade 6	53.8	52.7		55.1	50.4	
Schooling aspirations						
Primary incomplete	3.7	1.7	0.170	2.9	2.1	0.241
Primary complete	2.4	4.0		4.2	2.1	
Secondary complete	8.8	8.3		7.7	9.5	
University/college complete	85.1	86.0		85.2	86.2	
School care and support						
No one really cares	14.2	11.4	0.353	12.2	13.1	0.499
Yes, sometimes	34.7	31.8		35.0	30.2	
Yes, all the time	46.2	51.0		47.3	51.2	
Don't know/refused	5.0	5.9		5.5	5.5	
School absenteeism in past month						
None	42.5	55.3	0.002	52.3	46.7	0.313
1-2 days	38.3	29.6		31.6	35.7	
More than 2 days	17.6	13.3		14.3	16.3	
Don't know/refused	1.6	1.7		1.9	1.3	
Main reasons for school absenteeism *						
Sick/periods	57.8	62.0	0.369	61.4	58.1	0.479
Lack of school fees/ uniform	26.2	24.6	0.698	21.4	30.2	0.035
Family reasons	14.6	19.3	0.185	18.5	15.2	0.349
Other reasons	5.6	10.2	0.079	8.7	7.1	0.527
Refused/don't know	2.8	0.4	0.049	2.1	1.0	0.369
*Multiple responses						

Media access

Table 5 shows adolescents' access to and use of media. Nearly 80% of adolescents had access to television, about seven in ten had access to radio, nearly 60% had access to a mobile phone, while slightly more than three in ten adolescents had access to social media accounts with no difference by

arm. A higher proportion of adolescents in the intervention arm than control arm had access to computers (50% versus 42%, $p=0.024$). More boys than girls had access to media with significant sex differences being observed in access to television, radio, computer and mobile phone.

Table 5: Comparison of adolescents' access to and use of media by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Access to media						
Television	77.2	77.8	0.296	74.7	81.4	0.057
Radio	71.1	69.8	0.614	66.7	75.3	0.018
Computer	41.2	49.8	0.024	42.6	51.2	0.037
Mobile phone	60.9	58.6	0.521	54.9	65.9	0.002
Social media account	32.3	36.3	0.004	33.3	36.5	0.155
Television time						
None	25.7	27.8	0.529	25.3	29.4	0.406
Up to 2 hours	46.0	47.2		47.5	45.4	
More than 2 hours	26.5	24.1		25.5	24.7	
Refused to answer	1.8	1.0		1.7	0.8	
Computer/video games time						
None	56.2	55.5	0.363	60.7	49.1	0.001
Up to 2 hours	28.9	29.5		24.2	36.2	
More than 2 hours	11.8	13.5		12.7	12.9	
Use of internet or social media to access SRH content						
Accessed any of SRH content listed below	23.9	25.1	0.676	21.1	29.4	0.004
Puberty	12.6	13.9	0.146	11.4	14.7	0.079
Romantic relationships	7.9	7.8	0.531	6.3	10.0	0.007
Sex	6.3	6.5	0.237	4.4	9.2	0.000
Pregnancy	6.6	4.8	0.053	4.8	6.6	0.013
Pregnancy prevention methods	8.4	5.7	0.083	5.7	8.4	0.023
STIs	8.6	8.9	0.176	7.8	10.2	0.020
Menstruation	5.5	6.3	0.002	10.3		
Wet dreams	6.6	4.6	0.503		12.9	
Abortion	7.9	5.7	0.058	25.5	8.1	0.054
Pornography	8.4	7.4	0.385	6.3	10.0	0.005
Ever watched pornography (any source)	23.8	24.3	0.739	19.6	29.4	0.003

While there was no difference observed by arm in the time adolescents reported that they spent watching TV or playing computer/video games, significant differences were observed by sex with more boys (50%) than girls

(38%) playing computer/video games. In general, more boys than girls accessed SRH content on internet or social media with significant differences being noted.

Neighborhood context

The contexts in which adolescents grow up are likely to influence their behaviors. Some contexts offer protection, ensuring that adolescents are not exposed to harm while some contexts expose adolescents to risks (Juma et al. 2014; Stephenson et al. 2014). In Table 6 we describe adolescents' perceptions about their

neighborhoods. Over 75% of adolescents perceived their neighborhood as cohesive or somewhat cohesive, about 60% indicated some existence or availability of social control in their neighborhoods, and about 70% perceived their neighborhoods as safe or somewhat safe. These perceptions did not vary by arm or sex.

Table 6: Adolescents' neighborhood characteristics by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Neighborhood cohesion						
Not true at all	5.3	4.8	0.578	4.8	5.3	0.363
Not very true	17.1	16.9		15.8	18.6	
Somewhat true	33.1	28.5		29.1	32.3	
Very true	43.8	48.9		49.6	42.8	
Refused/DK/Missing	0.8	1.0		0.8	1.1	
Neighborhood social control						
Very unlikely	12.1	10.7	0.543	11.6	10.8	0.554
Not very likely	27.6	26.6		28.0	25.7	
Somewhat likely	32.8	30.2		31.8	30.7	
Very likely	26.0	31.2		27.0	31.8	
Refused/Don't know/Missing	1.6	1.3		1.7	1.1	
Neighborhood safety						
Not true at all	2.1	2.7	0.733	2.1	2.9	0.194
Not very true	25.2	26.4		25.3	26.8	
Somewhat true	57.2	55.1		54.9	57.5	
Very true	15.2	15.8		17.7	12.6	
Refused/Don't Know/Missing	0.03	0		0	0.3	

Gender norms

Gender is a social attribute for men and women based on their sex (Eagly and Steffen 1984; Brickell 2006). Gender roles portray sex-specific roles and responsibilities at all levels (Hill and Lynch 1983; Adler et al. 1992; Lindsey 2015). Gendered socialization which is the process of learning what is socially acceptable for males and females, is intensified in adolescence (Adler et al. 1992; Pettitt 2004; Kågesten et al. 2016). Table 7 shows the endorsement of gendered norms about masculinities and femininities. Results indicate a high endorsement of “sexual double standards” implying that adolescents agree that boys and girls are judged differently relative to the same sexual behavior; “gender role attitude” implying that there are strong views about specific roles for boys/men and girls/women in society; and “stereotypical views about strength and weakness in romantic relationships”

suggesting that physical attributes are an important feature in relationships. On the other hand, there was low endorsement of “premarital sex permissiveness” which indicates disapproval of premarital sexual activities; “heteronormative relationships” suggesting that adolescents did not perceive men as having a dominant role in romantic relationships; and “gender non-conformity” suggesting that adolescent boys and girls, men and women should adhere to their gender assigned roles and expectations. Endorsement of gender norms did not differ significantly across the two arms. By sex, boys had a stronger endorsement of the “stereotypical views about strength and weakness”, “premarital sex permissiveness” “heteronormative relationships” and ‘gender non-conformity’ in comparison to girls.

Table 7: Comparison of adolescents’ gender belief scores by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison Mean (SD)	Intervention (Mean (SD)	P-value	Girls Mean (SD)	Boys Mean (SD)	P-value
Sexual double standard	3.0 (1.08)	2.9 (1.05)	0.501	2.9 (1.11)	3.0 (1.00)	0.602
Gender role attitude	3.2 (1.26)	3.4 (1.18)	0.054	3.2 (1.24)	3.4 (1.16)	0.116
Stereotypical views about strength and weakness	2.9 (1.18)	3.0 (1.02)	0.113	2.9 (1.08)	3.1 (1.09)	0.001
Premarital sex permissiveness	2.1 (1.09)	2.2 (1.08)	0.426	2.0 (1.03)	2.3 (1.12)	<0.001
Heteronormative relationships	2.4 (1.13)	2.4 (1.10)	0.626	2.3 (1.12)	2.5 (1.10)	0.047
Gender non-conformity	2.0 (1.07)	2.0 (1.04)	0.970	2.0 (1.04)	2.1 (1.06)	0.039
Mean score (1-5, 5 indicating strongest approval of each sub-scale) (Mean +/- SD)						

Boys were more likely to endorse stereotypical views about strength and weakness, premarital sex permissiveness, heteronormative relationships and gender non-conformity. However, qualitative discussions with adolescents as well as their parents indicated that boys and girls are taught to promote equitable gender norms. Adolescents and parents, nevertheless, indicated that what adolescents are taught conflicts with their observations of men’s and women’s behavior within the settings they live in. For example, a parent in one of the FGDs explained, “There was a time my child told me that he has never seen his father cleaning utensils so why do I tell him to do so and then he told me that in future his wife will clean clothes and utensils for him...”

Additionally, adolescents, teachers and parents all indicated that different roles are assigned for boys and girls. For example, during a Photovoice discussion with teachers, one noted:

“...If you are taking care of the child, for example if you see a child in pre-unit walking or losing direction you will find it is a girl who will be called, “can you go and see that child”. So you find that the way the society views girls is that they are supposed to take care of the young ones as opposed to boys.”

Further, girls were considered to be physically weaker than boys and were therefore assigned less physically demanding roles. As a consequence, girls reported that they were proud to perform roles that would traditionally be meant for boys while boys felt that it was degrading to perform duties that are traditionally meant for girls, such as babysitting.

Empowerment

Empowerment among adolescents is a critical aspect of the gender socialization process and increases one’s sense of self-worth, ability to make decisions and access opportunities and resources (LeCroy 2004; Tolman 2012; Amin and Chandra-Mouli 2014). Table 8 summarizes the results on the empowerment-related measures (freedom of movement, voice and decision-making or behavioral control) by arm and by sex. Overall, there were significant differences in empowerment levels among adolescents by arm and by sex. Adolescents in the intervention arm reported higher levels of empowerment across the three domains compared to the comparison arm. On average, boys reported higher levels of empowerment across the three domains with significant differences reported in the voice and decision-making domains.

Table 8: Adolescent empowerment indicators by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Freedom of movement						
Never/rarely	78.7	79.5	0.062	85.7	70.1	<0.001
Sometimes/often	20.2	20.5		13.9	29.4	
Missing/refused	1.1	0.0		0.5	0.4	
Voice						
Never/rarely	49.6	35.6	<0.001	43.2	39.1	0.247
Sometimes/often	50.1	64.5		56.8	60.6	
Missing/refused	0.3	0.0		0.0	0.3	
Decision-making						
Never/rarely	53.0	44.9	0.024	55.9	37.8	<0.001
Sometimes/often	46.7	55.1		44.1	61.9	
Missing/refused	0.3	0.0		0.0	0.3	

As illustrated in the following quotes, the qualitative findings also showed that boys have more freedom to move and make decisions both in school and at home. Girls on the other hand, are socialized to be more cautious on where they go and who they associate with. When not in school, girls spend most of the time at home doing house chores, while boys are out playing with their friends.

"At this stage, they [boys] know how to look [for] money for themselves. They can collect plastics and metals and they sell them and when they get money, they cannot tell you and they will buy whatever they want with it ..." (FGD with parents)

"In the community, there is a game called PS [PlayStation]. They [boys] can spend most of their time playing it or also they can be shown dirty movies like pornography ..." (FGD with parents)

Moderator: *And when the girls are doing the house chores, what do the boys do?*

Respondent 7: *They go to play.*" (Photovoice discussions with pupils)

Adversity

Adverse childhood experiences (ACEs) are traumatic events that children may suffer in early life and which are likely to increase the risk of poor health and behavioral outcomes among adolescents (Hillis et al. 2004; Flaherty et al. 2013). As shown in Table 9, majority (nearly 70%) of adolescents had experienced at least one ACE. More boys than girls were likely to have experienced ACEs. For instance, more boys (31%) than girls (22%) reported being scared of being physically harmed or killed by their parents or other adults. Similarly, more boys (18%) than girls (9%) reported that a parent or guardian had drank too much alcohol or used drugs and been abusive to the adolescent or his/her family. About 11% of boys reported having been touched by an adult on their private parts (outside of times when they were being bathed) compared to 5% of girls. Similarly, about 6% of boys reported having been victims of attempted or forced sex compared to 3% of girls. Significant differences by arm were also observed for two ACEs. Forty-six percent of adolescents in the comparison arm compared to 36% in the intervention arm reported their families lacking adequate food because they had no money. A greater proportion of adolescents in the comparison arm than intervention arm (16% versus 11%, $p=0.009$) reported that their families had been forced out/ejected from of their home.

Table 9: Comparison of adolescents' adverse childhood experiences by study arm and sex, 2019

Adverse Childhood Experiences (ACEs)	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Ever experienced the following:						
Scared, felt unwanted	27.3	26.2	0.912	25.3	28.6	0.015
Scared of adults hurting you	27.3	25.1	0.743	22.4	31.0	0.009
Felt unloved/cared about	24.4	21.9	0.586	20.3	26.5	0.079
No one protects you	18.9	18.4	0.333	17.5	20.2	0.013
Totally on your own	21.8	25.5	0.371	23.6	24.4	0.018
Parents drank too much alcohol/ used drugs and were abusive	15.0	11.2	0.196	9.1	17.9	0.001
Family didn't have enough food	45.9	35.7	0.007	39.9	40.2	0.966
Ever seen mom being hit/beat- en/threatened	16.5	19.2	0.266	16.4	20.5	0.197
Ever seen dad being hit/beaten/ threatened	11.3	12.7	0.060	11.0	13.7	0.458
Ever seen mother/father very sad	19.7	17.3	0.526	15.0	22.8	0.002
Parents ever in jail	17.6	15.2	0.306	13.5	20.0	0.019
Family ever forced to leave home	15.8	10.5	0.009	10.5	15.8	0.027
Adult ever touched your private parts	8.1	7.0	0.275	5.3	10.5	0.013
Adult ever attempted/forced you to have sex	4.7	4.0	0.863	3.2	5.7	0.085
Experienced at least one ACE	68.5	68.6	0.817	66.7	71.1	0.319

Puberty and body comfort

Pubertal maturation, which takes place in early adolescence, marks the transition from childhood to adulthood. In this study, about two thirds of the

participants reported that they had begun experiencing pubertal changes (Figure 4).

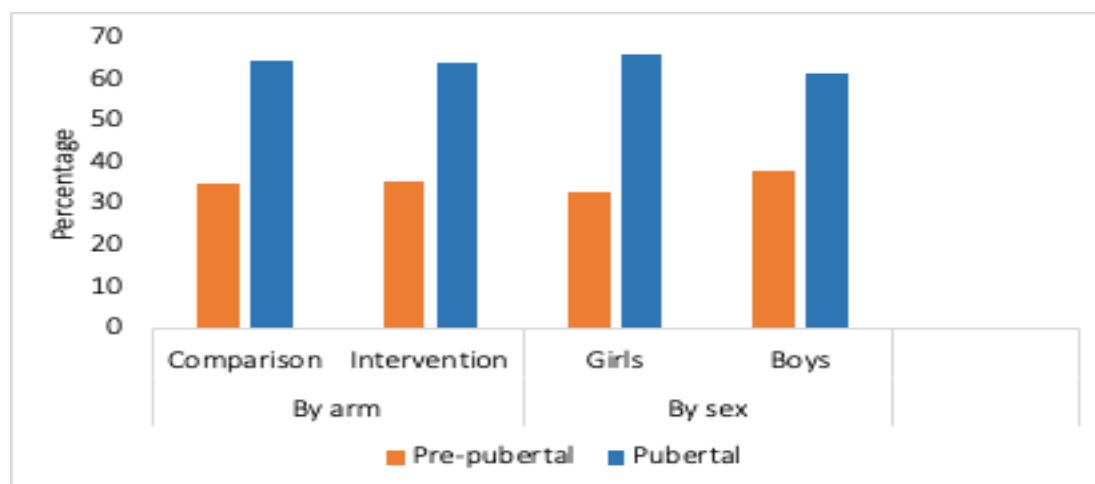


Figure 4: Percentage distribution of adolescents by pubertal maturation status, study arm and sex

For girls, changes included the growth of breasts and menstruation while for boys, pubertal maturation included changes in penis/testicle size, voice change, wet dreams and beard/moustache growth. More girls than boys reported that they had begun experiencing pubertal changes.

As shown in Table 10, the youngest reported age at menarche was nine years and the oldest was fifteen years. Majority of girls reported that they had access to sanitary products to manage the last period. Most (62%) reported that they had used disposable pads to manage their last period. Fourteen percent reported using reusable pads.

About 24% of those who had started menstrual periods had missed school during the last period cycle due to menstrual pains (12 girls), lack of sanitary products (10 girls), traditional beliefs (2 girls) and period-related bullying (3 girls).

Although 73% of girls who had undergone menarche reported that they were proud of their periods and a similar proportion (71%) indicated that periods were not “a big deal”, nearly half (47%) were ashamed of their bodies during periods and seven in ten indicated that it was important to keep their periods secret.

Table 10: Menstrual management practices for adolescent girls by study arm, 2019

Characteristic		By arm		
	Total N=111 (%)	Comparison N=68 (%)	Intervention N=43 (%)	P-value
Age at first menarche (N=111)				
Below 11 years	26.1	24.5	25.6	0.917
12 – 15 years	73.9	73.5	74.4	
Sanitary product (last period)				
Tampon	5.4	2.9	9.3	0.267
Disposable pads	61.6	62.3	60.5	
Reusable pads	14.3	17.4	9.3	
Menstrual cup	0.9	1.5	0.0	
Toilet paper	6.3	5.8	7.0	
Cotton wool	8.0	8.7	7.0	
Mattress	0.9	0.0	2.3	
Pieces of cloth	3.6	4.4	2.3	
Missed school during last period	24.6	20.9	30.2	
Reasons for missing school				
Pain	44.4			
Lack sanitary products	37.0			
Traditional beliefs	7.4			
Menstrual associated teasing/bullying	11.1			
Feelings about menstruation				
Ashamed of my body during periods	46.8			
My period tells me I am a woman	65.8			
Important to keep period secret	72.1			
Proud of periods	73.0			
Periods not a big deal	71.2			

Table 11 shows body comfort around pubertal changes for both boys and girls. We present the proportion of adolescents who “agreed a little” or “agreed a lot” with the statements on body comfort. No significant differences were observed by arm and sex. However,

a higher proportion of boys (46%) than girls (40%) were worried about how their bodies looked. More adolescent boys in the intervention (74%) than in the control (63%) arm felt handsome.

Table 11: Body comfort around pubertal changes by study arm and sex, 2019

Characteristic	By arm		By sex			
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
On the whole, I am satisfied with my body	68.2	66.5	0.491	69.0	64.8	0.508
I worry about the way that my body looks	42.8	42.0	0.871	46.6	36.5	0.021
I like the way I look	80.1	77.2	0.646	79.5	76.9	0.313
I like looking at my body	75.6	77.0	0.919	74.0	79.8	0.181
I often wish my body were different	46.7	45.4	0.490	47.2	44.4	0.451
I am worried that my body is not developing normally	45.7	45.4	0.999	47.7	42.5	0.158
I feel like I am beautiful	44.8	46.0	0.797	80.6		
I feel like I am handsome	25.2	31.2	0.075		68.2	

Violence

Experiences or expressions of violence can take many forms including verbal (bullying) or physical across different positionalities including victim, perpetrator and observer or witness. Table 12 shows experiences of violence among adolescent boys and girls. While there were no differences in witnessing situations of violence, victimization and perpetration of violence by study arm, more boys than girls had witnessed, experienced and/or perpetrated violence.

Results from the FGDs and Photovoice exercises suggested that girls are more cushioned and protected from harm compared to boys. As boys are often left to their own devices, they are more exposed to the risk of interpersonal violence and/or injuries.

Discussions with teachers also indicated that girls were more likely to receive assistance if they had negative experiences because there was a lot of support from the government and other organizations. In part, as illustrated in the quote below by a teacher in the Photovoice

discussion, this level of support was reported to stem from perceptions that girls are more vulnerable.

“So you find out that the girl child is really protected by so many organizations....Anything happening to the girl child is taken with a lot of weight. The teachers here can confirm to you; if a girl misses school for more than two, three, four days or even a week, it is very easy for a teacher even to remember when we have a meeting that there is a girl who is not in class for over a week... It is not the same for boys; ... making a follow up for that case for a boy you may take time. You may start making a follow up after something like ten days because maybe we believe that this boy is not vulnerable.” (Photovoice discussions with teachers)

Table 12: Experiences of violence among adolescents by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Witnessed verbal or physical abuse	39.1	41.1	0.838	36.3	45.7	0.005
Violence victimization						
Has someone touched you in a way that you did not want to be touched	12.9	10.3	0.109	8.6	15.2	<0.001
Have you been teased or called names by someone	33.1	26.2	0.082	23.6	36.9	<0.001
Have you ever been slapped, hit or otherwise been physically hurt by a boy or girl	26.5	23.0	0.015	21.9	28.1	0.018
Ever experienced any form of violence above	44.6	38.4	0.066	36.5	47.2	<0.001
Violence perpetration						
Have you bullied or threatened another boy or girl for any reason	21.5	19.2	0.326	15.8	26.3	<0.001
Have you ever slapped, hit or otherwise physically hurt another boy or girl	22.8	0.2	0.597	18.1	25.7	0.008
Ever perpetrated (any form of violence above)	29.1	27.2	0.808	23.0	34.9	<0.001

Boys were expected to withstand injuries or to “be strong”. Consequently, in contrast to the quantitative survey results which showed that boys were more likely to report that they had been victims of violence, the qualitative results suggested that boys were less likely to disclose that they had been victimized. These views are illustrated in the following quotations from Photovoice discussions with teachers.

“Boys face [more] challenges because most girls have received a lot of support from government ... You can get that when a girl has a problem in the house they will be attended [to] very fast because they know where to report such cases but a boy child even if they tell their fathers they have an injury they will be told by them to be strong.” (FGD with parents)

“We believe boys are stronger, that’s why they fear [to talk]. When they are going through challenges,

they cannot say. And it takes time, maybe they drop out of school, they go through the challenge, even including something like molestation they don’t say...” (Photovoice discussion with teachers)

Mental health

Mental health is a public health concern globally, especially among young people (Kleintjes et al. 2006; Patel et al. 2007; Agardh et al. 2012). Table 13 summarizes self-reported depressive symptoms. We present proportions of adolescents who responded *agree a lot* or *agree a little* to each of the items measuring reported depressive symptoms. Overall, there were no noticeable differences by study arm. By sex, a higher proportion of girls compared with boys reported agreement with the items *“I blame myself when things go wrong”*, *“I worry for no good reason”* and *“I feel sad”*.

Table 13: Self-reported experiences of depressive symptoms by study arm and sex, 2019

Item	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
In general, I see myself as a happy person	74.8	76.2	0.620	77.4	73.2	0.151
I blame myself when things go wrong	54.9	53.8	0.753	56.8	50.7	0.065
I worry for no good reason	48.3	46.2	0.532	50.4	42.5	0.019
I am so unhappy I can't sleep at night	39.9	38.6	0.692	39.9	38.1	0.570
I feel sad	40.9	39.2	0.589	42.8	36.0	0.039
I am so unhappy I think of harming myself	38.3	40.5	0.509	40.5	38.3	0.509

* 1 indicating poor mental state and 5 indicating good mental state

Alcohol and substance use

Adolescents were asked if they had ever consumed alcohol (except for religious purposes), if they had ever smoked or chewed tobacco, chewed khat (locally known as *miraa*), used marijuana (known locally as grass, weed, pot, *bhang*) or other illicit substances (such as kuber [a stimulant], msi, jet fuel, cocaine, heroin, crack, *mrambe*, mandrax, miracle juice, petrol, glue/gum, injectables). They were also asked about the use of drugs such as tramadol, cough syrup, codeine to get *high* rather than treat an illness. In Table 14 we report the proportion of adolescents who responded "Yes" to having ever indulged in any of the listed

substances. Generally, about 10% of adolescents had either used alcohol, smoked cigarettes or used illicit drugs. Drugs that were not prescribed to treat an illness were the most commonly abused with about 5% of adolescents reporting use.

There were significant differences by study arm and sex. A higher proportion of adolescents in the comparison arm reported having used alcohol and all the other substances compared to those in the intervention arm. By sex, a higher proportion of boys than girls reported alcohol and substance use.

Table 14: Alcohol and substance use by study arm and sex, 2019

Alcohol/substance use: Ever	By arm		By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	Girls N=526 (%)	Boys N=381 (%)	P- value
Drunk alcohol	6.0	3.2	2.9	6.6	0.026
Smoked cigarettes	2.9	1.7	1.3	3.4	0.005
Smoked marijuana	3.7	1.9	1.7	3.9	0.013
Used illicit substances	4.5	2.1	3.0	3.2	0.159
Used any drugs that were not prescribed to treat an illness	7.1	4.0	4.8	6.0	0.060
Total (ever used any substance/ alcohol)	13.4	7.8	8.2	12.9	0.066

Results from the qualitative discussions also indicate that substance/alcohol abuse was more common among boys than girls. Their vulnerability was partially ascribed to peer pressure. Due to their perceived vulnerability to alcohol and substance abuse, participants felt that boys needed to be educated about use of alcohol and illicit drugs. This view is illustrated in the following quote:

"Boys should be taught topics about drugs like for example cigarettes, bhang and miraa because it is being easy for them to get introduced to this by other drug abusers. For example, nowadays they say chewing khat does not have any effect since they are like leaves, but we should emphasize this in our community since it has become too much to our children." (FGD with parents)

Sexual health

Access to information, knowledge about sexual risks and vulnerabilities, access to sexual health care and living in contexts that promote sexual health are key to achieving sexual health and wellbeing (Stephenson et al. 2014; Wamoyi et al. 2014). Adolescents were asked questions that assessed their level of sexual health knowledge, where to access sexual health care and their self-efficacy in accessing sexual health services. Figure 5 below shows the levels of sexual health knowledge (mean scores) categorized as knowledge of how pregnancy occurs and pregnancy prevention methods; as well as knowledge of HIV transmission and prevention. A higher score for HIV transmission and prevention was observed among girls compared with boys.

Table 15 shows access to and confidence seeking SRH services. More boys than girls knew where to get condoms while more girls than boys knew where to get contraceptives. A higher proportion of girls than boys

reported that they would feel too shy or embarrassed to get a condom if needed to prevent pregnancy. While more than half of the adolescents thought they would be treated well if they sought contraceptives at a health facility, interestingly, (or as expected) more than half did not seem comfortable with visiting any of the facilities to seek such services.

Sexual experience and attitudes

Early sexual experience is often associated with unhealthy and risky behavior (Peltzer 2010; Zuma et al. 2010). Table 16 shows that a low proportion of young adolescents have already begun engaging in sexual activity. While a majority of adolescents reported engaging in non-penetrative sexual activities (spending time alone, holding hands, kissing, flirting, touching, oral sex, etc.), close to 5% reported that they had engaged in sexual intercourse with about 2% reporting anal sexual intercourse. Although there was no difference in the proportion of adolescents reporting sexual intercourse by arm, a higher proportion of adolescents in the comparison arm than in the intervention arm reported oral sex (3% versus 1%), holding hands (13% versus 7%), and flirting (7% versus 4%).

By sex, more boys than girls reported penetrative and most non-penetrative sexual activities. For instance, 7% of the boys reported that they had engaged in sexual intercourse compared to 2% of girls. Similarly, more boys (4%) than girls (1%) reported oral sexual experience. However, more girls than boys had sent a sexual picture of themselves to someone using phone, email or social media. There were no significant differences in sexual attitudes by arm and sex.

A higher proportion of adolescents in the comparison site and a higher percentage of boys reported having been in a romantic relationship.

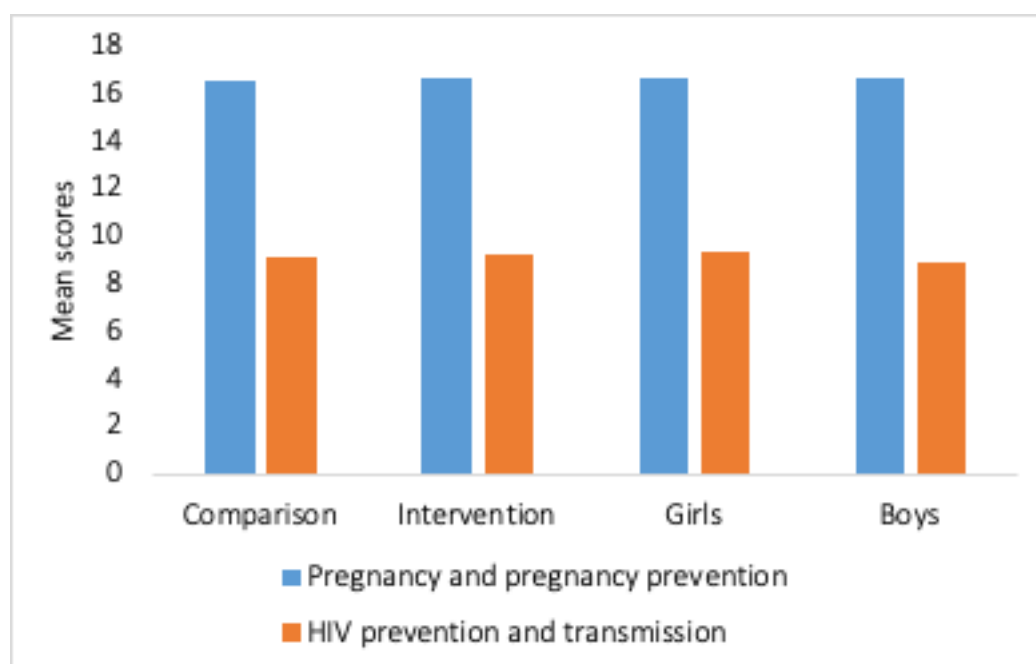


Figure 5: Mean scores of sexual health knowledge by study arm and sex

Table 15: Access to reproductive health services by study arm and by sex, 2019

	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Access to reproductive health services						
Knows where to go for information about menstrual periods (girls only)	57.9	60.1	0.777	59.1		
Knows where to go to get condoms	20.7	19.4	0.873	17.5	23.4	0.073
Knows where to go to get family planning	36.0	31.0	0.291	36.3	26.6	0.032
knows where to get treatment for HIV/STI	49.3	49.1	0.867	48.9	49.6	0.957
Confidence seeking family planning						
Feels too shy/embarrassed to go to a health facility for contraception	42.8	45.6	0.593	45.1	43.6	0.906
Feels too shy/embarrassed to get a condom if needed to prevent pregnancy	46.2	46.2	0.436	48.7	42.8	0.008
Thinks she/he would be treated well if in clinic, hospital or pharmacist for family planning	48.3	44.3	0.335	48.1	43.0	0.321

Table 16: Adolescent sexual experiences by study arm and sex, 2019

Sexual history (Ever had)	By arm			By sex		
	Comparison N=381 (%)	Intervention N=526 (%)	P- value	Girls N=526 (%)	Boys N=381 (%)	P- value
Sexual intercourse	4.7	3.6	0.091	1.9	7.1	<0.001
Oral sex	3.4	1.3	0.012	1.1	3.7	0.012
Anal sex	2.9	1.0	0.058	0.8	3.2	0.016
Touched another boy or girl or been touched by someone in a sexual way	7.9	4.9	0.172	3.6	9.7	<0.001
Spent time alone with someone you were in love with in private	8.4	6.1	0.074	3.2	12.3	<0.001
Held hands with someone you were in love with	12.6	7.2	0.004	5.1	15.5	<0.001
Hugged or cuddled with someone you were in love with	9.5	6.8	0.337	4.0	13.4	<0.001
Kissed/been kissed by someone on the lips	5.5	3.6	0.192	2.3	7.4	<0.001
Flirted with someone using phone, email, or social media	7.4	4.4	0.019	2.7	9.7	<0.001
Sent a sexual picture of yourself to someone using phone, email or social media	4.2	3.0	0.227	5.5	2.1	0.003
At least one sexual experience	17.6	14.1	0.149	8.8	24.9	<0.000
Ever been in a romantic relationship	16.3	12.4	0.021	7.4	23.1	<0.000
Sexual attitudes*	9.8 (4.1)	10.00(4.1)	0.4505	9.73(4.2)	10.18(4.1)	0.105

* The composite score ranges from 4 to 20, with four indicating positive sexual attitudes and 20 negative sexual attitudes

Sexual and reproductive health communication

Adolescents were asked if they had ever discussed with anyone about sexual relationships, pregnancy and how it occurs, contraception, HIV/AIDS and menstruation management for girls as well as wet dreams for boys. Noticeably, the proportion of adolescents who had discussed SRH issues was relatively low and while there were no significant differences by site, a slightly higher proportion of adolescents in the intervention site had had some SRH communication as shown in Figure 6.

By sex, a significantly higher proportion of girls than boys had discussed sexual relationships, pregnancy and how it occurs, contraception, and how to manage pubertal changes as shown in Figure 7. Results from the qualitative component provide some insights on the gender

differences as participants indicated that there were more SRH programs targeting girls although boys are equally in need of such programs.

"DREAMS project [a public-private partnership to reduce rates of HIV among adolescent girls and young women] has only helped girls and left out boys...a girl now can tell you everything about AIDS but boys don't know about this because they don't attend DREAMS classes so I am requesting that you should initiate DREAMS for boys project, so that our boys will get help because girls have been helped a lot." (FGD with parents)

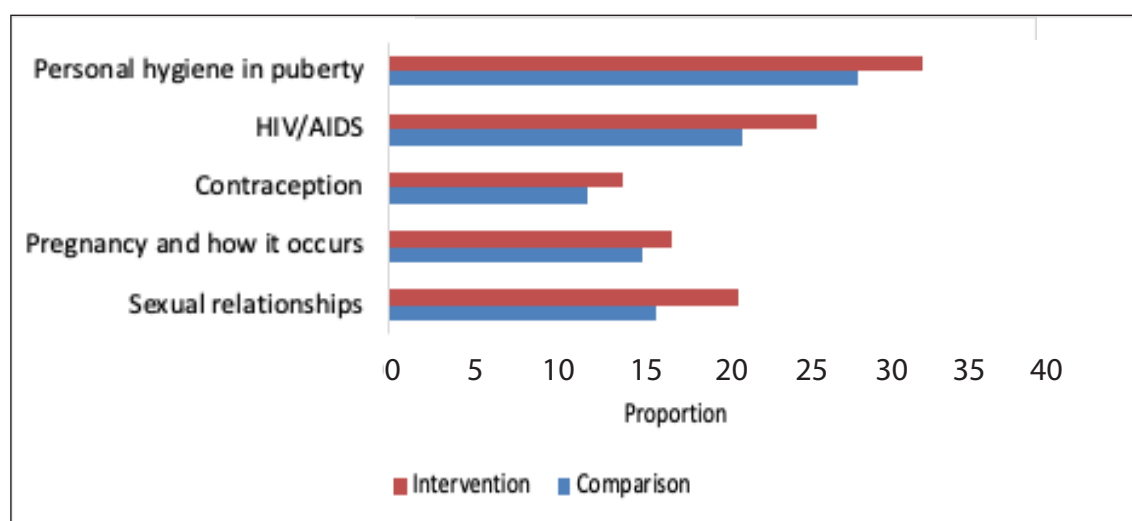


Figure 6: Percentage distribution of adolescents by SRH communication and study arm

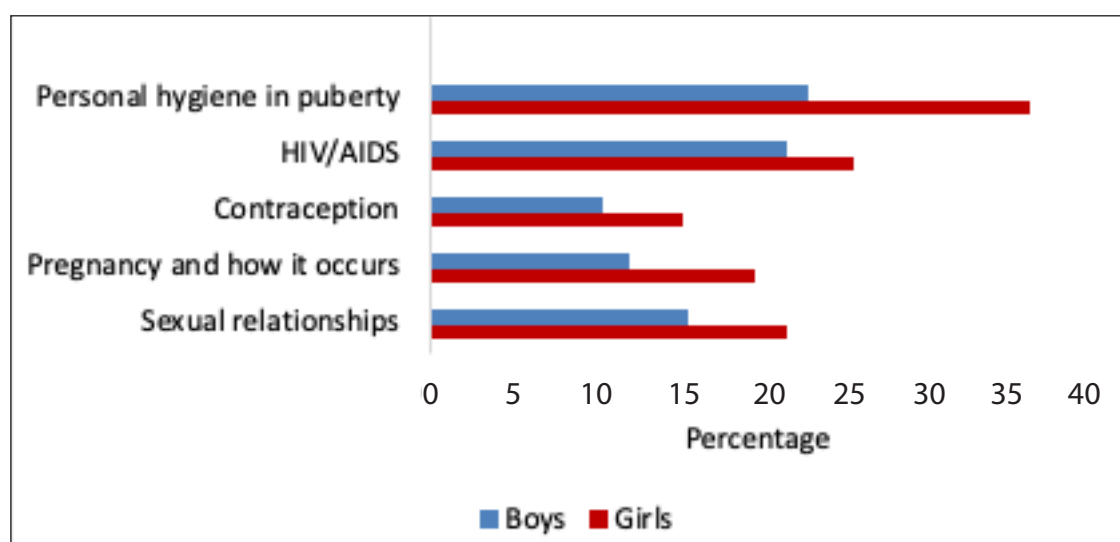


Figure 7: Percentage distribution of adolescents by SRH communication and sex

Reproductive health information source and delivery

Sexual and reproductive health information is essential for very young adolescents to gain knowledge and develop skills that will enable them to adopt risk avoidance or risk reduction behaviors (Dupas 2011; Finlay et al. 2020). Comprehensive SRH information covers a variety of topics such as, puberty, male and female reproductive systems, pregnancy and childbirth, abstinence, HIV/AIDS, pregnancy prevention methods, abortion, sexually transmitted infections (STIs), romantic and sexual relationships, making decisions about sex, violence and sexual abuse, affection, gender (including gender inequality), self-esteem, youth empowerment, sexual and reproductive rights and female genital mutilation (UNFPA 2014). SRH information can be delivered formally in school settings such as classrooms and clubs as well as in non-school settings. Our data show that more adolescents in the intervention site and more girls than boys were likely

to have received SRH education, both in school and out of school as shown in Figures 8 and 9. Table 17 shows how SRH information was delivered in school and sources of information in school and outside school.

Majority (nearly 70%) of the adolescents had received SRH information in school with significant differences between study arms and by sex. Boys were more likely than girls to report that they had received SRH information in class (81% versus 73%, $p=0.014$) while a higher proportion of girls (34%) than boys (23%) received SRH information from school clubs. This disparity could partially be explained from the qualitative findings where it was noted in the intervention arm that one of the schools conducted separate club days for girls and boys. A higher proportion of girls (11%) had received SRH information from mentors within the school settings compared to only 2% of boys.

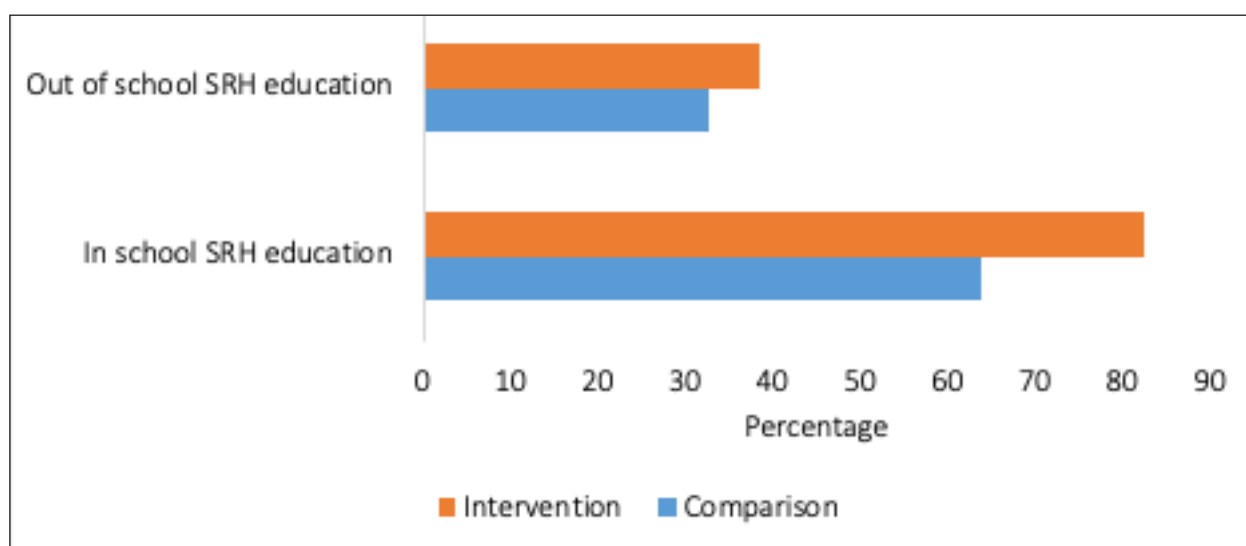


Figure 8: Percentage distribution of adolescents by source of SRH information and study arm

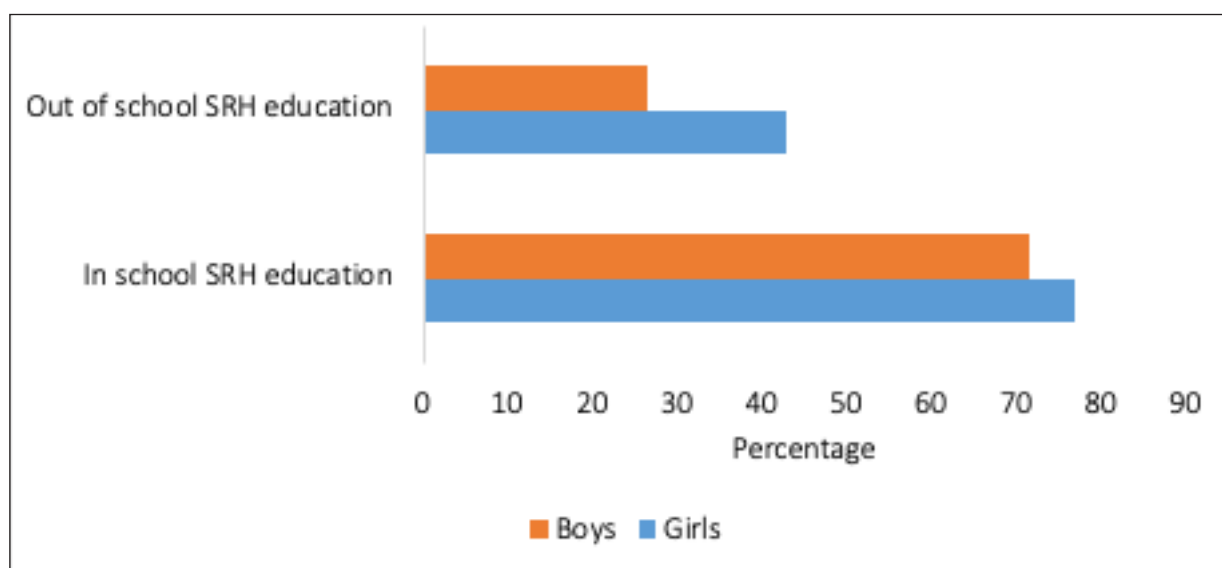


Figure 9: Percentage distribution of adolescents by source of SRH information and sex

Table 17: Reproductive health information source and delivery by study arm and sex, 2019

	By arm			By sex		
	Comparison (%)	Intervention (%)	P-value	Girls (%)	Boys (%)	P-value
Received reproductive health education in school setting	N=243	N=434		N=405	N=272	
In which settings did you learn about these topics in the school?						
Classroom	71.2	79.3	0.018	73.1	81.3	0.014
School clubs	33.7	27.4	0.084	34.3	22.8	0.001
Who taught you about these reproductive health topics in the school?						
School teacher	74.5	85.5	<0.001	79.0	85.3	0.039
Health provider	13.6	13.6	0.996	13.3	14.0	0.812
Peer educator	2.1	5.1	0.055	3.7	4.4	0.644
Religious person	2.9	3.2	0.804	2.7	3.7	0.480
Mentor	9.1	6.9	0.316	11.4	2.2	0.000
Received reproductive health education outside school setting	N=124	N=203		N=226	N=101	
In which settings did you learn about these topics outside the school?						
Home	29.0	37.9	0.101	30.1	44.6	0.011
Youth club	28.2	36.5	0.126	37.2	24.8	0.028
Religious setting	10.5	6.4	0.186	6.2	11.9	0.079
Health facility	12.9	13.8	0.819	8.9	23.8	<0.001
From a non-governmental organization	21.8	17.2	0.310	24.3	6.9	<0.001
Others	0.6	0.5	0.303	0.4	2.0	0.178
Who taught you about these reproductive health topics outside the school?						
Parent/caregiver	25.0	29.1	0.425	27.9	26.7	0.831
School teacher	20.2	29.1	0.074	26.1	24.8	0.796
Health provider	22.6	19.7	0.534	16.8	29.7	0.008
Peer educator	8.9	13.8	0.183	10.6	14.9	0.275
Religious person	6.5	7.4	0.748	4.4	12.9	0.006
Mentors	23.4	22.2	0.798	30.1	5.9	<0.001
Others	0.0	1.0	-	0.0	2.0	-

Outside the school setting, we observed marginal differences in the proportion of adolescents who had received SRH education by arm and significant differences by sex. A higher proportion of girls (43%) than boys (27%) received SRH information outside the school setting.

While boys were more likely than girls to receive SRH information at home and in health facilities, girls were likely to receive SRH information from youth clubs and non-governmental organizations.

Intimate partner violence

As shown previously in Table 16, a slightly greater proportion of adolescents in the comparison arm (16%) reported having been in a romantic relationship compared to those in the intervention arm (12%). Similarly, a significant proportion of boys than girls (23% versus 7%) reported having been in an intimate relationship. Table 18 shows the prevalence of intimate partner violence

among adolescent boys and girls who had ever been in a romantic relationship. About 45% of adolescent boys and girls who had ever been in a romantic relationship had experienced intimate partner violence with no differences by arm or sex. Similarly, about 39% had been violent to their partners with no differences by arm or sex.

Table 18: Intimate partner violence among adolescents who have ever been in a relationship by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison N=62 (%)	Intervention N=65 (%)	P- value	Girls N=39 (%)	Boys N=88 (%)	P- value
Victimization: Partner ever;						
Thrown something at you	41.9	33.9	0.320	38.5	37.5	0.886
Pushed, shoved, or grabbed you	33.9	23.1	0.254	23.1	30.7	0.298
Slapped you in the face or head	22.6	24.6	0.068	20.5	25.0	0.270
Hit/kicked you	21.0	20.0	0.625	20.5	20.5	0.969
Experienced any form of violence	49.2	42.6	0.467	46.0	45.9	0.995
Perpetration: Ever;						
Thrown something at partner	29.0	33.9	0.296	35.9	29.6	0.522
Pushed, shoved, or grabbed partner	19.4	20.0	0.669	25.6	17.1	0.158
Slapped partner in the face or head	16.1	21.5	0.456	20.5	18.2	0.422
Hit/kicked partner	16.1	21.5	0.651	25.6	15.9	0.305
Perpetrated any form of violence	37.7	41.3	0.685	41.0	38.8	0.816

Teacher and head-teacher surveys

Background characteristics

Four head-teachers (three females and one male, all with university education) representing the four schools in the study were interviewed. In addition, 86 teachers from the four schools were interviewed — their background characteristics are presented in Table 19. There were more female (53) than male (33) teachers with a higher proportion of teachers in the comparison arm being male (58%) and more female teachers in the intervention site.

Majority of the teachers were Christians with no significant differences by arm or sex. While there was no difference in education status by sex, a greater proportion of the teachers

in the intervention arm had tertiary education. Majority of the teachers were subject teachers with no other portfolio. In the intervention site, three teachers (6%) indicated that they were early childhood development and education (ECDE) teachers. Looking at sex, all assistant teachers were male, while more women than men were class- and subject-teachers. A higher proportion of male teachers were senior teachers, heads of department, deputy head-teachers. Three schools were headed by a female head-teacher with only one school headed by a male head-teacher (data not shown).

Table 19: Comparison of teachers' background characteristics by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison (%) N =31	Intervention (%) N=55	P-value	Male (%) N=33	Female (%) N=53	P-value
Sex						
Male	58.1	27.3	0.005			
Female	41.9	72.7				
Religion						
None	6.5	0	0.233	3.0	1.9	0.892
Catholic	29.0	27.3		30.3	26.4	
Protestant/other Christians	58.1	69.1		60.6	67.9	
Muslim	6.5	3.6		6.1	3.8	
Education						
Secondary	9.7	0.0	0.019	0	5.7	0.164
Tertiary (mid-level college / university)	90.3	100.0		100.0	94.3	
School position						
Assistant teacher	12.9	1.8	0.155	15.2	0.0	0.030
Class teacher	16.1	16.4		12.1	18.9	
Subject teacher	45.2	56.4		48.5	54.7	
Deputy/senior teacher	25.8	20.0		24.2	20.8	
Early childhood development education	0	5.5		0	5.7	

Reproductive health education (RHE)

According to the head-teachers, RHE was taught in three schools as part of the national education curriculum, while in one school, RHE was taught as an extra-curricular activity and as part of the national curriculum. It was not a requirement for the teachers to have any training or certification to teach RHE, though all the schools followed national standards and guidelines for teaching SRH topics in schools. RHE was mainly taught by science teachers in all the schools and was integrated within science, social studies, religious education and life skills lessons. For three schools, topics related to reproductive health were taught in grades 6, 7 and 8 while in one school, teaching began in grade 5. Table 20 shows the most common topics included in RHE in schools as reported by teachers (excluding head-teachers). About 75% and 68% of the teachers in comparison and intervention schools respectively had taught some RHE. Though no significant differences were

observed by sex of the teacher, a higher proportion of male teachers (82%) had taught RHE compared to female teachers (66%).

The top five RHE topics taught in the schools were HIV, pubertal changes, reproductive organs, menstruation and STIs while contraceptive access and use, sexual orientation, gender policies and abortion were covered by only four teachers. There were no major differences in the number of RHE topics taught by site or by sex of the teacher.

Results from interviews with head-teachers indicate that topics related to abortion, contraceptives, transactional sex, access to STI/HIV services, sexual and reproductive rights, sexual orientation and communication within relationships were prohibited.

Table 20: Delivery of sexual and reproductive health education by study arm and sex, 2019

Characteristic	By arm			By sex		
	Comparison (%) N =31	Intervention (%) N=55	P-value	Male (%) N=33	Female (%) N=53	P-value
Has taught RHE in current school						
Yes	67.7	74.6	0.499	81.8	66.0	0.113
No	32.3	25.5		18.2	34.0	
Most common RHE topics taught in school*						
HIV/AIDS	90.5	82.9	0.425	85.2	85.7	0.953
Puberty/physical changes in body	81.0	85.4	0.655	92.6	77.1	0.101
Reproductive organs	85.7	61.0	0.046	92.6	51.4	<0.001
Say no to sex/ abstinence /"chilling"	66.7	65.9	0.949	63.0	68.6	0.644
Menstruation	61.9	48.8	0.327	55.6	51.4	0.747
Other STIs	52.4	43.9	0.527	48.2	45.7	0.849
Sexual behavior	61.9	39.0	0.087	51.9	42.9	0.482
Decision-making skills	42.9	46.3	0.794	37.0	51.4	0.259
Moral issues related to sexuality	42.9	41.5	0.916	40.7	42.9	0.867
Pregnancy and childbirth	42.9	39.0	0.771	33.3	45.7	0.324
Positive living for young people living with HIV	52.4	24.4	0.028	33.3	34.3	0.937
Gender equity	38.1	31.7	0.615	44.4	25.7	0.122
Where to access STI/HIV services	42.9	29.3	0.285	37.0	31.4	0.644
Equality between men and women	38.1	29.3	0.482	37.0	28.6	0.480
Prevention of violence/sexual abuse	33.3	24.4	0.455	25.9	28.6	0.817
Communicating within relationships	19.1	22.0	0.790	14.8	25.7	0.296
Female genital mutilation (FGM)	14.3	24.4	0.355	11.1	28.6	0.094

Characteristic	By arm			By sex		
	Comparison (%) N =31	Intervention (%) N=55	P-value	Male (%) N=33	Female (%) N=53	P-value
Sex in exchange for money or gifts	19.1	19.5	0.965	14.8	22.9	0.427
Contraceptive methods	23.8	14.6	0.371	18.5	17.1	0.888
Gender inclusion	19.1	14.6	0.655	22.2	11.4	0.252
Sexual and reproductive rights	9.5	12.2	0.753	7.4	14.3	0.396
Abortion	4.8	14.6	0.245	7.4	14.3	0.396
Gender policies	4.8	14.6	0.245	7.4	14.3	0.396
Sexual orientation (homosexuality)	19.1	4.9	0.074	3.7	14.3	0.162
How to use contraceptive methods	14.3	7.3	0.380	7.1	11.4	0.595
Where to get contraceptive methods	9.5	4.9	0.481	7.4	5.7	0.788
*Topics ordered from most to least common based on proportion of teachers who indicated the topic as being taught in the school						

Gender attitudes

Table 21 shows six scales that were used to measure attitudes toward gender norms in intimate relationships or differing social expectations for men and women among the teachers. The domains captured gendered attitudes on violence, sexual relationships, reproductive health and disease prevention, domestic chores and daily life, rights

and privileges of men, and equity for girls. Overall, there was high endorsement of equitable gender norms among teachers, with no significant differences across sites and by sex. However, we observed marginal differences in the domestic chores and daily life domain with higher endorsement among female than male teachers.

Table 21: Teachers' gender attitudes by study arm and sex, 2019

Domains ^{\$}	Comparison Mean (SD)	Intervention Mean (SD)	P-value	Male Mean (SD)	Female Mean (SD)	P-value
Violence (score range 6 - 18)	17.0 (2.13)	17.0 (1.48)	0.955	17.2(1.60)	16.9 (1.83)	0.654
Sexual relationships (score range 8 - 24)	19.9 (3.00)	20.3 (3.03)	0.587	20.2 (2.50)	20.1 (3.30)	0.919
Reproductive health and disease prevention (score range 5 - 15)	13.2 (.52)	13.4 (1.54)	0.645	13.2 (2.20)	13.4 (1.77)	0.526
Domestic chores and daily life (score range 5 - 15)	11.7 (2.94)	12.2 (2.43)	0.346	11.4 (2.58)	12.4 (2.61)	0.074
Rights and privileges of men (score range 10 - 24)	19.0 (1.29)	19.2 (1.34)	0.626	19.2 (1.14)	19.0 (1.42)	0.511
Equity for girls (score range 4 - 8)	7.0 (0.98)	6.6 (1.08)	0.122	6.7 (1.07)	6.7 (1.06)	0.971

^{\$}High scores represent high support for gender equitable norms;

Despite the high endorsement of equitable gender norms, qualitative findings indicate that teachers' actions towards boys and girls were gendered

"Unconsciously, you will find out that when it comes to mopping, girls are mostly set. Taking care of the child, for example, if you see a child

in pre-unit walking or losing direction, you will find it is a girl who will be called, "Can you go and see that child". So you find out that the way the society views girls is that they are supposed to take care of the young ones as opposed to boys." (Photovoice discussion with teachers)

Key findings and implications

This report describes the characteristics of adolescent boys and girls who participated in the baseline survey for the STaRS project, which aims to assess whether low-cost, school-based interventions that are co-created with the school community are effective in promoting equitable gender beliefs and behavior as a pathway to healthy sexual development. Our target population was adolescents in grades 5 and 6, majority of whom were aged 10 – 13 years. Gender socialization is intensified during early adolescence, a period in which young people undergo intense physical, social, emotional, biological and cognitive changes (Galambos et al. 1990; Pettitt 2004). Early adolescents often align their thoughts, beliefs and behaviors with social and cultural expectations prescribed for men and women in their contexts (Perry and Pauletti 2011; Kågesten et al. 2016).

An important aspect of this study is identifying significant gender differences in key socio-economic and behavioral indicators. We found that at baseline, boys had higher levels of agency in terms of freedom of movement and decision-making than girls. Related to this, a higher proportion of boys reported access to media, spent more time playing computer and video games and often spent time with friends. These indicators may imply that boys are likely to spend more time outside familial places, which is often unsupervised. Unsupervised time alongside use of social media is likely to expose adolescents to risky behavior and access to age-inappropriate sexual content and information.

We found that boys were more likely than girls to endorse inequitable gender beliefs, and report alcohol and substance use, sexual activity and interpersonal violence. Alcohol and substance use, sexual activity, interpersonal violence and sexual-risk taking are prevalent in the study sites and have often been associated with masculinities (Jewkes and Morrell 2010; Amin and Chandra-Mouli 2014; Gibbs et al. 2014). The higher proportion of boys exhibiting these behaviors may be attributed to

descriptive norms associated with masculinities in their contexts. Additionally, boys reported lower levels of SRH knowledge, communication and access to SRH information. Although only a relatively small percentage of the adolescents had initiated sexual activity, it is a sizeable proportion given the young ages of the learners (10-13). In addition, the low levels of SRH knowledge put adolescents at an increased risk of poor outcomes including STIs and HIV infections. Collectively, these findings underscore the need for targeted programs for improving the health and wellbeing of boys.

Considering adolescents spend most of their time in school, teachers are a key agent in their gender socialization. Teachers in the four schools we surveyed endorsed equitable gender norms and beliefs, suggesting that they have the ability to transmit these norms and beliefs to young people. However, contexts in which teachers and adolescents interact are likely to influence how gender beliefs are enacted. Despite high endorsement of equitable gender norms, teachers were likely to portray gendered behaviors towards boys and girls, which are likely to correspond to norms within the community in which the schools are situated. Thus, guaranteeing a supportive school environment should be reinforced and/or encouraged at both the community and family levels to ensure that what is gained in school is retained at home.

Access to SRH information in school has often been marred by delivery challenges (Sidze et al. 2017; Keogh et al. 2018). Our findings show that SRH information delivered in the schools are largely centered on HIV/AIDS, pubertal changes, the reproductive system and practice of abstinence, most of which was likely to be delivered during the science lessons. There is need, however, to assess and ensure teachers' readiness to teach these topics as data obtained from head-teachers in the four schools surveyed showed that it was not a requirement for teachers to be trained on delivery of reproductive health education.

Conclusion

The results from the baseline survey highlight gender inequalities in key indicators that are important for achieving sexual health and wellbeing, not only in adolescence but across a lifetime. The STaRS project aims to address these gaps by working with the school community to co-

create evidence-based, low-cost interventions that can be implemented in schools to change social attitudes, practices, and beliefs in order to foster positive gender norms and improve adolescent SRH outcomes.

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Appendix 1: Reported measures

Characteristics	Description of variable/question/statement and their values
Adolescent survey	
Socio-demographic	
Sex	Sex of the respondent. 0=female; 1=male
Age	Age of the respondent. Reported age ranged (9 - 16)
Ethnicity	Ethnicity of the respondent. 1=Kikuyu/Embu/Meru; 2= Luo; 3=Luhya,Teso; 4= Kamba; 5= Kisii/Kuria; 6=Others (Kalenjin/Somali/Borana/Garre/other nationalities)
Religion	Religion of the respondent. 1=None; 2=Catholic; 3= Protestant; 4=Pentecostal/Charismatic = Other Christian; 6. Muslim; 7. Other
Migration status	Born in (Korogocho/Viwandani) or migrated from elsewhere. 1=Born in Korogocho/Viwandani; 2= Other slum in Nairobi; 3=Other non-slum in Nairobi; 4=Another city/urban area in Kenya; 5=A rural area of Kenya_____ (Select County); 6=Another country; 7=Studying in a school in Korogocho/Viwandani, but not living here; 8=Don't know where they came from
Family	
Household composition	Living with parents. 1=Lives with both parents; 2=Lives with one parent; 3=Lives with grandparents (no parents); 4=Lives with others (no parents and no grandparents)
Primary caregiver	Who is the person who most looks after you/takes care of you? 1=Biological/step-parent; 2= Others (sibling, grandparents, other relatives/non-relatives)
Siblings	Number of sisters and brothers that respondent has. 0=Zero; 1=One - two; 3=Three - four; 4=Five and above
Parental connectedness	A composite measure of three items: 1) Feels caregiver cares about what he/she thinks 2) Feels close to female caretaker 3) Feels close to male caretaker. 1= Not at all; 2=Not much; 3=Somewhat; 4=A lot. Cronbach's alpha=0.50
Peers	
Male and female friends	Number close male and female friends. For each: 0=Zero; 1=One-three; 2=At least four
Time spent with close friends	During a normal week, how often do you spend time with your close friends outside of school? 1= Never (no times per week); 2= Not very often (1 or 2 times a week); 3= Often (3-4 times a week); 4=Very often (nearly every day)
Peer antisocial behaviors	Close friends who smoke cigarettes, drink alcohol, use drugs, or dropped out of school. For each: 1=None; 2=Few; 3=Most; 4=All
School connectedness	
School grade	School grade respondent is currently attending. 1=Grade 5; 2=Grade 6
Schooling aspirations	How much school do you think you will complete? 1=Primary incomplete; 2=Primary complete; 3=Secondary complete; 4=University/college complete
School care and support	whether respondent feels that there is an adult (a teacher or someone else) in school who really cares about him/her as a person? 1=No, no one really cares; 2=Yes, some of the time; 3=Yes, all the time

Characteristics	Description of variable/question/statement and their values
School absenteeism	Number of days respondent missed school in the past month; Among those who missed school, main reasons for missing school. 1=None; 2=1-2 days; 3=3-5 days; 4=More than 5 days For those who missed school: 1=Sick; 2=Lack of school fees; 3=[Girls only] Having my period; 4=Help out at home e.g. because of a sick relative; 5=Babysit younger brothers/sisters; 6=Work to earn money; 7=Hang out with friends; 8=Studying for exam; 9=To attend family events e.g. funeral/burial; 10=School indiscipline e.g. not doing homework
Media	
Access to media	Access to: 1) television, 2) radio, 3) computer/laptop/tablet with internet connection, 4) mobile phone, 5) social media account. For each item, 1= No, do not have; 2=Yes, in school; 3=Yes, it is in my house; 4= Yes, I have my own
Television time and Computer/video games time	Number of hours respondent spends watching TV or using other media on a typical school day. For each: 1=None; 2=About 1 hour or less; 3=About 2 hours; 4=About 3 hours; 5=Between 4 and 5 hours; 6=More than 5 hours
Use of internet or social media to access SRH content	Content accessed through internet or social media: Puberty; Romantic relationships; Sex; Pregnancy; Pregnancy prevention methods; STIs; Menstruation; Wet dreams; Abortion; Pornography. For each item, 0=No; 1=Yes
Ever watched pornography	Ever watched pornography. 1=Never; 2=Rarely; 3=Sometimes; 4=Often
Neighbourhood context	
Neighbourhood cohesion	4 items on a 4-point scale: People in my neighbourhood look out for and help their neighbours; People in my neighbourhood can be trusted; People in my neighbourhood know who I am; People in my neighbourhood care about me. Cronbach's alpha=0.71
Neighbourhood social control	5 items on a 4-point scale measuring the likelihood that an adult in the neighbourhoods would do something if children or teenagers were: Damaging property; Painting/spraying paint/writing/drawing on walls (graffiti); Bullying or threatening another person; Fighting with another person; Doing something illegal in the neighbourhood like selling drugs. Cronbach's alpha=0.81
Neighbourhood safety	14 items measuring perceived safety in the neighbourhoods on a 4-point scale from not true at all to very true: There are a lot of safe places where people my age can spend time outdoors in my neighbourhood; Every few weeks, an adolescent or adult in my neighbourhood gets beaten up or mugged; Every few weeks, some adult in my neighbourhood gets beaten up or mugged; I have seen people using or selling drugs in my neighbourhood; In the morning or later in the day, I have often seen drunk people on the streets in my neighbourhood; Most adults in my neighbourhood respect the law; I feel safe when I walk in my neighbourhood during the day; People in my neighbourhood often damage or steal each other's property; I feel safe walking in my neighbourhood by myself at night; Boys or girls are often harassed or called names in my neighbourhood; There are places that are safe for boys your age to spend time together or do activities together; There are places that are safe for girls your age to spend time together or do activities together; Crime and violence are a problem; Traffic accidents are a problem for our people. Cronbach's alpha=0.71
Gender norms	
Sexual double standards	12 items measured on a 5-point Likert scale from agree a lot to disagree a lot: Girls your age often get into "trouble" when they have boyfriends; Girls who have boyfriends are irresponsible; Boys like girls who wear revealing clothes; Girls are the victims of rumours if they have boyfriends; Boys tell girls they love them when they don't; Adolescent girls should avoid boys because they trick them into having sex; Boys have girlfriends to show off to their friends; Boys generally compete for the prettiest girls; Boys feel they should have girlfriends because their friends do; Adolescent boys lose interest in a girl after they have sex with her; It's normal for a girl to want a boyfriend at your age; Adolescent boys fool girls into having sex. Cronbach's alpha=0.88

Characteristics	Description of variable/question/statement and their values
Gender role attitudes	7 items measured on a 5-point Likert scale from agree a lot to disagree a lot: Girls who carry condoms on them are easy; Girls should be proud of their bodies as they become women; Boys and girls should be equally responsible for household chores; A woman's role is taking care of her home and family; A man should have the final word about decisions in the home; A woman should obey her husband in all matters; Men should be the ones who bring, money home for the family, not women. Cronbach's alpha=0.85
Stereotypical views about strength and weakness	9 items measured on a 5-point Likert scale from agree a lot to disagree a lot: Boys should be raised tough so they can overcome any difficulty in life; Girls should avoid raising their voice to be lady like; Boys should always defend themselves even if it means fighting; Girls are expected to be humble; Girls need their parents protection more than boys; Boys should be able to show their feelings without fear of being teased; Boys who behave like girls are considered weak; A boy should always have the final say about decisions with his girlfriend; It is important for boys to show they are tough even if they are nervous inside. Cronbach's alpha=0.84
Premarital sex permissiveness	4 items measured on a 5-point Likert scale from agree a lot to disagree a lot: It is ok for an adolescent girl to have sex as long as she avoids getting pregnant; In general, a girl should only have sex with someone she loves; It is ok for an adolescent boy to have sex as long as he avoids getting a girl pregnant; In general, a boy should only have sex with someone he loves. Cronbach's alpha=0.72
Heteronormative relationships	4 items measured on a 5-point Likert scale from agree a lot to disagree a lot: A boy should be able to have a girlfriend if he wants to; Boys have girlfriends for fun more than love; It's normal for a boy your age to want a girlfriend; A girl should be able to have a boyfriend if she wants to. Cronbach's alpha=0.72
Gender non-conformity	3 items measured on a 5-point Likert scale from agree a lot to disagree a lot: It is okay to tease a girl who acts like a boy; It is okay to tease a boy who acts like a girl; A real man should have as many female partners as he can. Cronbach's alpha=0.63
Empowerment	
Freedom of movement	6 items measured on a 4-point scale from never to often about how often respondent is allowed to meet or visit friends, attend religious meetings, go to after school activities or visit friends without an adult around. Cronbach's alpha=0.73
Voice	7 items measured on a 4-point scale from never to often on how often respondent gives opinions, advice, or speaks up when at home, in school or with peers. Cronbach's alpha=0.91
Decision-making	7 items measured on a 4-point scale from never to often about how often respondent makes decisions on their own about clothes they wear, activities during free time, what to eat when not at home, friendships or are likely to influence decision about when to leave school, marry and who to marry. Cronbach's alpha=0.79
Adversity	
Adverse Childhood Experiences (ACEs)	14 items measured on 3-point scale on whether respondent has ever had an ACE such as being scared because adults said mean things to them or said they didn't want them, scared of being hurt by parents or other adults, felt unloved or not cared about, felt unprotected, left on their own, parents drank too much alcohol/used drugs and were abusive, didn't have enough food, saw mother or father being hit/beaten/threatened, seen mother/father so sad, parents in jail; family forced to leave home; adult touched their private parts; adult ever attempted/forced you to them sex
Puberty and body comfort	
Pubertal maturation	Whether respondent has started experiencing pubertal changes: Girls - breasts growth, menstruation; Boys - Growth of beards, voice change, penis enlargement, wet-dreams. 1=Pre-pubertal; 2=Pubertal
Age at first menarche	Girls only: Age at first menstruation. Reported age ranged from 12 - 15

Characteristics	Description of variable/question/statement and their values
Sanitary product (last period)	Sanitary products used to manage last menstruation. 1=Tampon; 2=Disposable pads; 3=Reusable pads; 4=Menstrual cup; 5=Toilet paper; 6=Cotton wool; 7=Mattress; 8=Pieces of cloth
Menstrual period-related school absenteeism	Missed school during last period and reasons for missing school: 0=No; 1=Yes. Reasons for missing school: 1=Pain; 2=Lack sanitary products; 3=Traditional beliefs; 4=Menstrual associated; 5=Teasing/bullying
Feelings about menstruation	4 items measured on a 4-point scale from not true at all to very true: Ashamed of my body during periods; My period tells me I am a woman; Important to keep period secret; Proud of periods; 5)Periods not a big deal
Body comfort	8 items measuring a respondents feelings about body changes:1) On the whole I am satisfied with my body; 2) I worry about the way that my body looks; 3) I like the way I look; 4) I like looking at my body; 5) I often wish my body were different; 6) I am worried that my body is not developing normally; 7)I feel like I am beautiful; 8) I feel like I am handsome
Violence	
Witnessed verbal or physical abuse	Witnessing male or female peers bully/threaten someone or start a physical fight with someone in last 6 months. For each: 1=No; 2= Yes, to/with both boys and girls; 3=Yes, to/with girls; 4=Yes, to/with boys
Violence victimization	Experienced violence in last six months: Being touched in a way that you did not want, been teased or called names by someone, been slapped, hit or otherwise been physically hurt by a boy or girl. For each: 1=No; 2= Yes, by both boys and girls; 3=Yes, by girls; 4=Yes, by boys
Violence perpetration	Bullied or threatened another boy or girl for any reason, slapped, hit or otherwise physically hurt another boy or girl in the last six months. For each: 1=No; 2= Yes, to both boys and girls; 3=Yes, to girls; 4=Yes, to boys
Mental health (depressive symptoms)	6 items about self-reported depressive symptoms measured on 5-point scale from agree a lot to disagree a lot: In general, I see myself as a happy person; I blame myself when things go wrong; I worry for no good reason; I am so unhappy I can't sleep at night; I feel sad; I am so unhappy I think of harming myself
Alcohol and substance use	Ever drunk alcohol; Ever smoked cigarettes; Ever smoked marijuana Ever used illicit substances; Ever used any drugs that were not prescribed to treat an illness. For each: 0=No; 1=yes
Sexual health	
Sexual health knowledge: Pregnancy and pregnancy prevention	9 items: A girl can get pregnant the first time that she has sexual intercourse; A girl can get pregnant after kissing or hugging; A girl can swallow a pill every day to protect against pregnancy; Using a condom can protect against pregnancy; A girl can have a shot or injection that will protect against pregnancy; A girl can use herbs to prevent a pregnancy; A boy can get a girl pregnant before he has his first ejaculation; A boy can be fertile every day of the month; It's normal for a girl to have periods that don't come at the same time each month. For each 1=False; 2 Don't know; 3=True. Scores ranged from 6 to 25. Cronbach's alpha=0.86
Sexual health knowledge: HIV prevention and transmission	5 items: A boy/girl can get HIV the first time he/she has sexual intercourse; A girl or boy can swallow a pill before having sex that will protect against HIV; Using a condom can protect against HIV; You can get HIV through kissing; A girl or boy can take a pill every day to protect against HIV. For each 1=False; 2 Don't know; 3=True. Scores ranged from 1 to 15. Cronbach's alpha=0.76
Access to reproductive health services	4 items: Knows where to go for information about menstrual periods (girls only); Knows where to go to get condoms; Knows where to go to get family planning; knows where to get treatment for HIV/STI. Cronbach's alpha=0.77

Characteristics	Description of variable/question/statement and their values
Confidence seeking family planning	3 items: Feels too shy/embarrassed to go to a health facility for contraception; Feels too shy/embarrassed to get a condom if needed to prevent pregnancy; Thinks she/he would be treated well if in clinic, hospital or pharmacist for family planning. Cronbach's alpha=0.76
Sexual experience and attitudes	
Sexual history	Measured as ever experienced: Oral sex; Anal sex; Touched another boy or girl or been touched by someone in a sexual way; Spent time alone with someone you were in love with in private; Held hands with someone you were in love with; Hugged or cuddled with someone you were in love with; Kissed/been kissed by someone on the lips; Flirted with someone using phone, email, or social media; Sent a sexual picture of yourself to someone using phone, email or social media; Ever been in a romantic relationship. For each 1=yes; 0=No
Relationship status	I have never been in a romantic relationship; I am not currently in a romantic relationship, but I have had a boy/girlfriend in the past; I have more than one girlfriend; I have more than one boyfriend; I have a girlfriend; I have a boyfriend; I am engaged to be married to someone; I am married
Sexual attitudes	*A composite measure of sexual attitudes was derived from 4 items measured on a Likert scale of five categories ranging from agree a lot (5) to disagree a lot (1). The items were, "it's the girl's responsibility to prevent pregnancy"; "Girls who carry condoms on them are easy/loose"; "A real man should have as many female partners as he can"; "men are always ready for sex". The composite score ranges from 4 to 20, with four indicating positive sexual attitudes and 20 negative sexual attitudes. Cronbach's alpha=0.78
Sexual and reproductive health communication	Ever discussed the following topics with anyone: Sexual relationships; Pregnancy and how it occurs; Contraception; HIV/AIDs; How to take care of oneself during periods (girls) or when you start having wet dreams (boys)
Reproductive health information source and delivery	
Received reproductive health education in school setting	In which settings did you learn about these topics in the school? 1=classroom; 2=School clubs
	Who taught you about these reproductive health topics in the school? 1=School teacher; 2=Health provider; 3=Peer educator; 3=Religious person; 4=Mentor
Received reproductive health education outside school setting	In which settings did you learn about these topics outside the school? 1=Home; 2=Youth club; 3=Religious setting; 4=Health facility; 5=From a non-governmental organization; 6=Others
	Who taught you about these reproductive health topics outside the school? 1=Parent/caregiver; 2=School teacher; 3=Health provider; 4=Peer educator; 5=Religious person; 6=Mentors; 7=Others
Intimate partner violence	
Victimization	Partner ever: Thrown something at you; pushed, shoved, or grabbed you; Slapped you in the face or head; Hit/kicked you
Perpetration	Ever: Thrown something at partner; Pushed, shoved, or grabbed partner; Slapped partner in the face or head; Hit/kicked partner
Teacher survey	
Socio-demographic	
Sex	Sex of the respondent. 0=Female; 1=Male
Education	Highest level of education completed. 1=Secondary; 2=Tertiary (mid-level colleges) 3=University, 4 = Other

Characteristics	Description of variable/question/statement and their values
Religion	Religion of the respondent. 1=None; 2=Catholic; 3= Protestant; 4=Pentecostal/Charismatic = Other Christian; 5=Muslim; 6= Other
Position in school	An open-ended question about the teacher's current position at the school
Reproductive health education in school (RHE)	
Taught RHE	Ever taught RHE in the participating school? 0=No; 1=yes
RHE topics taught	1=Puberty/physical changes in body, 2=Reproductive organs, 3=Menstruation, 4=Sexual behavior, 5=Equality between men and women, 6=Gender equity, 7=Gender inclusion, 8=Gender policies, 9=Pregnancy and childbirth, 10=Abortion, 11=Contraceptive methods, 12=How to use contraceptive methods, 13=Where to get contraceptive methods, 14=Sex in exchange for money or gifts, 15=HIV/AIDS, 16=Other STIs, 17=Where to access STI/HIV services, 18=Communicating within relationships, 19=Decision-making skills, 20=Prevention of violence/sexual abuse, 21=Sexual orientation (homosexuality), 22=Sexual and reproductive rights, 23=Say no to sex/ Abstinence /Chilling, 24=Moral issues related to sexuality, 25=Positive living for young people living with HIV, 26=Female Genital Mutilation (FGM)
Gender attitudes	
Violence	6 items measured on a 3-point scale (agree, partially agree, do not agree): There are times when a woman deserves to be beaten; A woman should tolerate violence to keep her family together; It is alright for a man to beat his wife if she is unfaithful; A man can hit his wife if she won't have sex with him; If someone insults a man, he should defend his reputation with force if he has to; A man using violence against his wife is a private matter that shouldn't be discussed outside the couple. Cronbach's alpha=0.65
Sexual relationships	8 items measured on a 3-point scale (agree, partially agree, do not agree): It is the man who decides what type of sex to have; Men are always ready to have sex; Men need sex more than women do; A man needs other women even if things with his wife are fine; You don't talk about sex, you just do it; It disgusts me when I see a man acting like a woman; A woman should not initiate sex; A woman who has sex before she marries does not deserve respect. Cronbach's alpha=0.67
Reproductive health and disease prevention	5 items measured on a 3-point scale (agree, partially agree, do not agree): Women who carry condoms on them are easy; Men should be outraged if their wives ask them to use a condom; It is a woman's responsibility to avoid getting pregnant; Only when a woman has a child is she a real woman; A real man produces a male child. Cronbach's alpha=0.59
Domestic chores and daily life	5 items measured on a 3-point scale (agree, partially agree, do not agree): Changing diapers, giving a bath, and feeding kids is the mother's responsibility; A woman's role is taking care of her home and family; The husband should decide to buy the major household items; A man should have the final word about decisions in his home; A woman should obey her husband in all things. Cronbach's alpha=0.73
Rights and privileges of men	10 items measured on a 2-point scale (agree, disagree): It is important that sons have more education than daughters; Daughters should be sent to school only if they are not needed to help at home. The most important reason that sons should be more educated than daughters is so that they can better look after their parents when they are older; If there is a limited amount of money to pay for tutoring, it should be spent on sons first; A woman should take good care of her own children and not worry about other people's affairs; Women should leave politics to the men; A woman has to have a husband or sons or some other male kinsman to protect her; The only thing a woman can really rely on in her old age is her sons; A good woman never questions her husband's opinions, even if she is not sure she agrees with them; When it is a question of children's health, it is best to do whatever the father wants. Cronbach's alpha=0.63

Characteristics	Description of variable/question/statement and their values
Equity for girls	4 items measured on a 2-point scale (agree, disagree): Daughters should be able to work outside the home after they have children if they want to; Daughters should have just the same chance to work outside the homes as sons; Daughters should be told that an important reason not to have too many children is so they can work outside the home and earn money; I would like my daughter to be able to work outside the home so she can support herself if necessary. Cronbach's alpha=0.56
Head-teacher survey	
RHE taught in school	0=No; 1=yes
RHE delivery in schools	Are topics related to reproductive health education part of the national curriculum or are they taught as an extracurricular activity? 1=Only as part of the National Curriculum; 2=As an extra-curricular activity and as part of the National Curriculum; 3=Only as an extra-curricular activity
Standards for RHE delivery	Does this school follow any national or county level guidelines or standards for teaching topics related to reproductive health? A.=No, no standards or guidelines; B= Yes, national standards or guidelines; C= Yes, regional standards or guidelines; D=Yes, county standards or guidelines; E.=Yes, other standards or guidelines
RHE topics taught in school	A=Puberty/physical changes in body; B=Reproductive organs; C=Menstruation; D=Sexual behavior; E=Equality between men and women; F=Gender equity; G=Gender inclusion; H=Gender policies; I=Pregnancy and childbirth; J=Abortion; K=Contraceptive methods; L=How to use contraceptive methods; M=Where to get contraceptive methods; N=Sex in exchange for money or gifts; O=HIV/AIDS; P=Other STIs; Q=Where to access STI/HIV services; R=Communicating within relationships; S=Decision-making skills; T=Prevention of violence/sexual abuse; U=Sexual orientation (homosexuality), V=Sexual and reproductive rights; W=Say no to sex/ Abstinence /Chilling; X=Moral issues related to sexuality; Y=Positive living for young people living with HIV; Z=Female Genital Mutilation (FGM)
Teaching RHE	Who teaches reproductive health education at this school? A=Class teacher; B=Health education teacher; C=Science teacher; D= Other subject teacher; E=School nurse; F=Independent/guest reproductive health education teacher
Subject integration	Into what subjects are topics related to reproductive health integrated in this school? A=English; B=Kiswahili; C=Mathematics; D=Science; E=Social studies; F=Religious education; G=Creative arts; H=Physical education; I=Life skills; X=Other subjects (specify)
School grades where RHE is taught	In which class(es) are topics related to reproductive health taught in this school? A.=Standard 1; B=Standard 2; C.=Standard 3; D.=Standard 4; E=Standard 5; F=Standard 6; G=Standard 7; H=Standard 8
Prohibited RHE topics	A=Puberty/physical changes in body; B=Reproductive organs; C=Menstruation; D=Sexual behavior; E=Equality between men and women; F=Gender equity; G=Gender inclusion; H=Gender policies; I=Pregnancy and childbirth; J=Abortion; K=Contraceptive methods; L=How to use contraceptive methods; M=Where to get contraceptive methods; N=Sex in exchange for money or gifts; O=HIV/AIDS; P=Other STIs; Q=Where to access STI/HIV services; R=Communicating within relationships; S=Decision-making skills; T=Prevention of violence/sexual abuse; U=Sexual orientation (homosexuality), V=Sexual and reproductive rights; W=Say no to sex/ Abstinence /Chilling; X=Moral issues related to sexuality; Y=Positive living for young people living with HIV; Z=Female Genital Mutilation (FGM)

Addendum: Implications of COVID-19 pandemic on the project design

This baseline report represents the project's design at conception which consisted of three phases: formative, intervention and evaluation. However, the COVID-19 pandemic destabilized the project activities. The first case of COVID-19 was confirmed in Kenya on March 12, 2020 and the government immediately instituted measures to control the spread of the disease. Among these measures was the closure of all schools and colleges in Kenya, closure of places of worship, a ban on social gatherings, and the requirement to maintain social distancing when in public spaces, in addition to regular hand-washing and mask-wearing.

While the initial expectations were that schools would re-open in phases beginning September, 2020, the continued spread of the disease in the country saw the Ministry of Education announce in July that schools were likely to re-open in January 2021. This was conditional on the assumption that the Covid-19 infection curve will either

have flattened for Kenya or there would be substantial insights gained about the virus. This being a school-based study, the implications on the implementation of project activities were obvious which have necessitated some changes to the project design (as shown in the table below)

At the time of this report's publication, these proposed changes were under discussion with consortium partners in Burkina Faso and Nigeria who were facing similar challenges. Discussions were also being held with the Senior Programme Officer in-charge of the project at the International Development Research Centre (IDRC). Once the proposed changes are officially confirmed, permission to amend the protocol will be sought from the AMREF Health Africa Ethical and Scientific Review Committee (ESRC).

Activity	Initial design	Proposed changes
Interventions	School-based interventions targeting adolescents (eight sessions combining talks/lessons, discussions and participatory activities with adolescents) Community-based interventions targeting parents (to be delivered during parents-teachers meetings at school)	– A radio program targeting adolescents and parents. This is to be aired through a local radio station in the intervention site whose coverage is within a radius of 3 kilometres.
Intervention content and implementation protocols	– Co-designed with the community and structured to be delivered in schools	The content will not change, however, the delivery structure will change to suit a radio program
Second community dialogue meetings to review selected interventions and instruction methods to obtain community buy-in	Was to be held on March 28, 2020 with Community Advisory Committee (CAC), teachers, parents and adolescents. This was also an opportunity to seek community approval to roll-out the interventions	Plans to meet with select CAC members who are expected to reach out to community members In addition, a separate meeting with teachers of the initially proposed intervention school will be held Radio mentions prior to each planned session to mobilize the community to listen to proposed radio programs (see below)
Roll out of interventions	Community-based interventions were to begin in April, 2020 and school-based intervention in May, 2020, for a period of eight months (monthly sessions)	Expected to take place between October and December, 2020, for a period of two months (weekly sessions)
Evaluation of the project	Mixed methods assessment of the project. Quantitative survey with adolescents and teachers, Photo-voice activities with adolescents and teachers and focus group discussions with parents	Qualitative assessment of the project focusing on perceptions of the interventions and listener's experiences. Participants to be selected from those making contact with the radio station when the program is airing. Transcription of dialogues held during the radio show



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