Knowledge, uptake and patterns of contraception use among in-school adolescents in three South African townships: Baseline findings from the Girls Achieve Power (GAP Year) Trial [version 1; peer review: awaiting peer review]

Melanie Pleaner1, Alison Kutywayo1, Mags Beksinska2, Khuthala Mabetha1, Nicolette Naidoo1, Saiqa Mullick1

1Wits Reproductive Health and HIV Institute (Wits RHI), Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, Gauteng, 2193, South Africa
2MRU (MatCH Research Unit), Department of Obstetrics and Gynaecology, University of the Witwatersrand, Durban, Kwa zulu Natal, 4001, South Africa

Abstract

Background: South African adolescents experience barriers to sexual and reproductive health (SRH) knowledge and uptake. This study provides insight into contraceptive and other SRH service knowledge, perceptions, and uptake among adolescents in high HIV prevalence settings.

Methods: A baseline cross sectional survey was conducted among 3432 grade 8's enrolled into the Girls Achieve Power (GAP Year) trial from 26 public high schools across three South African townships (Soweto, Thembisa and Khayelitsha) (2017 - 2018). An interviewer-led survey collected information on SRH knowledge and perceptions; an audio computer-assisted self-interviewing technique gathered SRH service uptake. Descriptive analysis indicates frequency distribution of socio-demographics and knowledge, uptake and perceptions of SRH services. Chi-square test tested for associations between age and sex and selected variables that measure SRH knowledge and uptake.

Results: In total, 2383 learners, completed both survey components. Of these, 63.1% (n=1504) were female and 81.4% (n=1938) aged 12-14. Almost a fifth (18.3%, n=436) had ever had sex and less than 1% had accessed SRH services in the last year. Of the 157 females who had ever had sex, 50.9% had ever used contraception. Of those who had sex in the last three months, 59.0% reported using a contraceptive method. Condom use was inconsistent: almost all females said they had not used or could not remember if a condom was used at last sex.

Conclusion: This paper contributes to the evidence strengthening learner SRH education, including the national Integrated School
Health Programme. Key themes include the need for age-appropriate, differentiated comprehensive sexuality education (CSE) for the range of ages found in the same grade in South African schools. Education on different contraceptive methods, informed decision-making, and emergency contraception is key. School-based interventions should embrace integrated HIV, STI, and pregnancy prevention messages. Closer links with health services need to be constantly fostered and reinforced.

**Keywords**
Adolescents, Contraception Use, South Africa, SRH Knowledge, Uptake
Introduction

Globally, there has been significant focus on the potential dividends to be gained by investing in and prioritising adolescent health, including sexual and reproductive health (SRH) and HIV. Although great strides have been made since the SRH historical landmark - the International Conference on Population and Development (ICPD) in 1994 - there are still multiple challenges in accessible SRH service provision for adolescents resulting in poor health outcomes.

This is particularly so for adolescent girls and young women (AGYW) in sub-Saharan Africa, who continue to experience significant inequalities, challenges and unmet needs for SRH services, together with an associated increased risk of unintended pregnancies, HIV, STIs, complications related to early age pregnancy, and other SRH complications. In sub-Saharan Africa, more than 50% of rural AGYW aged 15–24 years, and 42% of those in urban areas have been pregnant before the age of 18, with one in five new HIV infections occurring in this age group, despite representing only 10% of the population. This is primarily attributed to limited information, barriers to access, constraints in exercising their SRH rights, lack of comprehensive programmes and service provision, and in many countries, framed by an unsupportive legislative and policy environment.

Although South Africa has progressive and enabling rights-based laws, policies, guidelines and programmes relating to SRH and young people, the challenges faced in relation to SRH and HIV mirrors similar trends in sub-Saharan Africa. In terms of HIV, 7% of young people age 15–24 are HIV-positive, with AGYW having a four times higher prevalence rate than their male counterparts (12% versus 3%). The most recent South African National HIV Prevalence, Incidence, Behaviour and Communication Survey (SABSSM V) provides insight into some of the most important drivers of HIV in young people in South Africa, including early sexual debut, age disparate sex, and condom use. In terms of sexual debut in young people who have had sex, 13.6% reported having had sex before the age of 15 years. More males (aged 15–24) reported this compared to females (13.6% males vs 7.6% females). This pattern has been consistent over the previous four surveys.

Teenage pregnancy and its consequences are an ongoing problem. The 2016 South African Demographic and Health Survey (SADHS) found that 15.6% of South African adolescent females aged 15–19 have had childbearing. Although adolescent pregnancy has been a major social and economic challenge in South Africa for decades, the prevalence of mostly unintended pregnancies among females aged 15–19 has remained unchanged for the last 20 years. The ramifications of unsupported teenage pregnancy are far reaching and have been well documented, and include early exiting from education, reduced opportunities in employment and further education, socioeconomic challenges, associated health risks for both the woman and the infant, increased vulnerability for STIs, HIV and gender-based violence, together with the need for social protection and support.

Contraceptive prevalence in sexually active adolescents aged 15–19 was 60.4% in the 2016 SADHS, with reliance primarily on injectables and male condoms. However consistency in condom use in this age group is poor leaving young women open to unintended pregnancy. Factors contributing to poor contraceptive uptake in adolescents are cross cutting and multi-fold, and include health inequalities, limited information on contraception knowledge, barriers to accessing services, challenges with regards continuation and correct use, and gender-based violence.

Knowledge about contraception and contraceptive options is low in South African youth, this pertains particularly to both long-acting reversible contraception and emergency contraception, where, for example, only 30.9% of 15–19-year-old females knew of intrauterine devices (IUD), and 36% of emergency contraception. A school-based study focusing on secondary school girls learners in grades 10 -12 showed that while there was awareness about methods, this information was superficial - 58% knew about condoms, 50% injections, 43% oral contraceptive pills, 40% female condom and 10% IUDs, and only 17% knew about emergency contraception, but did not know how to take them. Similarly, there was a lack of information about how to take oral contraceptive pills.

The need to use evidence to understand and design effective, responsive strategies to improve the provision of SRH services for AGYW, and more specifically, preventing teenage pregnancy and the promotion of contraception is now as urgent as ever. However, there is still a gap in research relating to adolescents’ use and knowledge of contraception and related services. This study seeks to contribute to the evidence and understanding of the factors influencing adolescent contraception uptake. To this end, we aim to gain insight into the knowledge and uptake of contraception among grade 8 adolescents in a high HIV prevalence setting and utilise the findings to guide interventions to improve access to SRH services, inform comprehensive sexual education (CSE) and strengthen strategies to prevent unintended pregnancies, within the framework of the Integrated School Health Programme (ISHP).

Methods

Study design and setting

This research is part of the GAP Year cluster randomized controlled trial (cRCT) conducted in 26 non-fee-paying high schools, in three peri-urban townships of South Africa: Khayelitsha (Western Cape Province), and Soweto and Tembisa (Gauteng Province). Half of the schools were randomised to the intervention study arm, whilst the other 13 were in the control arm. The aim was to assess school dropout and increase reporting of violence among adolescents as they progress in education. Schools were selected using the following inclusion criteria: mixed sex public high schools in in quintiles 1–3 which had not been exposed to any asset building interventions in the past six months. The exclusion criteria for the study were: single-sex

Quintile 1–3 schools are non-fee-paying schools, serving the poorest communities. Quintile 1 is the group of schools in each province catering for the poorest 20% of learners and receiving the highest allocation of Government funding per learner to support these poorer schools.
of the respondents as well as the knowledge, used to show the frequency distribution of the sociodemographic revealed in the datasets.

Study population
All grade 8 adolescents at selected schools, irrespective of age, sex or race, were invited to participate. The grade 8 learner age range is approximately 12–14 years however due to learners repeating grades and other reasons, the age range is commonly wider with older learners enrolled up to 18 years.

Sample size justification
The sample size was computed using cluster-randomized size methodology, suggested by Hayes and Bennett, based on the study’s primary outcome measures, (school dropout and increased reporting of GBV among adolescent girls). The effect size of dropout was factored from other similar studies accounting for a large conservative and representative sample size to measure outcomes. Based on other local studies, it was hypothesized a reduction in drop-out rate from 17.8% as reported by Branson, Hofmeyr to less than 14% (estimated effect size of 20%), with an anticipated attrition rate of 5% per year based on a similar local study. These calculations resulted in an upper limit sample size of 2730 adolescent girls and 1850 boys to determine the association between intervention and control school’s dropout rate and GBV variables.

Measures
The baseline survey was comprised of two components: firstly, an interviewer-led questionnaire and secondly, an audio computer-assisted self-administered interview (ACASI). The first section lasted between 45 minutes to 1 hour, providing information on the learners’ demographic and socio-economic characteristics, knowledge and attitudes pertaining to school safety, social support and social networks, sexuality, gender and norms, sexual reproductive health and rights (SRHR) and care-seeking behaviours. It was conducted by trained fieldworkers and captured directly on an android tablet, formatted with the Research Electronic Data Capture (REDCap) system. In the second section, learners were asked sensitive questions regarding their actual practices and behaviour, including questions on uptake of health care services, contraceptive use, sexual debut and relationships. This section lasted 20–30 minutes and was administered using the Audio Computer Assisted Self-interviewing (ACASI) method, seeking to reduce social desirability bias, and later exported into the REDCap online system. The survey was developed in English and back translated into Xhosa (a commonly spoken language at one site) and then pre-tested among selected learners for comprehension. Following data collection, learners were assigned unique person identifiers. As such, names and other personal information of the learners were not revealed in the datasets.

The data were analysed at two levels. Descriptive analysis was used to show the frequency distribution of the sociodemographic characteristics of the respondents as well as the knowledge, uptake and perceptions of sexual and reproductive health services. At the bivariate level, a chi-square test of association was employed to test for an association between age and sex categories and selected variables that measure sexual and reproductive health.

Data management and analysis
The tablets that were used to collect data utilised password-protected mechanisms to protect the data and the synced data was stored on Wits RHI secured servers. All the data from the REDCap and ACASI systems was exported into Stata for analysis. At the univariate level, descriptive frequency tables were used to describe the socio-demographic characteristics of the learners by age and sex. At the bivariate level, variables measuring knowledge, uptake and perceptions around SRH were assessed to examine their association with both sex and age category. Learners’ age was presented in groups (12–14 years and 15–18 years), this is because the 15–18-year age group represent a group that are older than the standard age appropriate range for that grade. They comprised of those who have repeated or skipped a year of schooling or started school later. They may represent a more vulnerable group whose education has been affected by social or economic circumstances. It should be noted that the “no” category has been removed for all dichotomous variables [variables with a Yes or No Response] shown in the results tables.

Ethical approval and considerations
The study was approved by the University of the Witwatersrand Human Research Ethics Committee (#M160940) in September 2016. The study was also approved by the provincial research committees of the Western Cape and Gauteng Departments of Health and of Education. This was followed by the schools’ approval and written parental informed consent and learner assent. The participating schools, parents and learners were fully informed about the voluntary nature of participation in the study, and of the confidentiality of data management. All data collection was supervised by the research team. Interviewer environments were set up to ensure confidentiality. Where feasible, interviewers were the same sex as the learner. Learners could stop the interview process at any time and were free to refuse to respond to any question(s) they felt uncomfortable answering. Social workers were employed to provide psychosocial support to learners during data collection and study intervention and a social harm form was developed to facilitate prompt referrals, where needed. The Good Participation Practice Framework was adapted and adopted in the GAP Year trial to guide stakeholder engagement throughout the lifecycle.

Results
As previously reported, overall, 3432 eligible learners across 26 schools participated in the baseline survey; we included 2383 in the analysis who completed both sections of the survey. In some cases, due to lack of time, learners were unable to complete both components and were excluded from this analysis.

Table 1 provides the socio-demographic characteristics of learners, by sex and age group. As previously reported, of the
2383 learners, 63.1% (n=1504) were female and the majority were Black African (96.9%, n=2309). Overall, Gauteng province represented just over half of all learners (53.6%, n=1278), with more males than females (57.0% vs 51.7%, p=0.012). Almost one in five learners (18.1%, n=433) in grade 8 were older than 14 years with 5.1% 16 years and older. Under half of all learners (41.4%, n=967) reported living with both parents. Over two thirds of learners’ parents/guardians’ households were receiving government grants (67.3%, n=1498).

Just over half of learners (51.4% n=1224) reported that they were dating or in a relationship. Almost a fifth (18.3%, n=436) had ever had sex, with significant group differences by age group and sex (p=0.001). While fifteen percent of those aged 12–14 years reported ever having sex, this more than doubled (32.7%) in the 15–18 year olds. Almost two-thirds (62.8%) were aged 11–14 years when they first had sex.

Knowledge, uptake and perceptions of sexual and reproductive health services

Table 2 outlines knowledge, uptake and perceptions of SRH services, by sex and age group. Over two thirds of learners (66.8%, n=1557) perceived that they have a right to access health care without being discriminated or stigmatized by health workers: this was similar among males and females.
Table 2. Knowledge, uptake and perceptions of sexual and reproductive health services, by sex and age category.

<table>
<thead>
<tr>
<th></th>
<th>Sex</th>
<th>Age groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female (n=1504) % (n)</td>
<td>Male (n= 879) % (n)</td>
<td>12–14 (n = 1938) % (n)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12–14</td>
</tr>
<tr>
<td>Have a right to access healthcare without being discriminated or stigmatized by a health worker (n=2332)</td>
<td>65.2 (965) 69.5 (592)</td>
<td>&lt; 0.001</td>
<td>66.8 (1269) 66.4 (287)</td>
</tr>
<tr>
<td>Ever participated in an SRH programme (n=781)</td>
<td>37.8 (557) 26.3 (224)</td>
<td>&lt; 0.001</td>
<td>32.5 (615) 38.3 (165)</td>
</tr>
<tr>
<td>Place where you participated in this programme (n=777)</td>
<td></td>
<td>&lt; 0.001</td>
<td>0.285</td>
</tr>
<tr>
<td></td>
<td>School</td>
<td>75.0 (415) 71.0 (159)</td>
<td>74.5 (455) 71.5 (118)</td>
</tr>
<tr>
<td></td>
<td>Church</td>
<td>12.5 (69) 25.0 (56)</td>
<td>15.2 (93) 19.4 (32)</td>
</tr>
<tr>
<td></td>
<td>Private organisation</td>
<td>9.6 (53) 0.4 (1)</td>
<td>7.5 (46) 4.8 (8)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>2.9 (16) 3.6 (8)</td>
<td>2.8 (17) 4.2 (7)</td>
</tr>
<tr>
<td>Participated in a SRH programme in last 2 years (n=781)</td>
<td>36.8 (205) 36.6 (82)</td>
<td>0.959</td>
<td>35.8 (220) 40.0 (66)</td>
</tr>
<tr>
<td>Know of a place in community where young people can find out about SRHR (n=2335)</td>
<td>30.9 (455) 32.2 (277)</td>
<td>0.184</td>
<td>29.6 (561) 39.2 (171)</td>
</tr>
<tr>
<td>Accessed health care in the last year (n=2337)</td>
<td>56.6 (836) 59.5 (512)</td>
<td>0.166</td>
<td>58.4 (1108) 54.8 (239)</td>
</tr>
<tr>
<td>SRH Health services required</td>
<td>0.7 (17) 0.5 (12)</td>
<td>0.5 (20) 1.0 (9)</td>
<td>0.7 (29)</td>
</tr>
<tr>
<td>Sexually transmitted infections (STIs)</td>
<td>0.5 (11) 0.5 (13)</td>
<td>0.4 (17) 0.8 (7)</td>
<td>0.4 (24)</td>
</tr>
<tr>
<td>HIV testing services (HTS)</td>
<td>1.2 (29) N/A</td>
<td>1.0 (19) 2.3 (10)</td>
<td>1.6 (29)</td>
</tr>
<tr>
<td>Pregnancy test</td>
<td>2.6 (61) 0.4 (10)</td>
<td>1.1 (44) 3.0 (27)</td>
<td>2.1 (71)</td>
</tr>
<tr>
<td>Contraceptives</td>
<td>3.9 (88) 4.6 (105)</td>
<td>4.1 (158) 3.9 (35)</td>
<td>4.0 (193)</td>
</tr>
<tr>
<td>Injury</td>
<td>36.5 (789) 23.2 (461)</td>
<td>27.4 (1061) 21.2 (189)</td>
<td>24.3 (1250)</td>
</tr>
<tr>
<td>Non-SRH Services</td>
<td>26.2 (16) N/A</td>
<td>27.8 (10) 24.0 (6)</td>
<td>0.741</td>
</tr>
<tr>
<td>Health care site accessed at last visit (n=1345)</td>
<td>3.6 (30) 1.8 (9)</td>
<td>2.6 (29) 4.2 (10)</td>
<td>0.464</td>
</tr>
<tr>
<td>Youth clinic</td>
<td>6.0 (50) 9.0 (46)</td>
<td>7.2 (79) 7.1 (17)</td>
<td>7.1 (96)</td>
</tr>
<tr>
<td>Private clinic/ hospital</td>
<td>89.6 (748) 87.7 (447)</td>
<td>89.2 (986) 87.0 (208)</td>
<td>88.9 (1195)</td>
</tr>
<tr>
<td>Government/ public clinic</td>
<td>0.8 (7) 1.7 (8)</td>
<td>1.0 (11) 1.7 (4)</td>
<td>1.1 (15)</td>
</tr>
<tr>
<td>Other</td>
<td>34.7 (426) 46.6 (233)</td>
<td>0.072</td>
<td>51.4 (559) 42.1 (99)</td>
</tr>
<tr>
<td>Felt comfortable to ask questions at my last visit (n=1324)</td>
<td>48.2 (391) 47.5 (234)</td>
<td>0.793</td>
<td>49.5 (529) 40.4 (95)</td>
</tr>
<tr>
<td>Questions asked at last consultation were answered adequately (n=1304)</td>
<td>34.7 (283) 31.9 (159)</td>
<td>0.294</td>
<td>33.1 (356) 35.9 (85)</td>
</tr>
<tr>
<td>Enough confidentiality at last visit (1315)</td>
<td>26.2 (16) N/A</td>
<td>27.8 (10) 24.0 (6)</td>
<td>0.741</td>
</tr>
<tr>
<td>Requested contraceptive services at last visit</td>
<td>58.1 (874) 58.3 (746)</td>
<td>56.7 (127) 58.1 (873)</td>
<td></td>
</tr>
</tbody>
</table>
A third (33.6%, n=781) had ever participated in an SRH programme in the past 2 years†, with males (p<0.001) and those aged 12–14 years (p=0.006) more likely to have participated than females and those 15–18 years. Almost three-quarters participated in the SRH programme in their school. Far fewer had participated in an SRH programme in the last two years (12.0%, n=287).

Less than a third of all learners knew of a place in their community where they could access SRH information, with older adolescents (15–18 years) more likely to know where to access this information (39.2% vs 29.6%, p=0.001).

Over half of learners (57.7%, n=1348) had accessed healthcare in the past year, with most requiring non-SRH services. Less than 1.0% accessed HIV or STI services, and a small number (2.1%, n=71) accessed contraception. Most learners used public health clinics (88.9%, n=1195). During their last healthcare visit, almost half (49.8%, n=659) felt comfortable enough to ask questions, with 47.9% (n=625) having their questions answered adequately. In relation to rights, only one third (33.6%, n=442) felt there was enough confidentiality during their last visit. The main source of SRH and rights education in females were school teachers (58.1%, n=873) and mothers (38.9%, n=585).

### Uptake and patterns of contraceptive use in females

Table 3 reports on contraceptive history and current use in females who had ever had sex. Males are not presented as most were unsure about method use their partner may have used/was currently using. Half (51.0%, n=80) who had ever had sex, had ever used a contraceptive method. The injection and condoms were the most common method ever used in the 12–14 age group. In the 15–18 age group almost all (96.4%, n=27) had ever used the injection. Sixty-five females were current contraceptive users although 29 of these had not had sex in the last three months.

Of the 157 females who had ever had sex, 41.2% (n=61) reported having sex in the last three months. Of these 59% (n=36) reported current contraceptive use with two-thirds (69.4%, n=25) using the injection while a quarter (25.0%, n=9) using the condom. Almost half of the injectable users mentioned using condoms as an additional method but not one of these or the condom only group reported use of a condom at last sex. Most knew condoms could prevent HIV and STIs. A small proportion mentioned hormonal methods (implants, injections and oral pills) could prevent HIV and STIs. Similarly, a small number (2.8%) mentioned the vaginal ring.

Of the 80 who had ever used contraceptives, only two said it was their decision to start using a method. Sixty said it was their parents/guardians who made the decision for them, while 18 did not say who had made the decision. None of the females who

<table>
<thead>
<tr>
<th></th>
<th>Female (n=1504) % (n)</th>
<th>Male (n = 879) % (n)</th>
<th>P-value</th>
<th>12–14 (n = 1938) % (n)</th>
<th>15–18 (n =443) % (n)</th>
<th>P-value</th>
<th>Total (n=2383) % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td>38.9 (585)</td>
<td></td>
<td></td>
<td>40.0 (512)</td>
<td>32.6 (73)</td>
<td></td>
<td>38.9 (585)</td>
</tr>
<tr>
<td>Television</td>
<td>12.2 (183)</td>
<td></td>
<td></td>
<td>12.7 (162)</td>
<td>9.4 (21)</td>
<td></td>
<td>12.2 (183)</td>
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<tr>
<td>Friends</td>
<td>10.6 (150)</td>
<td></td>
<td></td>
<td>10.2 (131)</td>
<td>13.0 (29)</td>
<td></td>
<td>10.6 (160)</td>
</tr>
<tr>
<td>Sister</td>
<td>10.4 (157)</td>
<td></td>
<td></td>
<td>9.9 (127)</td>
<td>13.4 (30)</td>
<td></td>
<td>10.4 (157)</td>
</tr>
<tr>
<td>Other family members</td>
<td>9.6 (144)</td>
<td></td>
<td></td>
<td>9.5 (121)</td>
<td>10.3 (23)</td>
<td></td>
<td>9.6 (144)</td>
</tr>
<tr>
<td>Books/ magazines</td>
<td>7.2 (108)</td>
<td></td>
<td></td>
<td>7.7 (99)</td>
<td>4.0 (9)</td>
<td></td>
<td>7.2 (108)</td>
</tr>
<tr>
<td>Healthcare workers</td>
<td>6.5 (97)</td>
<td></td>
<td></td>
<td>6.4 (82)</td>
<td>6.7 (15)</td>
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<td>6.5 (97)</td>
</tr>
<tr>
<td>Radio</td>
<td>4.6 (70)</td>
<td></td>
<td></td>
<td>4.8 (61)</td>
<td>4.0 (9)</td>
<td></td>
<td>4.6 (70)</td>
</tr>
<tr>
<td>Father</td>
<td>3.5 (53)</td>
<td></td>
<td></td>
<td>3.4 (44)</td>
<td>4.0 (9)</td>
<td></td>
<td>3.5 (53)</td>
</tr>
<tr>
<td>Online</td>
<td>3.5 (53)</td>
<td></td>
<td></td>
<td>3.8 (49)</td>
<td>1.8 (4)</td>
<td></td>
<td>3.5 (53)</td>
</tr>
<tr>
<td>Films / videos</td>
<td>2.1 (31)</td>
<td></td>
<td></td>
<td>2.4 (31)</td>
<td>0.0 (0)</td>
<td></td>
<td>2.1 (31)</td>
</tr>
<tr>
<td>Brother</td>
<td>1.7 (25)</td>
<td></td>
<td></td>
<td>1.6 (21)</td>
<td>1.8 (4)</td>
<td></td>
<td>1.7 (25)</td>
</tr>
<tr>
<td>Other</td>
<td>2.5 (44)</td>
<td></td>
<td></td>
<td>3.0 (38)</td>
<td>2.7 (6)</td>
<td></td>
<td>2.5 (44)</td>
</tr>
</tbody>
</table>

*Multiple choice question, not asked of males*
*Sexually active females included only*
| Table 3. Uptake and patterns of contraceptive use of females who have ever had sex, by age. |
|-----------------------------------------------|------------------------------------------------|----------------|----------------|
|                                               | 12–14 (n=109) % (n) | 15–18 (n = 48) % (n) | P-value | Total % (n) |
| **Ever used contraceptives**                  |                     |                   |         |             |
| Injection                                     | 63.3 (31)           | 96.4 (27)         | 0.116   | 75.3 (58)   |
| Condoms                                       | 59.2 (29)           | 21.4 (6)          | 45.4 (35)|             |
| Pill                                          | 4.1 (2)             | 7.1 (2)           | 5.2 (4) |             |
| Emergency contraceptives                      | 2.0 (1)             | 3.6 (1)           | 2.6 (2) |             |
| Implant                                       | 4.1 (2)             | 0.0 (0)           | 2.6 (2) |             |
| Vaginal ring                                  | 2.0 (1)             | 0.0 (0)           | 1.3 (1) |             |
| Intrauterine Device (IUD)                     | 2.0 (1)             | 0.0 (0)           | 1.3 (1) |             |
| Thigh sex                                     | 2.0 (1)             | 0.0 (0)           | 1.3 (1) |             |
| Withdrawal                                    | 2.0 (1)             | 0.0 (0)           | 1.3 (1) |             |
| **Sexually active in last three months (N=61)**|                     |                   |         |             |
| Condoms                                       | 69.6 (16)           | 38.5 (5)          | 58.3 (21)|             |
| Injection                                     | 56.5 (13)           | 92.3 (12)         | 69.4 (25)|             |
| Implant                                       | 4.3 (1)             | 0.0 (0)           | 2.8 (1) |             |
| Intrauterine device (IUD)                     | 0.0 (0)             | 7.7 (1)           | 2.8 (1) |             |
| Emergency contraception                       | 0.0 (0)             | 7.7 (1)           | 2.8 (1) |             |
| Dual method                                   | 40.8 (7)            | 25.8 (5)          | 33.3 (12)|             |
| **Condom use at last sex**                    |                     |                   |         |             |
| No                                            | 0.0 (0)             | 0.0 (0)           | 0.0 (0) |             |
| Can't remember                                | 22.5 (9)            | 14.3 (3)          | 19.7 (12)|             |
| Know that condoms can prevent HIV and STIs    | 84.4 (38)           | 92.6 (25)         | 87.5 (63)|             |
| It was my choice to start using contraception | 2.5 (1)             | 4.5 (1)           | 0.633   | 3.2 (2)     |
| If no, who made the decision for you (n=80)   |                     |                   |         |             |
| Parents                                       | 100.0 (39)          | 100.0 (21)        | -       | 100.0 (60)  |
| Ever discussed contraception with my partner  | 0.0 (0)             | 0.0 (0)           | -       | 0.0 (0)     |
| Method used (Self/partner) to prevent pregnancy and STIs at first sex (n=157) | 56.3 (58) | 55.6 (25) | 0.895 | 56.1 (83) |
| Knowledge of where to get contraceptives (n=157) | 82.4 (89) | 83.3 (40) | 0.888 | 82.7 (129)|
| Can obtain contraception without my parents' permission (n=157) | 27.4 (29) | 22.9 (11) | 0.766 | 26.0 (40)|

*Multiple choice

**Condoms only or hormonal method and condoms

18 missing responses
had ever had sex had ever discussed contraception with their partner.

At the first sexual encounter, just over half (56.1%, n=83) did something to prevent pregnancy, HIV or sexually transmitted infections. Most (82.7%, n=129) knew where to get contraceptives but fewer (26.0%, n=40) knew that they could get contraceptives without their parents’ permission.

Of the 80 females who have ever had sex and ever used a contraceptive method, the majority got the method from a public/government clinic (33.8%, n=26), followed by a private clinic (23.4%, n=18), pharmacy (10.4%, n=8), corner shop (6.5%, n=5), and friend (5.2%, n=4), while some did not say where they had obtained their method. Of those who reported they had never had sex, a small proportion reported using a contraceptive method.

Five females, of the 157 who had ever had sex, had ever been pregnant (0.3%, n=5): two got pregnant at 14 years, one at 15 years and two at 16 years (p=0.001). Of those who had ever been pregnant, two were pregnant at the time of the survey, one had terminated the pregnancy and two had gone on to have a live birth.

Discussion
We set out to explore adolescent experience with SRH service knowledge and uptake, in particular contraception in three peri-urban settings in South Africa. The learner age profile confirmed what has been reported in other South African studies - that a considerable proportion are above the standard expected age for the grade43. These learners are known to experience a number of challenges40,41, and may be missing out on age-appropriate school-based comprehensive sexuality education (CSE) which would be received if they were in a higher grade.

Although over half the learners reported having accessed healthcare services in the last year, very few reported accessing SRH services specifically, and less than 5% attended a dedicated youth service. Knowledge about HIV and SRH services and rights are important elements for promoting the sexual health and development of adolescents. We found that learners who had used healthcare services commonly experienced a lack of confidentiality and the ability to ask questions, and were concerned about discrimination, this was especially so for those who mentioned healthcare workers as their primary source of SRHR information. Addressing barriers to health care is an integral part of SRH promotion42, highlighting the need to improve young people’s experience of using health services which are cognisant of their rights.

Dismantling barriers, improving access, and developing effective responses to adolescent SRH and contraceptive programming is vital and there is a growing body of literature attempting to assess and define effectiveness of programmes42,43. Studies show that high impact interventions include improved access to youth friendly services40, school-based interventions45, and in particular well designed, and age-appropriate CSE46,47, with an emphasis on focusing on early adolescents, where patterns of behaviour are being formed47. In addition, the provision of quality, youth-friendly contraceptive services, sensitive to and responsive to the needs of young people is a fundamental requirement for promoting the SRH of young people42, as well as services that promote informed choice and decision-making, including long acting reversible contraception in the method mix42. A gap in programmes focussing on younger adolescents and the need to ensure that interventions include this cohort has been highlighted - for example, the Global Early Adolescent Study, which highlights the importance thereof in terms of shaping behaviour patterns, constructing gender norms, and paving the transition into older adolescence for both boys and girls48,49. In addition, the need for interventions targeting adolescent males as well has been underscored47.

School teachers and mothers were noted as the most common source of SRH information. This highlights two important priorities – to equip parents with the knowledge and skills to communicate effectively with their children about sex, as well as the need to provide teachers with the knowledge and skills to provide information, supported by comprehensive curricula and policies. Interventions focussing on parents have been shown to be constructive but neglected and should be included in programmatic interventions48,49. In South Africa, the Department of Education introduced scripted lesson plans in 2010 to strengthen the SRH content and standardize implementation of the Life Orientation Curriculum43. Despite the technical support school teachers received, including training on the delivery and content, no impact was observed on the primary outcomes of HIV knowledge, attitudes, condom use, pregnancy incidence, and genital herpes incidence45. These findings raise the issue of whether this was due to the programme being ineffectively designed or challenges with programme implementation and lack of programme fidelity45,46. Global evidence points to the potential benefits of CSE, if implemented adequately, in compliance with refined, evidence-guided criteria46,47. The National Integrated School Health Policy1 outlines what areas should be included in the school health package per learner phase. Contraception is included in the two senior phases from grade 9–12, however there are no further details or guidance given. The Standard Operating Procedures for the Provision of Sexual and Reproductive Health, Rights and Social Services in Secondary Schools5 outlines the need to counsel on the full range of available methods as laid out in the National Contraception Policy44.

In terms of sexual experience, over half of the learners were dating or in a relationship and just under a fifth, (18.3%) had ever had sex. Two-thirds had their first sexual experience between the ages 11–14 years, and a small number below this age. Of those who had had sex, many did nothing or did not remember if a method was used to prevent pregnancy, HIV or STIs during that first sexual encounter. The importance of programmes focussing on early adolescents is reinforced, including age appropriate SRH information be provided to ensure adolescents, including very young adolescents, are equipped with the knowledge.
around safe sexual practices, rights and gender awareness\textsuperscript{35,46}. Interestingly, learners reported that parents were commonly involved in their decision to use contraception – this is a potential area for further research.

There was similar contraceptive ever and current use in sexually active females to previously reported data in this age group\textsuperscript{11}. It was interesting to note that a number of females who had not had sex in the last three months reported that they were using a contraceptive method as were some who reported never having had sex. Although this was not probed in more detail, this may reflect an intention to have sex, or prevention in the event that they have sex. This, too, is an interesting trend to further research.

Contraceptive method use was similar to national surveys in South Africa with injectables and condoms as the main methods of contraception ever and currently used in sexually active learners\textsuperscript{1}. This is similar to other research among AGYW in South Africa\textsuperscript{9}, and highlights the need to promote other available contraceptive options, particularly the use of long-acting, reversible contraceptive methods which are both highly effective, do not rely on regular visits to the clinic, nor clients remembering to take them daily\textsuperscript{10}. The subdermal contraceptive implant, together with the IUD are an important part of the method choice offered to women and are supported by South Africa’s national contraceptive guidelines\textsuperscript{41}. Both are suitable for adolescents\textsuperscript{19}, and, together with short acting methods, form the basket of methods available to women in the public sector and need to be promoted\textsuperscript{40,42}. In addition, only two girls mentioned having ever used emergency contraception, and noting that only half who had had sex had ever used contraception, the need to promote emergency contraception is also an important, but underused option\textsuperscript{11}. The Standard Operating Procedures for the Provision of Sexual and Reproductive Health, Rights and Social Services in Secondary Schools\textsuperscript{12} clearly states the need to inform learners of emergency contraception and where it is available. These guidelines should be specifically targeted to educators involved in school SRH programme delivery.

There are several factors associated with contraceptive uptake, and these all need to be accompanied by strengthened adolescent and youth friendly services and improved outreach concerning available SRH and HIV prevention and services – for example, it was shown that some learners thought the hormonal contraception could prevent HIV and STIs, the majority of respondents reported not using protection at sexual debut, and a very low percentage used condoms at last sex. This calls for ongoing messaging concerning dual protection and the promotion of condom use and other HIV and STI prevention options, such as oral PrEP.

Knowledge, access to, and use of contraception plays a significant role in averting and decreasing millions of unintended pregnancies, births, abortions, and maternal deaths each year. Improving knowledge about contraception, including options, benefits, correct use, where and how to access reliable methods, what to do if a person has unprotected sex, as well as an understanding of their rights can help AGYW make informed decisions that can positively impact their SRH, education and psycho-social well-being\textsuperscript{39,38}.

This all serves to highlight the need for interventions that work across the ecological model - empowering individuals; promoting supportive relationships with sexual partners\textsuperscript{39}, parents, and peers and teachers and at the community level; ensuring societal norms are also addressed\textsuperscript{40,41}; as well as ensuring that this is framed by quality, accessible services, responsive to the needs of young people\textsuperscript{62}.

Strengths and limitations

There are strengths and limitations that should be considered when reviewing these findings. Conducted in 26 schools in three highly populated diverse townships of South Africa, this study can be generalised to other South Africa settings. However, the study was cross sectional therefore only representing one point in time. The final study sample size was less than originally planned however the results maintain power to draw these conclusions. There were many participants who didn’t complete both components of the survey which reduced the sample size when analysing specific variables. There was a higher proportion of learners aged 12–14 years in relation to those aged 15–18 years increasing power which results in these significant age differences: therefore, the results should be interpreted with caution given that the proportion of learners in these age groups is unbalanced. These limitations are unlikely to alter our primary findings.

Conclusion

This paper aimed to build on the body of evidence to guide school-based interventions to improve the SRH of school-going learners. Several key themes emerged. The need for age-appropriate, differentiated CSE to cater for the range of ages, and particularly for over-aged learners in South African schools was highlighted. The importance of school teachers and parents as the primary source of SRH information for learners requires an expanded, enhanced, programme to equip both teachers and parents to provide accurate, relevant and accessible information. The need for CSE to start with early grades was reinforced. The findings emphasise the importance of demand creation and outreach concerning method choice and emergency contraception, and for healthcare providers to encourage and enable informed decision-making. In addition, the paper reinforces the need for life orientation, life skills and CSE to deal with issues rooted in young people’s realities and sexual lives – such as communicating with sexual partners about safer sex, using protection at first sexual encounters (and thereafter) and the ongoing need to negotiate and use condoms. Finally, school-based interventions need to embrace integrated HIV, STI, and pregnancy prevention messages, and closer links with health services need to be constantly fostered and reinforced. These are transferrable insights and pave the way for enriching CSE and inform the implementation of expanded SRH and HIV prevention services – such as oral PrEP and other technologies into the future as well as the integration with other services.
Data availability

These data are comprised of aggregated survey responses, data codebooks and the survey tool. These data are available from:

Underlying data

This project contains the following underlying data, found at: "https://doi.org/10.7910/DVN/V6XMJ3"
- GAP Year_Quantitative SRH data

The following tools are found at: "https://doi.org/10.7910/DVN/AHHWNL"
- GAPYear_REDCap Codebook.pdf
- GAP Year_ACASI Boys Survey Codebook.pdf
- GAP Year_ACASI Girls Survey Codebook.pdf

Extended data

Harvard Dataverse: GAP Year_Violence REDCap and ACASI data, "https://doi.org/10.7910/DVN/AHHWNL"

This project contains the following extended data:
- GAP Year Boys ACASI Survey Questionnaire.pdf
- GAP Year Girls ACASI Survey Questionnaire.pdf
- GAP Year Boys REDCap Survey Questionnaire.pdf
- GAP Year Boys REDCap Survey Questionnaire.pdf

Data are available under the terms of the Creative Commons Zero “No rights reserved” data waiver (CC0 1.0 Public domain dedication).

Consent

Written informed consent for publication of the learner’s details obtained from the learners and their parents/guardian.

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