Knowledge, attitudes and peer influences related to pregnancy, sexual and reproductive health among adolescents using maternal health services in Ugu, KwaZulu-Natal, South Africa

Desiree Govender 1,2,3*, Saloshni Naidoo 2 and Myra Taylor 2

Abstract

Background: Knowledge and practices of sexual and reproductive healthcare is pivotal to the Safe Motherhood Initiative; however, only a few studies have investigated adolescent mothers’ knowledge of sexual and reproductive health in light of the above initiative. Research should thus focus on the knowledge and attitudes of adolescent girls as well as peer influences related to pregnancy and sexual and reproductive health among adolescents, as the findings may highlight vital health interventions that should be introduced. The aim of this study was thus to determine the knowledge, personal attitudes and peer influences related to pregnancy, sexual and reproductive health among adolescents who attended maternal health services in a district hospital in Ugu, KwaZulu-Natal, South Africa.

Methods: A cross-sectional study was conducted. Data were collected from 326 adolescents who accessed maternal health services in a peri-urban district hospital during June 2017 and November 2017. The questionnaire surveyed the knowledge, personal attitudes and peer influences related to pregnancy, sexual and reproductive health. The questionnaire was administered by fieldworkers using mobile devices powered by the Mobenzi Researcher® technology. The completed surveys were uploaded to the Mobenzi server where it was stored and aggregated. The data was analysed using R software.

Results: Of the 326 participants, 65 (19.9%) experienced repeat pregnancies in adolescence. Overall, only 143 (43.9%) of the participants answered 50% or more of the knowledge questions on pregnancy and HIV/AIDS and STIs correctly, while 183 (56.1%) answered less than 50% of the knowledge questions correctly. There was no relationship between knowledge of pregnancy and HIV/STIs and repeat adolescent pregnancies.

Conclusion: Adolescents’ knowledge of pregnancy and sexual and reproductive health was deficient as, even with repeat pregnancies, these adolescents were evidently no better informed about pregnancy and sexual and reproductive health. This suggests that social determinants, modes and platforms regarding the delivery of adolescent sexual and reproductive health education are important. An innovative mode to the delivery of sexual and reproductive health education includes the emerging digital platform. The digital platform encompasses social media, multimedia and mobile phones which is growing popular among young people.

Keywords: Adolescent pregnancy, HIV, Sexually transmitted infections, Safe motherhood initiative, Sexual and reproductive health

* Correspondence: desireegovender19@gmail.com
1 KwaZulu-Natal Department of Health, Durban, South Africa
2 School of Nursing and Public Health, Discipline of Public Health Medicine, University of KwaZulu-Natal, Durban, South Africa
Full list of author information is available at the end of the article
Background

Adolescence is a complex stage in life that is characterised by conflicts among responsibilities, independence and experimentation [1], and health and social problems may be extensive during this phase [2]. According to the World Health Organization, the main health issues among adolescents include early pregnancy, childbirth, HIV/AIDS, depression, violence, alcohol and drug abuse, intentional injuries, malnutrition, obesity, and tobacco use [3]. Adolescents account for 1.2 billion people globally and 11% of all births worldwide are to girls aged 15–19 years [4]. South Africa is home to approximately 9.68 million adolescents [5] and the adolescent pregnancy rate here is 47 births per 1000 females aged 15–19 per annum [6]. Adolescent pregnancy and childbirth are increasingly recognised as a serious, worldwide public health concern. The maternal mortality rate associated with pregnant adolescents has been attributed to pregnancy induced hypertension, HIV/AIDS, Tuberculosis, obstetric haemorrhaging, and medical and surgical disorders [6, 7]. The HIV prevalence in South Africa is estimated at 13.1% [5].

Sexual and reproductive health (SRH) programs are often not prioritised due to a lack of funding and the emphasis that is placed on community-based HIV prevention programmes [8]. There are also restrictive laws and policies concerning adolescent sexual and reproductive health [9]. Access to SRH in the Asia Pacific Region is dependent on age and the regulation of marital status [10, 11]. Customary and religious laws require persons under the age of 18 years to seek consent from parents or spouses to access SRH [10]. Healthcare providers may also be prohibited from delivering contraceptive services to unmarried persons [11]. The age that an adolescent is allowed to consent for sex often conflicts with the age that the adolescent is allowed to consent for medical interventions [10]. Thus, the blatant disregard of adolescent SRH often results in a damaging transition to adulthood [9]. Education and clinical services, which are the cornerstones of SRH, are essential in promoting positive sexual development and decreasing adverse social, economic and health outcomes associated with sexual behaviour [12]. Parents, teachers, healthcare providers and community leaders are the gatekeepers of adolescent sexual and reproductive health because they are responsible sources of SRH information and services for adolescents [13].

The Safe Motherhood Initiative was a key outcome of the first international Safe Motherhood Conference in Nairobi, Kenya, in 1987 [14]. The pillars of the Safe Motherhood Initiative include family planning, antenatal care, obstetric care, postnatal care, post abortion care and STI/HIV/AIDS control. The Safe Motherhood Initiative is founded on the principle of sound knowledge and practices of reproductive health; however, only a few studies have investigated adolescent mothers’ knowledge of sexual and reproductive health [14]. Universal access to SRH services is one of the specific targets of the Sustainable Development Goals pertaining to health (SDG3) [15]. Thus knowledge, personal attitude and peer influences can influence adolescents’ decision to access maternal, sexual and reproductive health services or not. However, far too little attention has been paid to the knowledge, personal attitudes and peer influences related to pregnancy, sexual and reproductive health among adolescent girls accessing maternal health services.

A lack of pregnancy related knowledge among pregnant adolescent girls can adversely affect their lives as well as those of their unborn children [16]. Therefore, adolescent pregnant women should be equipped with knowledge so that they will be able to engage in good health practices during pregnancy. They should also identify danger signs during pregnancy and make prompt decisions about appropriate care and support. The age and maturity level of pregnant women may impact their susceptibility to antenatal education and their ability to identify danger signs associated with their pregnancy [17]. However, knowledge of SRH and pregnancy among adolescents has remained inadequate [4], and therefore adolescent pregnancy is considered a high health risk as poor nutrition, limited knowledge, and ignorance of danger signs during pregnancy can be devastating.

This paper is an excerpt from a larger doctoral study that aims to develop a community of practice model for a multidisciplinary and comprehensive approach towards caring for pregnant and parenting adolescent mothers. This doctoral study is being conducted in Ugu, KwaZulu-Natal, South Africa. The purpose of this paper is to report the knowledge, personal attitudes and peer influences related to pregnancy, sexual and reproductive health among adolescents who utilised maternal health services in a district hospital in Ugu, KwaZulu-Natal, South Africa.

Methods

Study design and setting

A descriptive cross-sectional study design was used to assess the knowledge, attitudes and peer influences related to pregnancy, sexual and reproductive health among adolescents using maternal health services in the study site during June 2017 to November 2017. The target sample size of 326 participants were reached for the study. The study was conducted in a district hospital in Ugu, KwaZulu Natal. At the time of the study, the majority of the study population (84%) resided in rural areas whereas only 16% resided in the urban coastal strip. Generally, KwaZulu-Natal has the highest prevalence of HIV in pregnant women (44.4, 95% CI: 42.5–46.3%) among the South African provinces [18]. According to the South African
National Antenatal Sentinel HIV and Syphilis Prevalence Survey, HIV prevalence is 45.9% in the Ugu district [18].

**Study population and sampling**

The study population included adolescent girls aged 13–19 years manifesting first and repeat pregnancies and accessing the maternal health services at the district hospital. Convenience sampling was used to recruit these females. Adolescents with first and repeat pregnancies who attended the ante- and postnatal clinics were identified by the nurses and briefly informed about the study. The nursing staff was aware of the inclusion and exclusion criteria, which included the adolescents' cognitive abilities, and they recruited participants accordingly. The nursing staff used the questions from the modified mini mental state exam (MMSE) to determine the participants' cognitive function. The MMSE is a widely used measure of global cognitive function [19]. The questions in the MMSE with regards to the tests of orientation (time, place, person), registration and recall are used in the assessment of the maternity healthcare users at the institution. Interested participants were referred to the research assistants stationed in the clinic who then provided them with more details, after which they decided whether to participate voluntarily or not.

The sample size of 326 participants were determined for the study on the prevalence of adolescent repeat pregnancy at the study site. Details of the sample size calculation for the prevalence study has been described elsewhere. The eligibility criteria for participants were: 1) pregnant and postpartum adolescent girls aged 13–19 years, and 2) pregnant and postpartum adolescents under 18 years (but above 13 years) who had obtained permission from their parent/s or legal guardian/s to participate in the study. The exclusion criteria included: 1) pregnant and postpartum adolescents under 13 years of age; 2) pregnant and postpartum adolescents under 18 years of age who had not obtained permission from their parent/s or legal guardians to participate in the study; and 3) pregnant and postpartum adolescents with cognitive impairment. Parental or legal guardian consent for participants under the age of 18 years was stipulated by the Biomedical Research Ethics Committee, UKZN.

**Measurement instrument**

The Healthy Pregnancy Knowledge Survey (HPKS) questionnaire, which was developed by Godin et al. [20], was adapted for this study to measure the participants' knowledge related to pregnancy health. The HPKS questionnaire contained 25 questions relating to three major topics: healthy pregnancy, a healthy lifestyle, and breastfeeding. The questionnaire was originally piloted in thirty public health institutions in Ontario. Although the validity and reliability of the HPKS were not formally assessed, professionals and academics in the fields of public health and maternal and child health gave relevant and comprehensive input for the development of the HPKS. The questionnaire contained multiple choice questions and a ‘true’ and ‘false’ scale with a ‘do not know’ option. Knowledge and practices of sexual and reproductive healthcare included questions on: 1) HIV/AIDS and STIs; 2) sexual risk behaviour and prevention; 3) personal attitudes towards sexuality and reproduction; and 4) peer influences.

The questionnaire also included questions about topics that were taught in the Life Orientation curriculum at school (Additional file 1). A Life Skills programme was introduced in secondary schools in South Africa in 1996 to provide learners with comprehensive information on HIV/AIDS and STIs, reproduction, contraception, pregnancy, violence, decision making and sexual negotiation [21]. This programme has now been integrated into the Life Orientation curriculum. Life Orientation is a standardised subject in school that focuses on topics such as teenage pregnancy, contraception, STIs, HIV/AIDS, sexuality, and reproduction.

The South African Department of Basic Education [22] describes Life Orientation as “the study of the self in relation to others and to society. It addresses skills, knowledge and values about the self, the environment, responsible citizenship, a healthy and productive life, social engagement, recreation and physical activity, careers and career choices” (p.8). Life Orientation is an essential subject required for the National Senior Certificate and is thus a compulsory subject for all learners in Grades 10, 11 and 12 in South Africa.

The questionnaire was piloted among 25 pregnant adolescents by fieldworkers using mobile devices powered by Mobenzi Researcher® technology. The study site was the antenatal unit at the hospital where the current doctoral study is conducted. The aim of a pilot study was to establish the user friendliness of the questionnaire. A gynaecologist, a clinical midwife, a school health manager, a clinical psychologist and an adolescent and reproductive academic expert were consulted to establish the face and content validity of the questionnaire.

**Data collection**

Fieldworkers were recruited from the local community and received training on research ethics, the aims and objectives of the study, and mobile data collection. The questionnaire survey (measurement instrument) was administered by the fieldworkers using mobile cellular tablets powered by the Mobenzi Researcher® technology. The responses to the survey were obtained in mobile assisted face-to-face interviews between the fieldworkers and individual female adolescents. The interviews were conducted in safe, private settings within the ante- and postnatal units. Mobenzi Researcher®, which was developed in 2008 in
South Africa, is a platform for the mobile collection of baseline data. The software was installed on the handsets. The mobile application technology supports various question types and also allows for the marking of fields as ‘mandatory’ and ‘not applicable’. The completed surveys were uploaded to the Mobenzi survey where they were stored and aggregated.

Data analysis
The data from the research console were cleaned and exported into R software (R version 3.5.0. Vienna: R Foundation for Statistical Computing) for statistical analyses. Frequency distributions and summary statistics were used to describe the data. The percentage of adolescent girls who were able to answer 50% of the questions about pregnancy and HIV/AIDS/STI knowledge correctly was determined. A study conducted in Malaysia had used 50% as a cut-off score for reasonable knowledge of pregnancy and sexual and reproductive health [16]. The Fisher’s exact test was used to ascertain statistical significance of categorical variables while the Wilcoxon signed ranked test was used to perform comparisons between continuous variables. A univariate logistic regression model was constructed with adolescent repeat pregnancy as the outcome variable of interest. The main exposure of interest was whether or not the adolescent girls answered 50% of the pregnancy and HIV/AIDS/STI related questions correctly. A multivariate logistic regression model was created similar to the univariate logistic regression model, but it adjusted for age, education levels, and the mothers’ marital status. A p-value of 0.05 was considered statistically significant.

Results
Socio-demographic, obstetric, clinical characteristics and knowledge survey results
A total of 326 participants completed the questionnaire. The majority of the participants was in the age group 17–19 years (86.5%, n = 282). Of the 326 participants, 98.5% was single (Table 1). All the participants indicated that they had received formal education while 51.5% (n = 168) indicated that their biological mothers had received formal education. Most of the participants (97.5%, n = 318) were unemployed. Only 102 (31.0%) of the participants indicated that their biological mothers were married, while 147 (45.1%) stated that their biological mothers were single.

Of the 326 participants, 65 (19.9%) had experienced repeat pregnancies during their adolescent years and 28 (8.6%) of the participants admitted that they had experienced a spontaneous abortion. The clinical histories revealed that 23 (7.1%) of the participants had experienced pregnancy induced hypertension while 25 (7.7%) had experienced anaemia. The prevalence of HIV among the participants was 17.8% (n = 58).

| Variables | Frequencies (n) | Percentages (%) |
|-----------|----------------|-----------------|
| Age       |                |                 |
| 14–16     | 44             | 13.5%           |
| 17–19     | 282            | 86.5%           |
| Marital status of participants | | |
| Single    | 321            | 98.5%           |
| Married   | 5              | 1.5%            |
| Highest educational level | | |
| Primary    | 9              | 2.8%            |
| Junior     | 12             | 3.7%            |
| Secondary  | 305            | 93.6%           |
| Employment status of participants | | |
| Employed full time | 6              | 1.8%            |
| Employed part time | 2              | 0.6%            |
| Unemployed | 318            | 97.5%           |
| Family characteristics | | |
| Biological mother’s marital status | | |
| Single | 147            | 45.1%           |
| Married | 101            | 31%             |
| Other | 78             | 23.9%           |
| Educational level of biological mother | | |
| Primary school | 29             | 8.9%            |
| Junior secondary | 17             | 5.2%            |
| Senior secondary | 118            | 35.6%           |
| Technical school | 3              | 0.9%            |
| University degree | 3              | 0.9%            |
| None | 28             | 8.6%            |
| Do not know | 130            | 39.9%           |
| Obstetric history | | |
| Had an adolescent repeat pregnancy? | | |
| No | 261            | 80.1%           |
| Yes | 65             | 19.9%           |
| Number of spontaneous abortions | | |
| 0 | 298            | 91.4%           |
| 1 | 27             | 8.3%            |
| 2 | 1              | 0.3%            |
| Medical conditions | | |
| High blood pressure | 23             | 7.1%            |
| Anaemia | 25             | 7.7%            |
| HIV | 58             | 17.8%           |
| Answered knowledge questions correctly (Pregnancy, HIV/AIDS and STIs) | | |
| 50% or more questions correct | 143            | 43.9%           |
| Less than 50% correct | 183            | 56.1%           |

Table 1 Socio-demographic, obstetric, clinical characteristics and knowledge survey results (n = 326)
Life orientation
The participants were asked if HIV/AIDS, STIs, contraception, menstruation, male circumcision, teenage pregnancy, termination of pregnancy, abuse, depression and anxiety were covered in the Life Orientation curriculum when they attended school. Of the 326 participants, 129 (39.6%) stated that contraception was not covered in Life Orientation. Furthermore, 154 (47.2%) had not learnt about the termination of pregnancy in Life Orientation. Most participants, 77.9 and 72.9% respectively, stated that HIV/AIDS and STIs was covered in Life Orientation. When asked about adolescent pregnancy, 286 (87.7%) reported that this topic was covered in Life Orientation while only 164 (50.3%) reported that depression and anxiety were covered in the Life Orientation curriculum at school.

Miscellaneous general pregnancy and signs of preterm labour knowledge
A total of 303 (92.9%) correctly identified that a pregnant woman must consult her clinician (doctor or midwife/nurse) should she feel unwell, has a fever, and/or experiences an unusual physical change (Table 2). Less than half of the participants (44.2%, $n=144$) was able to correctly identify the advice that pregnant women should follow to decrease the risk of preterm labour. Only 116 (35.6%) knew that folic acid is essential for the baby’s brain and spine development. The most commonly identified signs of preterm labour were understood as cramps and abdominal pain (48.8%, $n=159$), the release of fluid or blood from the vagina (60.4%, $n=197$), and regular or frequent contractions or changes in the severity or number of contractions (33.7%, $n=110$) (Table 2). When questioned about what a pregnant woman should do in the event of preterm labour, most participants were able to correctly identify that a pregnant woman should contact the doctor (87.7%, $n=286$) or go to the hospital immediately (94.2%, $n=307$).

Normal symptoms during pregnancy
A total of 235 (72.1%) correctly identified that aches in the hips and back are a normal symptom during pregnancy. The results showed that 19 (5.8%) of the participants did not know that nausea was experienced during pregnancy. Only 143 (43.9%) and 76 (23.3%) correctly identified that an abnormal vaginal discharge and spectator vision were abnormal symptoms during pregnancy respectively.

Knowledge of anaemia
Most participants (63.2%, $n=206$) did not know that iron deficiency leads to anaemia. Less than half (43.3%, $n=141$) of the participants knew that anaemia can result in preterm delivery and low birth weight. When asked to identify the signs and symptoms of anaemia, only 15 (4.6%) were able to identify six out of thirteen signs and symptoms of anaemia. The majority of the participants (59.5%, $n=194$) was able to identify only one out of thirteen signs and symptoms of anaemia. The most commonly identified signs and symptoms of anaemia were pale skin (46.3%, $n=151$), pale lips (31.3%, $n=102$) and pale underside of the eyelids (31%, $n=101$).

Knowledge of alcohol and tobacco use during pregnancy
When assessing knowledge of alcohol use during pregnancy, most of the participants (92.5%, $n=302$) knew that no quantity of alcohol is safe during pregnancy (Table 3). Only 64 (19.6%) and 67 (20.6%) agreed that alcohol consumption results in low birth weight and heart defects respectively. Of the 326 participants, 209 (64.1%) knew that alcohol consumption can cause mental retardation in the unborn child. Few participants knew that tobacco use during pregnancy results in low birth weight (22.4%, $n=73$), spontaneous abortion (16.6%, $n=54$), preterm labour (6.7%, $n=22$), and foetal deformities in the uterus (16%, $n=52$).

Knowledge of activities that should be avoided during pregnancy
Less than half of the participants (42.9%, $n=140$) knew that the use of pesticides should be avoided during pregnancy. Only 41.1% (134) agreed that playing with cats is dangerous and 37% (121) knew that cleaning a cat’s litter box should be avoided during pregnancy. Only 20 (6.1%) of the participants knew that X-rays should be avoided during pregnancy.

Knowledge regarding breastfeeding
Most participants (71.8%, $n=234$) identified that 6 months is the recommended length of time for exclusive breastfeeding (Table 4). When assessing their knowledge about the benefits of breastfeeding, most participants correctly agreed that breast feeding improves the immunity of babies (78.8%, $n=257$), decreases the risk of obesity and diabetes (58.3%, $n=190$), and that breastfed babies have fewer dental cavities (59.2%, $n=193$). Furthermore, 200 (61.3%) knew that drugs and alcohol pass through breast milk.

Knowledge of HIV/AIDS and STIs
Only 72 (22.1%) of the participants knew that HIV can be transmitted via oral sex and 67 (20.6%) knew that anal sex transmits HIV (Table 5). Most participants correctly agreed that HIV infects and damages the CD4 cells (79.4%, $n=259$) and that HIV develops into AIDS (81.6%, $n=266$). Furthermore, 235 (72.1%) knew that HIV is present in semen, blood, vaginal secretions and breast milk. When asked to identify the signs and
| Questions                                                                 | Correct Answer | Frequencies (n) | Percentages (%) |
|--------------------------------------------------------------------------|----------------|-----------------|-----------------|
| A pregnant woman must consult a clinician (doctor or midwife/nurse)      | True           | 303             | 92.9%           |
| True                                                                      | 303            | 92.9%           |
| False                                                                    | 2              | 0.6%            |
| Do not know                                                              | 21             | 6.4%            |
| A pregnant woman must consult her clinician (doctor or midwife/nurse) in| True           | 301             | 92.3%           |
| the event that she feels unwell, has a fever, and/or experiences an     | True           | 301             | 92.3%           |
| unusual physical change.                                                 | False          | 2               | 0.6%            |
| Do not know                                                              | 23             | 7.1%            |
| To decrease the risk of preterm labour, a pregnant woman should:         | All of the     | 79              | 24.2%           |
| Attend antenatal care as soon as she knows she is pregnant              | All of the     | 79              | 24.2%           |
| Reduce stress                                                            | 20             | 6.1%            |
| Follow all the healthcare advice given by the doctor or midwife          | 15             | 4.6%            |
| Eat healthy, nutritious food                                             | 4              | 1.2%            |
| All of the above                                                         | 144            | 44.2%           |
| Do not know                                                              | 64             | 19.6%           |
| Folic acid is taken by pregnant women because it:                        | Is essential   | 116             | 35.6%           |
| Prevents nausea                                                          | 6              | 1.8%            |
| Is essential for the baby’s brain and spine development                 | 116            | 35.6%           |
| Prevents sexually transmitted infections                                 | 2              | 0.6%            |
| Helps with the baby’s lung development                                  | 6              | 1.8%            |
| Helps to reduce lower back pain                                          | 1              | 0.3%            |
| Do not know                                                              | 195            | 59.8%           |
| Pregnant women should avoid exercise.                                    | False          | 63              | 19.3%           |
| True                                                                     | 63             | 19.3%           |
| False                                                                    | 210            | 64.4%           |
| Do not know                                                              | 53             | 16.3%           |
| Signs of preterm labour                                                  | Yes            | 159             | 48.8%           |
| Persistent cramps and abdominal (stomach pain)                          | Yes            | 159             | 48.8%           |
| Yes                                                                      | 159            | 48.8%           |
| No                                                                       | 167            | 51.2%           |
| The release of fluid or blood from the vagina                           | Yes            | 197             | 60.4%           |
| Yes                                                                      | 197            | 60.4%           |
| No                                                                       | 129            | 39.6%           |
| Regular or frequent contractions or changes in the strength or number   | Yes            | 110             | 33.7%           |
| of contractions                                                          | Yes            | 110             | 33.7%           |
| Yes                                                                      | 110            | 33.7%           |
| No                                                                       | 216            | 66.3%           |
| A feeling as if the baby is pushing down                                 | Yes            | 99              | 30.4%           |
| Yes                                                                      | 99             | 30.4%           |
| No                                                                       | 227            | 69.6%           |
| Swollen ankles                                                           | No             | 24              | 7.4%            |
| Yes                                                                      | 24             | 7.4%            |
### Table 2 General knowledge pertaining to pregnancy and signs of preterm labour (N = 326) (Continued)

| Questions                                      | Correct Answer | Frequencies (n) | Percentages (%) |
|------------------------------------------------|----------------|-----------------|-----------------|
| No                                             |                | 302             | 92.6%           |
| Persistent cramps and abdominal (stomach pain) | Yes            | 159             | 48.8%           |
| Yes                                            |                | 167             | 51.2%           |

### Table 3 Knowledge regarding alcohol and tobacco use during pregnancy (N = 326)

| Questions                                                                 | Correct Answer                                    | Frequencies (n) | Percentages (%) |
|---------------------------------------------------------------------------|---------------------------------------------------|-----------------|-----------------|
| What quantity of alcohol may a pregnant woman consume?                    | No quantity of alcohol is safe during pregnancy.  | 302             | 92.6%           |
| 1 alcoholic drink a day                                                   | 1                                                 | 0.3%            |
| No quantity of alcohol is safe during pregnancy.                          | 302                                               | 92.6%           |
| Do not know                                                               | 23                                                | 2.1%            |
| Alcohol consumption during pregnancy results in low birth weight.         | Yes                                               | 64              | 19.6%           |
| Yes                                                                        | 64                                                | 19.6%           |
| No                                                                         | 262                                               | 80.4%           |
| Alcohol consumption during pregnancy results in heart defects.            | Yes                                               | 67              | 20.6%           |
| Yes                                                                        | 67                                                | 20.6%           |
| No                                                                         | 259                                               | 79.4%           |
| Alcohol consumption during pregnancy results in damage to the unborn baby's liver. | Yes                                             | 118             | 36.2%           |
| Yes                                                                        | 118                                               | 36.2%           |
| No                                                                         | 208                                               | 63.8%           |
| Alcohol consumption during pregnancy results in mental retardation in the unborn baby. | Yes                                             | 209             | 64.1%           |
| Yes                                                                        | 209                                               | 64.1%           |
| No                                                                         | 117                                               | 35.9%           |
| Smoking tobacco during pregnancy results in low birth weight.             | Yes                                               | 73              | 22.4%           |
| Yes                                                                        | 73                                                | 22.4%           |
| No                                                                         | 253                                               | 77.6%           |
| Smoking tobacco during pregnancy results in miscarriage.                  | Yes                                               | 54              | 16.6%           |
| Yes                                                                        | 54                                                | 16.6%           |
| No                                                                         | 272                                               | 83.4%           |
| Smoking tobacco during pregnancy results in preterm labour.               | Yes                                               | 22              | 6.7%            |
| Yes                                                                        | 22                                                | 6.7%            |
| No                                                                         | 304                                               | 93.3%           |
| Smoking tobacco during pregnancy results in deformities in the unborn baby. | Yes                                             | 52              | 16%             |
| Yes                                                                        | 52                                                | 16%             |
| No                                                                         | 274                                               | 84%             |
| No                                                                         | 2                                                 | 0.6%            |
| Smoking tobacco during pregnancy reduces back pain.                       | Yes                                               | 2               | 0.6%            |
| Yes                                                                        | 2                                                 | 0.6%            |
| No                                                                         | 324                                               | 99.4%           |
symptoms related to AIDS, overall, a large percentage of the participants was able to identify rapid weight loss (80.1%, n = 261), extreme weakness (75.2%, n = 245), chronic diarrhoea (62.6%, n = 204), white sores in the mouth (76.4%, n = 249), and sores in the genital region (66%, n = 215) as indicators.

A low percentage of participants was able to identify Gonorrhoea (24.5%, n = 80), Syphilis (15%, n = 49), Chlamydia (3.7%, n = 12) and Genital Herpes (15.6%, n = 51) as STIs (Table 5). However, when assessing the knowledge of the signs and symptoms of STIs, most participants were able to correctly identify genital sores (57.1%, n = 186), burning urination (54.9%, n = 179), discharge from the vagina (65.6%, n = 214), and discharge from the penis (59.8%, n = 195) as symptoms.

The common prevention methods for HIV and STIs that were identified included condom use (92.6%, n = 302), being faithful to one partner (63.8%, n = 208), and refusal to share needles (67.2%, n = 219). Only 163 (50%) agreed that abstaining from sexual intercourse can prevent HIV and STIs. Twenty-five (7.7%) participants incorrectly thought that birth control pills can prevent HIV and STIs. One hundred and five (66%) of the participants correctly agreed that all sexually active women must have an annual pap smear. Most participants (70.2%, n = 229) knew that a pregnant woman who is infected with HIV and STIs can transmit these diseases to her unborn child.

Table 4 Knowledge related to breastfeeding (N = 326)

| Questions                                                                 | Correct Answer | Frequencies (n) | Percentages (%) |
|----------------------------------------------------------------------------|----------------|-----------------|-----------------|
| Exclusive breastfeeding is recommended for:                                |                |                 |                 |
| 6 weeks                                                                   | 3              | 0.9%            |                 |
| 2 months                                                                  | 1              | 0.3%            |                 |
| 6 months                                                                  | 234            | 71.8%           |                 |
| 8 months                                                                  | 13             | 4%              |                 |
| Don’t know                                                                | 75             | 23%             |                 |
| Breastfeeding improves the immunity of the baby and protects the baby from allergies and asthma. | True | | |
| True                                                                      | 257            | 78.8%           |                 |
| False                                                                     | 8              | 2.5%            |                 |
| Do not know                                                               | 61             | 18.7%           |                 |
| A breast-fed baby has a lower risk of obesity and diabetes.               | True           |                 |                 |
| True                                                                      | 190            | 58.3%           |                 |
| False                                                                     | 23             | 7.1%            |                 |
| Do not know                                                               | 113            | 34.7%           |                 |
| Breastfeeding is more time consuming than bottle feeding.                 | False          |                 |                 |
| True                                                                      | 130            | 39.3%           |                 |
| False                                                                     | 68             | 20.9%           |                 |
| Do not know                                                               | 128            | 39.3%           |                 |
| Breast-fed babies have fewer dental cavities (i.e., problems with tooth decay). | True | | |
| True                                                                      | 193            | 59.2%           |                 |
| False                                                                     | 31             | 9.5%            |                 |
| Do not know                                                               | 102            | 31.3%           |                 |
| Drugs and alcohol can be passed through breast milk to the baby.          | True           |                 |                 |
| True                                                                      | 200            | 61.3%           |                 |
| False                                                                     | 25             | 7.7%            |                 |
| Do not know                                                               | 101            | 31%             |                 |

Personal attitudes towards sexuality and reproductive health

Of the 326 participants, 79 (24.2%) agreed that sex before marriage is acceptable whereas 87 (26.7%) agreed that abstaining from sex is difficult during adolescence (Table 6). Only sixty-one (18.7%) thought that a female who remains a virgin during her adolescent years is old-fashioned. Fifty-three (16.3%) agreed that using a condom during sexual intercourse reduces sexual pleasure, while 101 (30%) agreed that the use of contraceptives causes sterility in women. Furthermore, 79 (23.9%) agreed that they would be too embarrassed to buy or procure condoms and 52 (16%) agreed that their partners would reject them if they asked them to use a condom. The majority of the participants (86.8%, n = 283) agreed that family planning services can help prevent an unwanted pregnancy. Overall, 216 (66.3%) agreed that females are responsible for protection during sexual intercourse.

Peer influence

Table 6 shows that 231 (70.9%) of the participants disagreed that their friends believed in waiting for marriage to have sex. Furthermore, 176 (54%) disagreed that their friends believed in using condoms. Of the 326 participants, only 101 (31.9%) stated that none of their friends were adolescent mothers.

Categorical variables included in the regression models

The following categorical variables were included in the regression models: repeat adolescent pregnancy, highest education level, the participants’ mothers’ marital status, and answering the pregnancy, HIV/AIDS and STI questions correctly. The frequency distributions of these categorical variables can be found in Table 1. Overall, only 143 (43.9%) participants answered 50% or more of the knowledge questions correctly while 183 (56.1%)
answered less than 50% of the knowledge questions correctly.

**Bivariate analysis**

As shown in Table 7, there was no relationship between answering the pregnancy and HIV/STI knowledge questions correctly and having a repeat adolescent pregnancy. Almost equal proportions of the participants with and without repeated pregnancies answered 50% or more questions correctly. Age was positively associated with adolescent repeat pregnancies whereby older participants had higher repeat pregnancies than their younger counterparts ($p < 0.0001$). The participants with a secondary level of education had fewer repeat pregnancies indicating that a higher education level was a protective factor against repeat pregnancies ($P < 0.0001$).

**Logistic regression analysis**

Logistic regression was used to construct models. In each model, the outcome variable (adolescent repeat pregnancies) was regressed upon a primary ‘exposure of interest’. The exposure variables were age, education level, participants’ mothers’ marital status, and answering 50% or more of the questions correctly. The separate
univariate models with each of these variables are depicted in Table 8. According to the univariate models, the participants’ age, education level and biological mothers’ marital status shared a relationship with adolescent repeat pregnancy. A multivariable model regressing adolescent repeat pregnancy on the socio-demographic and biological mothers’ characteristics showed a significant relationship between age, education level, and marital status and the likelihood of repeat pregnancy.

### Table 6: Personal attitudes and peer influences regarding sexuality and reproductive health (N = 326)

| Personal attitude statements                                                                 | Frequencies (n) | Percentages (%) |
|---------------------------------------------------------------------------------------------|-----------------|-----------------|
| Sex before marriage is acceptable.                                                          |                 |                 |
| Agree                                                                                       | 79              | 24.2%           |
| Disagree                                                                                    | 233             | 71.5%           |
| Strongly disagree                                                                           | 14              | 4.3%            |
| For a woman, having multiple sex partners is an indication of her attractiveness.           |                 |                 |
| Agree                                                                                       | 10              | 3.1%            |
| Disagree                                                                                    | 240             | 73.6%           |
| Strongly disagree                                                                           | 76              | 23.3%           |
| It is important for a man to have multiple sex partners to prove his manhood.               |                 |                 |
| Agree                                                                                       | 6               | 1.8%            |
| Strongly Agree                                                                              | 1               | 0.3%            |
| Disagree                                                                                    | 142             | 43.6%           |
| Strongly disagree                                                                           | 177             | 54.3%           |
| A female who remains a virgin during her adolescence is old-fashioned.                       |                 |                 |
| Agree                                                                                       | 61              | 18.7%           |
| Strongly agree                                                                              | 1               | 0.3%            |
| Disagree                                                                                    | 242             | 74.2%           |
| Strongly disagree                                                                           | 22              | 6.7%            |
| Having a baby at an early age is a sign of maturity.                                       |                 |                 |
| Agree                                                                                       | 43              | 13.2%           |
| Strongly agree                                                                              | 1               | 0.3%            |
| Disagree                                                                                    | 272             | 83.4%           |
| Strongly disagree                                                                           | 10              | 3.1%            |
| Abstaining from sex is difficult during adolescence.                                        |                 |                 |
| Agree                                                                                       | 87              | 26.7%           |
| Strongly agree                                                                              | 2               | 0.6%            |
| Disagree                                                                                    | 236             | 72.4%           |
| Strongly disagree                                                                           | 1               | 0.3%            |
| Using a condom during sexual intercourse reduces sexual pleasure.                           |                 |                 |
| Agree                                                                                       | 53              | 16.3%           |
| Strongly agree                                                                              | 2               | 0.6%            |
| Disagree                                                                                    | 265             | 265 (81.3%)     |
| Strongly disagree                                                                           | 6               | 6 (1.8%)        |
| The use of contraceptives cause sterility in women.                                         |                 |                 |
| Agree                                                                                       | 101             | 31%             |
| Strongly agree                                                                              | 1               | 0.3%            |
| Disagree                                                                                    | 221             | 67.8%           |
| Strongly disagree                                                                           | 3               | 0.9%            |
| Family planning services can prevent an unwanted pregnancy.                                |                 |                 |
| Agree                                                                                       | 283             | 86.8%           |
| Strongly Agree                                                                              | 4               | 1.2%            |
| Disagree                                                                                    | 39              | 12%             |

### Table 6: Personal attitudes and peer influences regarding sexuality and reproductive health (N = 326) (Continued)

| Personal attitude statements                                                                 | Frequencies (n) | Percentages (%) |
|---------------------------------------------------------------------------------------------|-----------------|-----------------|
| I would be too embarrassed to buy or find condoms.                                          |                 |                 |
| Agree                                                                                       | 78              | 23.9%           |
| Strongly agree                                                                              | 3               | 0.9%            |
| Disagree                                                                                    | 240             | 73.6%           |
| Strongly disagree                                                                           | 5               | 1.5%            |
| My partner would reject me if I asked him to use a condom.                                 |                 |                 |
| Agree                                                                                       | 53              | 16%             |
| Strongly agree                                                                              | 1               | 0.3%            |
| Disagree                                                                                    | 267             | 81.9%           |
| Strongly disagree                                                                           | 6               | 1.8%            |
| Females are responsible for protection during sexual intercourse.                           |                 |                 |
| Agree                                                                                       | 216             | 66.3%           |
| Strongly agree                                                                              | 2               | 0.6%            |
| Disagree                                                                                    | 106             | 32.5%           |
| Strongly disagree                                                                           | 2               | 0.6%            |
| Peer influence statements                                                                   |                 |                 |
| Most of my friends believe in waiting for marriage to have sex.                            |                 |                 |
| Agree                                                                                       | 76              | 23.3%           |
| Strongly agree                                                                              | 1               | 0.3%            |
| Disagree                                                                                    | 231             | 70.9%           |
| Strongly disagree                                                                           | 18              | 5.5%            |
| Most of my friends do not believe in using contraception.                                  |                 |                 |
| Agree                                                                                       | 144             | 44.2%           |
| Strongly agree                                                                              | 5               | 1.5%            |
| Disagree                                                                                    | 176             | 54%             |
| Strongly disagree                                                                           | 1               | 0.3%            |
| Most of my friends do not believe in using condoms.                                         |                 |                 |
| Agree                                                                                       | 124             | 38%             |
| Strongly agree                                                                              | 5               | 1.5%            |
| Disagree                                                                                    | 195             | 59.8%           |
| Strongly disagree                                                                           | 2               | 0.6%            |
| How many of your friends are adolescent mothers?                                            |                 |                 |
| Many                                                                                        | 31              | 9.5%            |
| Some                                                                                       | 23              | 7.1%            |
| A few                                                                                      | 164             | 50.3%           |
| None                                                                                       | 104             | 31.9%           |
| Do not know                                                                                | 4               | 1.2%            |
pregnancies (outcome of interest) on the indicator of answering 50% or more of the pregnancy, HIV/AIDS and STI knowledge questions correctly (exposure of interest) is also depicted in Table 8. This model adjusted for age, education level, and participants’ mothers’ marital status. For each model, an odds ratio for each of the variables in the model, as well as the 95% confidence intervals, were produced. In the adjusted model, the indicator for whether or not the participants answered 50% of the pregnancy, HIV/AIDS and STI knowledge questions correctly was not significant (adjusted odds ratio [OR] 1.04, 95%, CI 0.6–1.81, \( p = 0.8862 \)).

**Discussion**
Knowledge plays an important role in facilitating people’s access to healthcare [16]. The aim of this study was to determine the knowledge, personal attitudes and peer influences related to pregnancy, sexual and reproductive health among adolescents who attended maternal health services in a district hospital in Ugu, KwaZulu-Natal, South Africa. Although 43.9% of participants scored > 50% for the knowledge test on pregnancy, HIV/AIDS and STIs, there are serious gaps in their knowledge of danger signs of pregnancy, anaemia, alcohol and tobacco use during pregnancy and sexually transmitted infections.

In our study, 60.4% of the participants was able to identify vaginal bleeding as a sign of preterm labour. In reviewing the literature, this is low when compared to 86.0 and 82.2% who were able to identify vaginal bleeding as a danger sign during pregnancy in studies conducted in Malaysia and Tanzania respectively [16, 17]. The current study found that only 23.3% of the participants was able to identify blurred or spotted vision as an abnormal sign during pregnancy in comparison to 47.8 and 39.4% in studies conducted in Malaysia and Ethiopia respectively [16, 23]. Prior studies have noted the importance of pregnant women having adequate pregnancy related knowledge to identify the appropriate steps to decrease the risk of preterm labour. In this study, 44.2% of the participants was able to identify the appropriate steps to decrease the risk of preterm labour. This result is in concordance with the level of pregnancy related knowledge

**Table 7** Bivariate analysis (comparison of model variables for participants who had repeat pregnancies versus those who did not)

| Variables                  | Adolescent Repeat Pregnancies | P-value* |
|----------------------------|-------------------------------|----------|
|                            | No \( n = 261 \)              | Yes \( n = 65 \) |
| Age (years)                | 18.0 (17.0–19.0)              | 19.0 (18.0–19.0) | < 0.0001 |
| Mother’s Marital Status    |                               |           |
| Single                     | 126 (48.3%)                   | 21 (32.3%) | 0.064    |
| Married                    | 76 (29.1%)                    | 25 (38.5%) |
| Other                      | 59 (22.6%)                    | 19 (29.2%) |
| Highest Education Level    |                               |           |
| Primary                    | 2 (0.8%)                      | 7 (10.8%) | < 0.0001 |
| Junior                     | 6 (2.3%)                      | 6 (9.2%)  |
| Secondary                  | 253 (96.9%)                   | 52 (80.0%) |
| Answered knowledge questions correctly | 1.0 | 50% or more correct answers | 115 (44.1%) | 28 (43.1%) | 0.0001 |
| Less than 50% correct answers | 146 (55.9%) | 37 (56.9%) |

All continuous values are reported with median and inter-quartile range, Med (IQR), while categories are reported in percentages: n (%)
*p-value was obtained by Wilcoxon signed-ranked test for continuous variables and Fisher’s exact test for categorical variables, respectively

**Table 8** The association between answering 50% or more of the pregnancy and STI/HIV questions correctly and adolescent repeat pregnancies, adjusting for age, education, and biological mothers’ marital status

| Variables                  | Univariate models | Multivariable logistic regression |
|----------------------------|-------------------|-----------------------------------|
|                            | OR 95% CI P value | OR 95% CI P value                |
| Age                        | 2.69 1.85–4.47 0.0000 | 2.79 1.87–4.47 0.0000 |
| Highest education level    |                   |                                  |
| Primary                    | Ref               | Ref                               |
| Junior                     | 0.29 0.03–1.8 0.248 | 0.41 0.04–3.43 0.4194 |
| Secondary                  | 0.06 0.01–0.25 0.0005 | 0.05 0.01–0.24 0.00058 |
| Mothers’ Marital Status    |                   |                                  |
| Single                     | Ref               | Ref                               |
| Married                    | 1.97 1.04–3.8 0.0392 | 1.77 0.86–3.69 0.1207 |
| Other                      | 1.93 0.96–3.87 0.0626 | 1.97 0.01–4.3 0.08524 |
| Answered knowledge questions correctly |            |                                  |
| Answered 50% or more questions correct | Ref | Ref                               |
| Answered less than 50% of answered correctly | 1.04 0.6–1.87 0.8862 | 0.81 0.44–1.51 0.5022 |
among pregnant women attending an antenatal clinic in Pune, Maharashtra [24]. The ability of pregnant women to identify the signs of preterm labour is critical if they are to counteract this emergency. Anaemia is associated with adverse events in pregnancy and is common among pregnant adolescents [25]. The participants in the current study demonstrated poor knowledge of the signs and symptoms of anaemia. More than half (63.2%) was not aware that iron deficiency can lead to anaemia. This is in contrast to the findings in Brosankro, Ghana, where only 3% of the participants in a study, was unaware of the link between iron deficiency and anaemia [26]. In the current study, 59.5% of the participants could identify only one out of thirteen signs and symptoms of anaemia. Less than half of the participants in this study identified pale lips (31.3%) and pale finger nails (29.8%) as symptoms of anaemia. This is low in comparison to 87% of participants who was aware of this fact in a study in Dahalik, Baghdad [27]. In the current study, 43.3% of the participants identified preterm delivery and low birth weight as complications of anaemia, in comparison to 25.0 and 11.0% who respectively correctly identified preterm labour and low birth weight as complications of anaemia in a Ghanaian study [26]. Moreover, knowledge of the benefits of folic acid supplementation and neural tube defects is important, yet this study found that only 35.6% of the participants knew of the benefits of folic acid for brain and spine development. This was slightly better than the findings of a study conducted in Pakistan, in which only 18.4% of the participants knew of the importance of folic acid for the unborn foetus [28]. A study conducted in Sudan found that only 8.9% of 1000 pregnant women knew that folic acid prevented birth defects [25].

Alcohol and tobacco use during pregnancy is detrimental to the health of the unborn child [29]. Persistent tobacco inhalation can cause preterm labour, low birth weight, intra-uterine growth retardation, and spontaneous abortion [30]. It is also related to foetal alcohol syndrome [31]. The prevalence of foetal alcohol spectrum disorder (FASD) in South Africa ranges from 29 to 290 per 1000 live births [32]. Many research studies have focused on the population’s knowledge of the harmful effects of smoking and alcohol use among adult women of reproductive age. However, research data of knowledge of this threat among pregnant and parenting adolescent women are limited. This is a matter of grave concern, as this study found that only 19.6% of the participants knew that alcohol consumption results in low birth weight. A national survey among Australian women aged 18 to 45 years revealed that only 28.5% knew that drinking alcohol during pregnancy could result in low birth weight [31]. Furthermore, the participants’ knowledge of the negative effects of tobacco during pregnancy on the unborn child was poor, as only 22.4, 16.6 and 6.7% identified that smoking tobacco during pregnancy can result in low birth weight, spontaneous abortion and preterm labour respectively. These findings are low compared to those of a US study among pregnant adolescents and adolescent mothers that found that 79.6, 85.3 and 89.0% were able to correctly identify that smoking during pregnancy results in low birth weight, spontaneous abortion and preterm labour respectively [33].

In our study, 42.9% of the participants knew that pesticides should be avoided, compared to 96.0% who knew this in a survey conducted in Northern Thailand [34]. However, regardless of their high knowledge of the harmful effects of pesticides to the unborn child, 37.0% of participants in Thailand admitted that they still used pesticides in their homes during pregnancy [34]. The knowledge of the harmful effects of pesticides to the unborn child is of public health importance due to neurodevelopmental toxicity [34]. Cats harbour the protozoan parasite Toxoplasma Gondii in their intestinal tract [35] that causes Toxoplasmosis. Toxoplasmosis infection during pregnancy can cause spontaneous abortion, preterm labour, cerebrospinal fluid abnormalities, retinchoroiditis scarring, and intra-uterine growth retardation [35]. Respectively, only 41.1 and 37.0% of the participants in this study agreed that playing with cats and cleaning a cat’s litter box should be avoided. This rate is low compared to the 77.9% of participants who correctly indicated that a pregnant woman should avoid cleaning a cat’s litter box in a study conducted in the Netherlands [36]. The contrast in these findings could be due to a higher literacy rate and access to antenatal education in the Netherlands. The World Health Organization recommends exclusive breastfeeding for the first 6 months as a global strategy for infant and young child feeding [37]. Breastfeeding has numerous health benefits for the mother and child. The benefits for the child include reduction of dental cavities, improved immunity, and protection against the risk of diabetes and obesity later in life [38]. Most studies to date have investigated knowledge of breast feeding practices rather than knowledge of the health benefits of breastfeeding. In this study, 71.8% correctly identified that the recommended period for exclusive breast feeding is 6 months. Similarly, 70.13% of participants in a study conducted in Croatia identified that exclusive breast feeding is recommended for 6 months [39]. Most of the participants (78.8%) in this study agreed that breastfeeding improves the immunity of babies. Although somewhat lower, this finding was high enough to support the 92.9% of a Croatian study [39]. STIs increase the risk of HIV infection, pelvic inflammatory diseases, life threatening pregnancies, and infertility [40]. Adolescents have a higher risk of STIs than adults [41]. In this study, the participants were unable to
identify common STIs as only 24.5, 15.0 and 15.6% were able to identify Gonorrhoea, Syphilis, and Genital Herpes as STIs respectively. These findings are consistent with those of a study conducted in Nigeria where 23.0% identified Gonorrhoea, 2.8% identified Syphilis, and 6.5% identified Genital Herpes as STIs [42]. However, the ability to identify signs and symptoms of STIs was better as most participants were able to correctly identify genital sores (57.1%, n = 186), burning urination (54.9%, n = 179), discharge from the vagina (65.6%, n = 214), and discharge from the penis (59.8%, n = 195) as symptoms of STIs. These response rates were far better than those found by Sharma and Sherkane [40], in whose study only 22.8, 41.7 and 13.9% identified genital sores, genital discharge and burning urination respectively as signs and symptoms of STIs.

The prevalence of HIV amongst women of reproductive age is high in South Africa [43]. In this study, 70.2% of the participants were aware that a pregnant woman infected with HIV can transmit this disease to her unborn child, which was high in comparison to the 51.6% in a study conducted in India [44]. Most participants (92.6%) in the current study confirmed that condom use can prevent HIV and STIs, in comparison to 55.6% who had this knowledge during a study conducted in Nepal [45]. With regards to HIV prevention, 7.7% thought that birth control pills would prevent HIV infection. This is low compared to the 41% in a study conducted in South Delhi, India, who incorrectly believed that birth control pills would prevent HIV infection [46].

A recent study by Amod et al. explored adolescent mothers’ perceptions of the Life Orientation curriculum in Gauteng, South Africa [47]. The participants felt that although sexual health was included in Life Orientation, their teachers were not comfortable to teach them about sex education. Furthermore, the participants reported that learners would laugh during the lesson and this annoyed the teacher. Under these circumstances, the lessons on sexual health would be dismissed. Similarly, a study on learners’ experiences of Life Orientation in the North-West Province reported that 33.3% of learners mentioned that sex education was covered in Life Orientation [48]. In this study, 87.7% mentioned that adolescent pregnancy was covered in Life Orientation, while 77.9% mentioned that HIV/AIDS was covered in Life Orientation. Contrary to the findings of our study, 33.8% of the North-West study stated that HIV/AIDS was covered and 22% stated that adolescent pregnancy was covered in Life Orientation.

On face value, the Life Orientation programme appears encouraging, but the practical implementation of this programme has been plagued by many problems, and thus the limited research that has been done on its efficacy in terms of SRH education should be augmented as a matter of urgency.

Personal attitudes towards sexuality and reproductive health is often under-researched. In this study, only 26.7% agreed that abstaining from sex is difficult during adolescent years. This suggests that most participants had a positive attitude towards abstinence. Similarly, a study by Masters et al. [49] found that more females than males reported positive attitudes towards abstinence (means 3.6 vs 4.0 on the five-point Likert scale, where a score of 3 was neutral). In the current study, only 16.3% believed that condoms reduce sexual pleasure during sexual intercourse. During a literature review regarding decision making and condom use among South African women, Mash et al. [50] found that men were more likely to believe that condoms reduce sexual pleasure than women. In a patriarchal society, South African women are disempowered and more likely to please their partners by agreeing not to use condoms during sexual intercourse [50]. Thus gender based power inequalities were clearly voiced when 66.3% of the participants in this study agreed that it is females who are responsible for protection during sexual intercourse. Furthermore, 23.9% indicated that they would be too embarrassed to buy or find condoms, which suggests that they were not in a situation to negotiate protective sexual intercourse.

Peer influence is related to sexual risk behaviour and adolescent contraceptive behaviour is also influenced by peer norms. Govender et al. [51] conducted a scoping review and found that adolescents who associated with friends who were adolescent parents were more likely to become adolescent parents themselves. In the current study, 66.8% of the participants had friends who were adolescent mothers which, based on the former study, may suggest that they might be at risk of engaging in unprotected sexual behaviour as well.

The participants limited knowledge of preterm labour, anaemia, alcohol and tobacco use, and sexually transmitted infections may hamper the Safe Motherhood Initiative. The misconceptions harboured by these adolescents about oral contraception and protection against HIV and STIs also suggest the threat of unsafe sexual practices among young people in the Ugu community. Health education on SRH is an integral part of the Safe Motherhood Initiative that is aimed at educating societies about safe sexual conduct.

The study has several limitations. Firstly, our study was conducted in only one district in KwaZulu-Natal and therefore the findings may only be generalised to the Ugu and similar districts. Moreover, the study did not investigate the participants’ sources of pregnancy or information regarding their sexual and reproductive health. Recall bias was likely to have occurred when participants are asked about their past exposures. The use of convenience sampling could have also lead to under-representation or over-representation of particular groups within a sample.
Although our inclusion criteria stipulated that adolescent girls under the age of 18 years had to obtain parental/legal guardian permission prior to consenting to participate in this study, we report that there were no participants under 18 years who were excluded in the study because parents and legal guardians were available to provide written permission.

Conclusion

The adolescent participants’ knowledge of pregnancy, sexual and reproductive health was deficient in many respects. Our research has shown that, regardless of repeat pregnancies, adolescents were not necessarily better informed about pregnancy, sexual and reproductive health. Thus we conclude that social determinants, modes and platforms regarding the delivery of adolescent sexual and reproductive health education have become more important than ever before. Moving forward, an innovative mode to the delivery of sexual and reproductive health education includes the emerging digital platform [1, 52]. The digital platform encompasses social media, multimedia and mobile phones which is growing popular among young people. Previous studies in Sub-Saharan Africa have demonstrated the feasibility of using mobile phones to deliver SRH information [53, 54].

Schools can play a role in reducing high risk sexual behaviour, transforming the future and improving the well-being of all adolescents. The role of the education sector is therefore crucial as schools can offer skills based SRH education. Schools are also an ideal social environment that can target the individual, families and societies [15]. The role of the healthcare sector is equally important. Health facilities need to be adolescent or youth friendly with convenient service hours. Healthcare providers also need to provide non-judgemental adolescent SRH education and services. Universal access to SRH as echoed in SDG 3 can only be achieved through intersectoral collaboration. Knowledge through education is likely to ensure that adolescent women are better informed to make appropriate decisions about their health during pregnancy and childbirth.

Additional file

Additional file 1: Adolescent pregnancy, sexual and reproductive health questionnaire. (DOCX 69 kb)

Abbreviations

- AIDS: Acquired Immunodeficiency Syndrome; HIV: Human Immunodeficiency Virus; MMSE: Modified mini mental state exam; SRH: Sexual and Reproductive Health; STI: Sexually transmitted disease

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Authors’ contributions

DG was a principal investigator, SN was the supervisor, and MT was the co-supervisor. All the authors contributed equally to the preparation of the paper/article. All authors have read and approved the manuscript.

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Availability of data and materials

The data used to elicit the findings of this study are available from the corresponding author upon reasonable request.

Ethics approval and consent to participate

Ethical clearance to conduct the study was obtained from the Biomedical Research Ethics Committee of the University of KwaZulu-Natal (BESS53/16). Institutional approval was granted by the KwaZulu-Natal Department of Health and the Chief Executive Officer of the district hospital to conduct the research. Participation was voluntary and informed consent was granted by all participants. The informed consent was written. Parents’ or legal guardians’ permission was obtained for each participant under the age of 18 who participated in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Author details

1KwaZulu-Natal Department of Health, Durban, South Africa. 2School of Nursing and Public Health, Discipline of Public Health Medicine, University of KwaZulu-Natal, Durban, South Africa. 3Developing Research Innovation Localisation and Leadership (DRILL) Fellow, University of KwaZulu- Natal, Durban, South Africa.

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