

ORIGINAL ARTICLE

Title: From “sugar daddies” to “sugar babies”: exploring a pathway between inequitable sexual relationships, condom use, and adolescent pregnancy in South Africa

Running header: An exploratory pathway to adolescent pregnancy in South Africa

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Abstract

Background: Adolescent pregnancy has been linked to adverse outcomes for both mothers and children. Most studies proposing potential risk pathways for adolescent pregnancy in South Africa are qualitative, hypothesizing links among inequitable relationships, reduced condom use and higher pregnancy rates. No known South African studies have quantitatively explored pathways leading to adolescent pregnancy.

Objectives: This study aimed to: (i) identify which literature-hypothesized factors were associated with adolescent pregnancy and (ii) explore a hypothesized pathway of risk by assessing whether condom use mediated the relationship between inequitable sexual relationships and adolescent pregnancy.

Methods: An exploratory cross-sectional survey in six urban and rural health districts of three South African provinces. 447 sexually-active girls aged 10-19 were interviewed, and analyses used multivariate logistic regressions controlling for confounders. Mediation tests were conducted using Hayes' bootstrapping methodology.

DIRECTIONALITY!!!! I really don't want to have to repeat this, Please go through whole paper and check. Consistent condom use and school enrolment NEGATIVELY assoc with preg, presumably, and long-term absence and ineq sex POSITIVELY assoc with preg. I know the b-weights are there but readers don't understand them.

Results: Consistent condom use ($B=-2.118$, $OR=8.921$, $p\leq 0.001$), engaging in inequitable sex ($B=0.299$, $OR=1.349$, $p=0.007$), long-term school absences ($B=1.378$, $OR=3.967$, $p\leq 0.001$) and school non-enrollment?? were the strongest factors associated with adolescent pregnancy. The indirect effect of engaging in inequitable sex on adolescent pregnancy through condom use was significant, irrespective of age, age at sexual initiation, poverty and residential environment ($B=0.1431$, $SE=0.0478$, $CI\ 0.0670-0.2534$).

Conclusion: This multi-site cross-sectional survey supports qualitative hypotheses that girls' inability to negotiate their partners' condom use in inequitable sexual relationships may drive adolescent pregnancy. Interventions addressing these relationships, facilitating condom use and increasing access to sexual and reproductive health services among adolescent girls might avert unwanted and unplanned adolescent pregnancies.

- Inequitable sexual relationships and long-term school absences are associated with higher rates of pregnancy, while consistent condom use and school enrolment with lower rates of pregnancy among South African adolescent girls. GOOD DIRECTIONALITY!
- In exploratory analysis, inconsistent condom use mediated the relationship between inequitable sexual relationships and adolescent pregnancy.
- Interventions must address factors shaping lower condom use among partners of adolescent girls' in inequitable sexual relationships, involving older partners or transactional sex, including efforts to increase access to other, female-led, family planning methods. Read this sentence aloud. Add in a full stop so it makes sense.

Introduction

Adolescent pregnancy is a key public policy issue in South Africa, where pregnancy rates increase exponentially for girls after the age of 15. 1% of girls under-15 report ever being pregnant but this rate increases to 27% of 15-19 year-olds (1). Although motherhood is valued as an integral part of a woman's life in many communities (2), evidence from South Africa suggests that adolescent pregnancy is associated with poorer access to ante-natal services, post-natal care (3), and other negative socio-economic outcomes for adolescent mothers (4). These are further aggravated by low access to non-health services that can help alleviate negative outcomes of early pregnancy (5). For example, only a third of adolescent girls that become pregnant in South Africa return to school, with each year that passes after giving birth decreasing the chances of ever returning to school (6).

Predictors of Adolescent Pregnancy in South Africa

Research and interventions in South Africa have focused on reducing high-risk behaviours that lead to both increased HIV infection and unwanted adolescent pregnancy (7). Potential risk factors associated with adolescent pregnancy among girls in South Africa include: age of first sexual intercourse (8), having an older partner (8-10), disruption in the family structure through parental death (4, 11), household size (12), housing type and residential environment (4, 12), poverty (13), and male condom use (8, 9, 12, 13). School dropout and disruptions in attendance have also been linked to increased risk of unwanted pregnancy in South Africa (4, 6, 14), while in other Sub-Saharan countries, staying in school has been linked to reduced rates of unwanted adolescent pregnancy (15).

A potential pathway to adolescent pregnancy

While there is evidence that having older sexual partners is associated with increased sexual risk behaviours among South African youth (8), evidence on potential causal models for adolescent pregnancy is limited. A 2010 literature review identified several factors that increased vulnerability to early unwanted pregnancy in South Africa, namely: early sexual debut, gender-

based violence, sexual coercion, having older sexual partners, and transactional sexual exploitation (1). A matched case-control study among 544 young people in Cape Town identified that adolescent pregnancy was associated with having an older partner, forced sexual initiation and experiences of physical abuse (10, 12). These studies identified predictors of adolescent pregnancy but did not explore potential causal mechanisms.

There is increasing evidence of South African adolescents, primarily girls, engaging in sex with older partners in exchange for material goods, also known as the “sugar daddy” phenomenon (16, 17), with particularly high levels of perceived acceptability of these relationships amongst younger girls (8). A qualitative study among 76 adolescents in the KwaZulu Natal found that adolescent pregnancy was linked to limited use of condoms, unequal gender relations, sexual violence and poor partner communication (9). Furthermore, two studies examining first-time sexual experiences among adolescent girls linked coercive sex to lack of condom use and unwanted pregnancy (18). These qualitative findings suggest that the inequitable power structure within relationships between younger girls and older partners, may reduce adolescent girls’ ability to negotiate condom use by their partners, putting them under greater pressures to engage in unprotected sex (9, 19). However, none of these studies quantitatively explore the relationship between condom use, inequitable sexual relationships and adolescent pregnancy.

Mediation analysis is a valuable technique in shedding light on causal pathways, which are essential for successful theory-driven, evidence-based interventions (20). Though mediation analysis is usually conducted using longitudinal data, exploratory mediational analysis contributes to hypothesized models that can be tested through future intervention research (21). In light of the dearth of successful interventions to prevent adolescent pregnancy globally (22) and in South Africa (1), hypothesized pathways should be explored.

This study aimed to: (i) identify which literature-hypothesized factors were associated with adolescent pregnancy and (ii) explore a hypothesized pathway of risk by assessing whether condom use mediated the relationship between inequitable sexual relationships and adolescent pregnancy. With a

multi-site survey, we *explored why italicized?* a hypothesized pathway of risk of adolescent pregnancy. We extend existing qualitative research, by examining the direct and indirect effects of inequitable relationships on increased likelihood of adolescent pregnancy and exploring to what extent this relationship operates through reduced condom use.

Methods

A cross-sectional survey was administered in 2009-2010 to 6,000 adolescents in three provinces in South Africa: Mpumalanga, KwaZulu-Natal and Western Cape. The research (www.youngcarers.org.za) was a partnership between University of Oxford, University of Cape Town, University of KwaZulu-Natal, University of Witwatersrand, Brown University and the South African National Departments of Social Development, Health and Education. Ethical approval was received from Research Ethics Committees of the above universities and National Departments of Social Development and Health.

We focused this analysis on the sexually-active girls in our sample. Of the 3,336 girls aged 10-19, $n=477$ sexually-active girls were included in analyses. Participants lived in deep rural, commercial farming rural, peri-urban, urban and urban-homeland areas. All girls were residents in six rural and urban health districts of three provinces, each area having an antenatal HIV prevalence equal or higher than 30%. Within each health district, census enumeration areas or designated tribal areas were randomly selected. Consecutive door-to-door household sampling was used to identify participants: in households where more than one eligible child resided, one was randomly selected to participate.

Procedures

Participants were provided with information and consent forms in their chosen language, explaining the nature of the research in accessible wording and emphasizing the option to opt-out at any point. Given limited literacy, all information and consent/assent forms were read aloud (23). Voluntary, written consent was obtained from every primary caregiver, and voluntary, written assent from every child (refusal rate 2.5%). Following recruitment, participants completed the questionnaire at the place of their choice, primarily their homes,

secluded outdoor areas, or private rooms in their schools. No incentives for participation were provided, apart from refreshments and certificates of appreciation. All data collected was identified by a unique participant number and kept in confidential files. Participants completed self-reported questionnaires lasting 40-60 minutes with the support of trained fieldworkers in their language of choice. All items included in the questionnaire package (modeled on a teen magazine) and the formatting of the data collection tool were developed with our teen advisory group, then independently piloted in adolescent focus groups. Sexual behavior, abuse and highly confidential information were answered in separate anonymous sheets (marked only by participant identification number), which were inserted and sealed into separate envelopes by research participants themselves.

Confidentiality was maintained unless participants reported abuse and requested assistance or were at risk of significant harm. In cases when participants reported on-going abuse, rape or risk of significant harm, referrals were made to child protection services and to HIV testing and treatment services as appropriate. Where prior abuse or rape had occurred, referrals were made to support and counselling services. WHERE IS PART ABOUT TRANSLATION? This is important and needs to go back in or they think it was done in English! I've cut words elsewhere to make room.

Measures

Adolescent pregnancy was defined as ever having been pregnant before or during the data collection, and measured as a dichotomous variable using items from the National Survey of HIV and Risk Behaviour Amongst Young South Africans (8).

Inequitable Sexual Relationships was defined as lifetime prevalence of engaging in sex with older partners *or* reporting any forms of transactional sex, with both variables combined into a score. Measures were adapted from the National Survey of HIV and Risk Behaviour Amongst Young South Africans (8) and the South African Demographic and Health Survey (DHS) (26). *Age-asymmetric relationships* were computed as a binary variable for having ever had a sexual partner more than 5 years older, based on the findings of a nationally representative study among 15-24 year-old South Africans (27).

Transactional sex was computed as a binary variable of whether girls reported having ever had sex with someone in exchange for food, shelter, school fees, transport or money, using a scale from the National Survey of HIV and Risk Behaviour Amongst Young South Africans (8).

Condom use was measured as a 5-point scale of condom use during sex over the last year (0=never, 1=less than half the time, 2=half the time, 3=more than half the time, and 4=always, using an item from the South African Demographic Health Survey (28).

Orphan Status was designated as self-reported of orphanhood by either parent or both, using the UN definition (29), through a categorical variable: 0=not an orphan; 1=maternal orphan; 2=paternal orphan; and 3=both parents deceased. Parental deaths were collected through a face-to-face interview, though where possible, child self-report was corroborated by teachers, social workers and surviving second parents (in the case of single orphanhood) (Cluver & Orkin 2009).

Abuse was measured using UNICEF scales for sub-Saharan Africa, with conservative cut-offs for severe abuse (30). Any type of abuse was dichotomized with all girls that reported physical or emotional abuse, domestic conflict or domestic violence over the last week or sexual abuse in their lifetime coded as 1. Sexual abuse was defined as unwanted genital contact or rape. The variable was coded as 0 when the respondent did not report any type of abuse.

Education outcomes included in the questionnaire were developed in partnership with the South African Department of Education, the National Action Committee for Children Affected by HIV and AIDS (NACCA), and NGOs working in the field. Educational outcomes measured included: school enrolment, type of school, and school fees. To examine the relationship between school enrolment and education incentives, *school enrolment (current)* was categorized as: (0=not enrolled, 1=enrolled in a fee paying school, 2=access to free schooling (fees waived or non-fee schools), while *long-term absence (past)* was measured as school non-attendance for longer than one week in the past-year.

Socio-demographic factors including age, gender, household size and employment were derived from the 2001 South African Census (31). A household map was used to better understand household size and employment (32). *Household poverty* was measured using a scale of access to the eight highest socially-perceived necessities for children in South Africa, including: 3 meals a day, school uniform and ability to pay for medical care. The eight items were identified through qualitative interviews (33) and endorsed by over 80% of South Africans in a nationally-representative survey (34). Household deprivation was dichotomized by households lacking 2-8 necessities (1) or lacking 0-1 necessity (0).

Data analysis

Data analysis was conducted in SPSS 18.0. Missing data was minimal (<XX%) on all variables included in the multivariate and mediational analysis. This was achieved through qualitative research and piloting during questionnaire development, verbal interviews by fieldworkers during data collection, and return field visits conducted when missing data were identified.

Analysis was conducted in three stages: First, univariate logistic regressions explored risk and protective factors for adolescent pregnancy hypothesized from extant literature, controlling for socio-demographic co-factors. Second, a hierarchical regression model of all significantly-associated factors ($p < 0.01$) simultaneously was tested through multivariate logistic regression. The final multivariate logistic regression included all factors entered simultaneously, grouped as follows: step 1 – covariates and potential confounders that were tested in stage 1 multivariate analysis but were not significantly associated with adolescent pregnancy, step 2 – relationship factors, and step 3 – education-related factors, controlling for: age, age of sexual initiation, household poverty, province, and rural/urban communities. Condom use was entered as a dichotomous variable to distinguish consistent use from other levels reported – more than half, half, less than half the time and never – as consistent condom use (always) is the only one which would prevent pregnancy.

Third, to investigate a potential mechanism through which factors might influence each other to result in adolescent pregnancy, an exploratory

mediation model was tested using the methodology (and SPSS macro) developed by Preacher and Hayes (35) which allows for the hypothesized mediating variable to be a categorical variable. This analysis aimed to assess whether condom use mediates the association between inequitable sexual relationships and adolescent pregnancy (Figure 1). All analyses controlled for girls' age, residential environment (rural/urban) and province. Condom use was entered as a categorical variable as bootstrapping could not be run with dichotomous variables.

To test mediation, multivariate logistic regressions were conducted using bootstrapping, a non-parametric resampling procedure which does not impose the assumption of normality of the sampling distribution and has higher power to detect mediation while controlling for Type 1 error (36). In recent years, bootstrapping has been extensively applied in testing simple mediation models in behavioural sciences (37, 38), including a recent cross-sectional study from South Africa (1). Bootstrapping with 10000 replications was used to obtain asymptotic 95% confidence intervals (CIs) around the indirect effects. Mediation analyses was conducted using an SPSS macro developed by Hayes (35). For categorical outcomes, bootstrapping produces only unstandardized coefficients of regressions. These coefficients cannot be compared to each other, so Odds Ratios (OR) supported by confidence intervals when available are reported.

Results

Socio-demographic characteristics (Table 1)

The mean age of the sexually active girls (n=447) was 15.9 (SD=1.30), while the mean age of sexual initiation was 14.7 (SD=1.97). Slightly more than half (54.1%) lived in rural areas. One-third of respondents lived in informal (shack) housing (34.4%), with an average of 6 people per household (SD=3.52). Around 30% of the sample lived in household where no one was employed, and 51.7% of households benefited from a social grant. Two-thirds of respondents reported missing two or more items in the basic necessities scale. School enrolment rates were 88.5%, while 52.5% of the girls attended a free school or were exempt from paying school fees. One in five respondents reported ever being pregnant (n=91, 20.4%), n=81 (89%) of which 7.2% (n=6) were currently pregnant.

provided information on the number of children. Nine girls (15.2%) had no children, 60 girls (74.1%) had one or two children, while 9 (11.1%) were pregnant at the time of data collection.

Factors associated with adolescent pregnancy

Girls who used condoms never or inconsistently were nearly 7 times more likely to report pregnancy (OR=8.921, $p \leq 0.001$), while girls who engaged in inequitable sex were nearly 2.5 times more likely to have reported pregnancy (OR=1.349, $p=0.007$). Other determinants included a protective association of being in school (OR=0.248, $p \leq 0.001$), while being enrolled in a free school offered additional protection: girls enrolled in free schools are less likely to have been pregnant (OR=0.22, $p \leq 0.001$). Orphanhood of any type, age of sexual initiation, exposure to any type of abuse, poverty, household size and living in informal (shack) housing were not significantly associated with adolescent pregnancy (see Table 2).

The full model of the determinants of adolescent pregnancy was statistically significant (Nagelkerke $R^2=0.442$, $p \leq 0.001$) (40). Inconsistent condom use and attending a fee-paying school were the only factors that remained significant in the final multivariate logistic regression (Table 3). Engaging in inequitable sexual relationships became statistically non-significant in the model, when inconsistent condom use was included. Good.

Hypothesized pathway of adolescent pregnancy

Multiple qualitative studies suggest that the relationship between inequitable relationships (having an older partner *or* engaging in transactional sex) and adolescent pregnancy may be mediated by lower condom use amongst girls. Would be nice to have some refs here. The findings of the above multivariate logistic regression suggest that there may be a relationship between inconsistent condom use and inequitable sexual relationships, as the latter became non-significant when included in the same model. We proceeded to then explore the validity of a hypothesised mediation model, based on qualitative research and our quantitative findings.

Using the bootstrapping tool developed by Hayes (41), this exploratory mediation model was tested with adolescent pregnancy as outcome, engaging in inequitable sexual relationships as the independent variable and inconsistent condom use as the mediator. Figure 2 shows the results of the exploratory mediational model reporting unstandardized coefficients. Engaging in inequitable sex predicted low condom use ($B = -0.3205$, $p \leq 0.001$), and adolescent pregnancy ($B = 0.3275$, $p = 0.003$). The effect of inequitable sex on adolescent pregnancy became statistically non-significant (though approaching significance) when the effect of condom use was included in the model ($B = 0.2182$, $p = 0.0548$), suggesting a potential mediation effect. As the 95% confidence interval of the indirect effect did not overlap with zero this indirect effect is statistically significant (P&H2004). The indirect effect of condom use on adolescent pregnancy was $B = 0.1431$ ($SE = 0.0478$, CI 0.0670-0.2534). These results should be interpreted with caution given the exploratory nature of this mediation analysis.

Discussion

This study aimed to identify factors and pathways associated with adolescent pregnancy in girls living in high deprivation areas of three South African provinces. In addition, this is the first known study to quantitatively explore the hypothesized relationship between inequitable sex, condom use and adolescent pregnancy.

Factors associated with adolescent pregnancy

Pregnancy rates in our sample ($n = 91$, 20.4%) were higher than those in a study among adolescent learners in the Eastern Cape (12.6%) (42), though lower than the South African DHS2003 (27%) (26). Inconsistent condom use was strongly associated with adolescent pregnancy: compared to girls who reported always using condoms, girls who reported inconsistent use were 6.795 times more likely to have been pregnant ($p \leq 0.001$). Nearly a quarter of all sexually active girls had never used condoms in the last year, while another quarter used them inconsistently. These findings are comparable to those of recent studies among 15-24 year-old learners in the Eastern Cape and

14-17 year-olds in KwaZulu-Natal, where girls reported 46.5% condom use at last sex and 54% overall condom use, respectively (42, 43). To address these significant levels of risk, more research is needed to better understand contraception access, use and acceptability among adolescent girls in South Africa, particularly in the context of high HIV prevalence and socio-cultural norms regarding early parenthood.

Engaging in inequitable sexual relationships (i.e. having had a partner more than 5 years older *or* engaging in transactional sex) was the second factor most strongly associated with adolescent pregnancy ($p \leq 0.001$). These findings support those of other studies in South Africa that link reduced condom use and having an older partner or engaging in transactional sex with poor sexual health outcomes including adolescent pregnancy (10, 17). Given the gender dynamics in inequitable sexual relationships, interventions that explore young women's condom use self-efficacy are needed. Furthermore, effective way to increase access to women-led contraception and women-controlled methods of HIV prevention such as: intrauterine devices (IUDs), microbicides, and female condoms must be tested.

Staying in school even for an additional year has been shown to decrease adolescent fertility significantly (44). The association between school enrolment and adolescent pregnancy in this sample suggest that school enrolment could play a protective role. Surprisingly in our sample, only girls that were attending fee-paying schools reported lower pregnancy rates that were statistically significant, even controlling for household poverty levels. It is important for future studies to better understand possible effects of school-level factors on adolescent pregnancy.

Hypothesized pathway of adolescent pregnancy

Our analysis then explored whether inequitable sexual relationships were linked to adolescent pregnancy via low condom use, a hypothesized model based on qualitative evidence from South Africa, which suggests that younger girls experience pressure from older partners to engage in unprotected sex, which is considered a marker of trust or commitment. Moreover, these relationships are more likely to include sexual coercion and violence, both high risks for unprotected sex (9, 19). Mediation analysis showed that condom

use mediates the association between adolescent pregnancy and inequitable sexual relationships. These findings suggest that engaging in inequitable sexual relationships may result in increased likelihood of adolescent pregnancy through reduced use of condoms. However, as the indirect effect of inequitable sexual relationships was only partially explained by low levels of condom use, future studies should test additional potential mediators. Though these findings were statistically significant, they are exploratory and must be interpreted with caution.

Nonetheless, this study's findings suggest several important areas for further research. Firstly, qualitative research suggests that gender norms and peer pressures experienced by adolescent girls reduce their agency to negotiate condom use (9). Formative research in rural KwaZulu-Natal highlights that young men and women view condom use and negotiation from different perspectives: boys see them as necessary only with casual partners, while girls see condoms as a symbol of love and protection (19). Additional research suggests that adolescent girls felt pressure from their older partners who refused contraception and forbade them from using condoms, in order to prove their love by becoming pregnant (45). Future quantitative research must unpack the extent to which reduced agency to negotiate condom use is affected by perspectives on contraception and fertility of both partners and communication regarding condom use negotiation.

Secondly, our findings raise questions regarding adolescent girls' access to other forms of contraception, in addition to condoms, and ultimately access to the family planning services that provide these means. Specifically, 15.2% of the girls who had ever been pregnant had no children. Though our data does not allow us to distinguish between causes of this, our findings raise questions regarding rates of and decisions leading to termination of pregnancy, which is estimated at 3% nationally (8) and 6.7% in a recent study among n=3,123 young people (13). However, in light of recent findings from trials in South Africa on the potential effect of injectable hormonal contraception on HIV risk among young women, dual protection with condoms (male or female) remains a priority mode of contraception (McCoy2013). Good.

Finally, given differentials in the views of young men and women, research that involves both boys and girls must be conducted. Though some studies include both young men and women, research among couples whose relationship has resulted in adolescent pregnancy would allow for more precise comparison and understanding of differences with regards to the intentionality of the pregnancy, as well as condom use self-efficacy and negotiation. Furthermore, as a recent critical analysis suggests, additional research should be conducted among “sugar daddies” (46) to understand the motivations and perceptions regarding relationships with younger women in general, and condom use. Interventions may need to focus not only on improving young girls’ self-efficacy but also engage with their older partners.

This study has some key limitations. Firstly, the cross-sectional nature of the data requires that results be interpreted with caution, as causal inferences cannot be made (47). Longitudinal studies are needed to establish causality and rule out reverse causality (48). Secondly, the mediation analysis conducted is exploratory and should be interpreted as such for two main reasons: lack of longitudinal data and the bootstrapping methodology used. While the methodology is more rigorous than others and can be applied to categorical mediators, it does so by considering the mediating variable – condom use in our study – as a continuous variable. Thirdly, more specific condom use measures would allow for potential causal relationships to be better elucidated. More recent studies have measured condom use at last sexual intercourse, alongside estimates of condom use over the last 6-months and by type of partner (casual or long-term) (43). Though these measures remain self-reports, more precise condom use measures would strengthen hypothesized models. Lastly, it would be valuable to investigate further whether pregnancies were wanted or not and the nature of the relationship during which pregnancy occurred. Collecting information on motherhood intention is important to understand the causal mechanisms that lead to non-use of condoms and adolescent pregnancy.

In conclusion, though our findings are not generalisable to higher-income communities or other ethnic groups, they help to shed light on potential risk and protective factors for adolescent pregnancy among girls living in deprived communities in South Africa, and explore a hypothesized pathway of risk. Improving our understanding of the mechanisms of high-risk sexual

behaviours is crucial to ensuring adolescent girls lead healthy lives into adulthood. To date, no known interventions have successfully reduced the rate of adolescent pregnancy in South Africa, though several have had impact on other high-risk sexual behaviours, such as condom use, delayed sexual initiation and reduced number of partners (49, 50). Our findings suggest that addressing factors that lead young girls into engaging in transactional sex with older partners may result in more equitable relationships, fewer unplanned and unwanted pregnancies. Stakeholders need to better understand the reproductive health decision-making of young South African women and their partners to increase the likelihood that adolescent mothers and their children attain better life outcomes through more effective interventions.

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TABLE 1 –Socio-Demographic Characteristics of Sexually Active Girls

<i>Characteristics[†]</i>	<i>N (%)</i>	<i>Mean (Standard Deviation)</i>
Age		15.86 (1.30)
Age of sexual initiation		14.7 (1.97)
Ever Been Pregnant	91 (20.4%)	
Number of Children (n=81)		
None	12 (15.2%)	
Pregnant (during data collection)	9 (11.4%)	
1 child	58 (73.4%)	
2 children	2 (2.5%)	
Residential Environment		
Urban	205 (45.9%)	
Rural	242 (54.1%)	
Province		
KwaZulu-Natal	90 (20.1%)	
Western Cape	233 (52.2%)	
Mpumalanga	124 (27.7%)	
Type of Housing		
Informal (Shack)	154 (34.4%)	
Formal	293 (65.6%)	
Household Size		5.5 (3.52)
Household Employment (n=445)		
No one employed	133 (29.8%)	
Number of people who have a job		0.94 (0.79)
Household Poverty (n=443)		
Deprivation of 2 or more items	298 (66.7%)	
Orphanhood (n=442)		
Maternal only	44 (9.8%)	
Paternal only	103 (23%)	
Double	20 (4.6%)	
Current School Enrolment (n=440)		
Enrolled & Free Schooling	248 (55.5%)	
Enrolled & Paying	142 (31.7%)	
Not enrolled	51 (11.5%)	

[†]n=447 for all variables presented in this table unless otherwise noted.

TABLE 2 – Multivariate Logistic Regression Analyses of Potential Determinants and Adolescent Pregnancy

This table includes the results of a series of multivariate regression analysis with adolescents pregnancy as an outcome and the noted determinant as the independent variable, controlling for current age, province and residential environment (rural/ urban).

Determinants	B	OR	95% CI for OR
Poverty	-0.277	0.758	0.433-1.327
Age of Sexual Initiation	-0.089	0.915	0.790-1.060
Consistent Condom Use	-2.188***	8.921	4.583-17.365
Inequitable Sexual Relationships	0.299**	1.349	1.085-1.678
Long-term school absences (past)	1.378***	3.967	1.951-8.068
Orphan Status – maternal only ^a	-0.445	0.641	0.262-1.566
Orphan Status – paternal only ^a	-0.104	0.901	0.483-1.679
Orphan Status – double ^a	0.976	2.654	0.938-7.509
Any type of Abuse	-0.522	0.593	0.343-1.025
Household Size	0.044	1.045	0.987-1.108
Living in Informal (Shack) Housing	-0.259	0.772	0.419-1.421
School Enrolment (current)			
Enrolled, fee-paying	-1.396***	0.248	0.106-0.453
Free Schooling	-1.516***	0.220	0.111-0.555

* Denotes significance at $p \leq 0.05$ level. ** Denotes significance at $p \leq 0.01$ level. *** Denotes significance at $p \leq 0.001$.

^a Compared to not being an orphan.

TABLE 3 – Model Summary for Multivariate Logistic Regression Analysis for Adolescent Pregnancy

Model	Step χ^2	Overall Model χ^2	Nagelkerke R ²	Change in Nagelkerke R ²
Step 1 –Covariates and Potential Confounders	49.666***	49.666***	0.213	-
Step 2 – Hypothesised factors	63.385***	113.051***	0.442	0.229
Coefficients for Final Model including all determinants	B	OR	95% CI for OR	
Consistent Condom Use	-1.956***	7.074	3.551-14.090	
Inequitable Sexual Relationships	0.135	1.145	0.891-1.471	
Long-term school absences (past)	0.720	2.055	0.871-4.848	
School Enrolment (current)				
Enrolled, fee- paying	-1.016*	0.362	0.144-0.908	
Free Schooling	-0.849	0.428	0.181-1.011	

* Denotes significance at $p \leq 0.05$ level. ** Denotes significance at $p \leq 0.01$ level. *** Denotes significance at $p \leq 0.001$. Controlling for age, household poverty and rural/urban residential location.

FIGURE 1 – Hypothesised model explored through mediation analysis

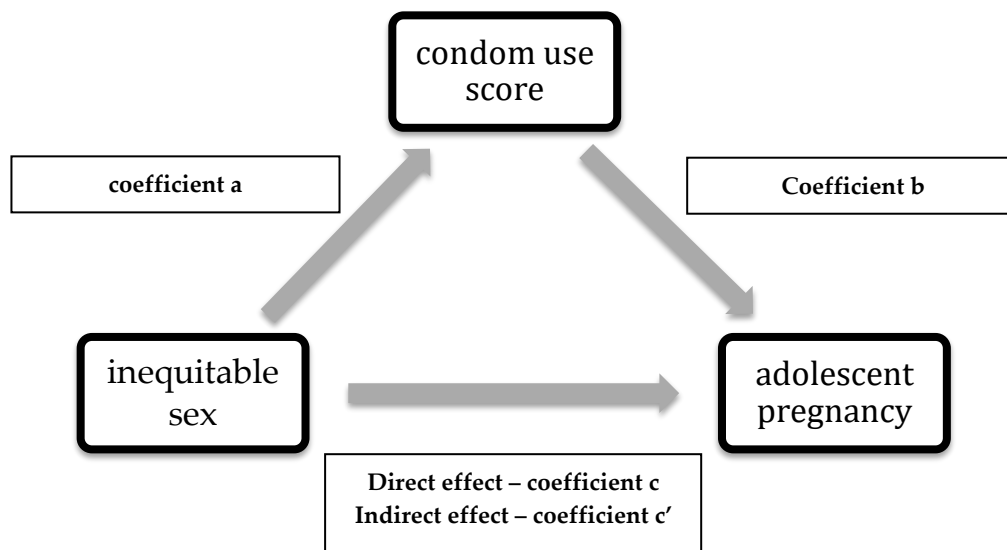


FIGURE 2 – Model for Condom Use Mediating the Relationship between Inequitable Sexual Partnerships and Adolescent Pregnancy

